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LEARNER GUIDE

78965  Further Education and Training Certificate: Information Technology: Systems Development
Credits: 165
NQF LEVEL: 04
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Learner Guide v1 ©ympg

Review Date: June 2014
SECTION A: PROGRAMME/MODULE INFORMATION

1. Introduction
2. Module Introduction
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SECTION A: PROGRAMME/MODULE INFORMATION

1. Introduction

The learning experiences are designed to enable the learners to master the learning content at the appropriate level.

The Learner Pack for this module contains the following documents/prescribed books:
Learner Orientation Guide
Learner Guide
Prescribed Material
Portfolio of Evidence
Logbook

2. Module Introduction

The module introduction with the facilitator will cover:
Overview of the module, including tasks and activities - expectations
Timetable
The Learner Guide
The Learner Portfolio of Evidence
Assessment: The importance of completing all tasks in the PoE; the neat and orderly submission of evidence in the PoE; all forms completed and signed
Exit leaning outcomes Component
The Summative Assessment
Programme Assessment timetable schedule
### 3. Purpose of the Module

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**Quadmester** system divides the academic year into four terms, up to 12 weeks each, and generally counts the summer as one of the terms.

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Dear Learner,

Welcome to this Learning Programme. We trust that this Learning Programme will be of great value to you during your studies and in your future career.

To succeed in anything in life requires a lot of hard work.

It will be expected of you to work through this study guide with a great deal of attention. It provides you with information on how to work through the material, details exactly what will be expected of you and what objectives you need to achieve during the study of this Learning Programme. You will have to:

♦ Complete your assignments with dedication and submit them in time.
♦ Complete the self study sections for your own benefit. The self study sections provide you with the opportunity to practice what you have
## Competencies

### Essential Embedded Knowledge of:
- An understanding of copyright and intellectual property right covered under the laws of South Africa.
- An understanding of basic principles of graphic design.
- An understanding of working to project planning principles.
- An understanding of interfacing with clients to get specifications and approval for the completed project.

### Critical Cross Field Outcomes
- Plan the use of a multimedia/web-based authoring computer application with scripting;
- Design a multimedia/web-based application;
- Identify and save text, graphic elements and animation to be included in the multimedia/web-based application;
- Create multimedia/web-based application scripts; and
- Assemble a multimedia/web-based application including scripts.

The performance of all elements is to a standard that allows further learning in this area.
### UNIT 1 Plan the use of a multimedia/web-based authoring computer application with scripting.

1. **Introduction**: The user-specified topic, purpose, target audience and objectives of the application are identified according to agreed development plan.
2. The tools selected to create multimedia/web-based computer applications with scripting is justified in relation to the agreed development plan.
3. The hardware and software required to create and run the application is identified according to the agreed development plan.
4. The plan for the creation of a multimedia/web-based computer application is outlined and monitored according to project planning principles and financial requirements.
5. The configuration of the computer and associated systems necessary for the creation of the application are identified according to the agreed development plan.

### UNIT 2 Design a multimedia/web-based computer application.

1. **Introduction**: Multimedia/web-based application design is generated according to the user specifications of the multimedia/web-based application. Range: The multimedia/web-based application refers to the user specifications for the topic, purpose, target audience and objectives.
2. Story-board and flow-diagram of the multimedia/web-based computer application is designed to ensure effective communication between developer and user understanding.
3. The multimedia/web-based computer...
application is designed according to effective communication for multimedia/web-based in the application principles.

4. Conclusion

<table>
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<th>UNIT 3 Identify and save text, graphic elements and animation</th>
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1. **Introduction** Multimedia/web-based application text is used to align with agreed topic, purpose and target audience for the application and South African copyright and privacy laws.

2. Graphic elements and animation are identified and saved according to agreed design specification and South African copyright and privacy laws.

3. The text, graphic elements and animation are saved in a form that allows them to be integrated into the multimedia/web-based application.

4. Conclusion

<table>
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<tr>
<th>UNIT 4 Create multimedia/web-based computer application scripts.</th>
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1. **Introduction** A logic diagram of the scripts is demonstrated in the specified outcome

2. The operating environment of the computer and associated applications and software are configured so that it may be used as outlined in the plan.

3. The script is written using standard features of the scripting language.

4. The scripts are tested, errors identified and corrected through most likely conditions.

5. Conclusion
UNIT 5 Assemble a multimedia/web-based application including scripts.

1. **Introduction** The multimedia/web-based application is assembled using the saved text, graphics and animation, written application scripts and planned specification and user requirement.

2. The function and content of the application are consistent with the design specification and specified computer system environment.

3. **Conclusion**
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Plan the use of a multimedia/web-based authoring computer application with scripting.

Unit 1

Unit Outcomes

At the end of this unit you should be able to:

Exit Learning Outcomes:

1. The user-specified topic, purpose, target audience and objectives of the application are identified according to agreed development plan.
2. The tools selected to create multimedia/web-based computer applications with scripting is justified in relation to the agreed development plan.
3. The hardware and software required to create and run the application is identified according to the agreed development plan.
4. The plan for the creation of a multimedia/web-based computer application is outlined and monitored according to project planning principles and financial requirements.
5. The configuration of the computer and associated systems necessary for the creation of the application are identified according to the agreed development plan.

Conclusion
The user-specified topic, purpose, target audience and objectives of the application are identified according to agreed development plan.

What is Internet?

The Internet is essentially a global network of computing resources. You can think about the Internet as a physical collection of routers and circuits as a set of shared resources or even as an attitude about interconnecting and intercommunication. Some common definitions given in the past include:

- A network of networks based on the TCP/IP communications protocol.
- A community of people who use and develop those networks.
- A community of people who use and develop those networks.

Internet Based Services:

Some of the basic services available to Internet users are:

- **Email**: A fast, easy, and inexpensive way to communicate with other Internet users around the world.

- **Telnet**: Allows a user to log into a remote computer as though it were a local system.

- **FTP**: Allows a user to transfer virtually every kind of file that can be stored on a computer from one Internet-connected computer to another.

- **Usenetnews**: A distributed bulletin board that offers a combination news and discussion service on thousands of topics.
- **World Wide Web (WWW):** A hypertext interface to Internet information resources.

**What is WWW?**

This stands for **World Wide Web.** A technical definition of the World Wide Web is: all the resources and users on the Internet that are using the Hypertext Transfer Protocol (HTTP).

A broader definition comes from the organization that Web inventor Tim Berners-Lee helped found, the World Wide Web Consortium (W3C):

The World Wide Web is the universe of network-accessible information, an embodiment of human knowledge.

In simple terms, The World Wide Web is a way of exchanging information between computers on the Internet, tying them together into a vast collection of interactive multimedia resources.

**What is HTTP?**

This stands for **HyperText Transfer Protocol.** This is the protocol being used to transfer hypertext documents that makes the *World World Wide* possible.

A standard web address such as `http://www.yahoo.com/` is called a URL and here the prefix `http` indicates its protocol.

**What is URL?**

URL stands for **Uniform Resource Locator,** and is used to specify addresses on the World Wide Web. A URL is the fundamental network identification for any resource connected to the web (e.g., hypertext pages, images, and sound files).

A URL will have the following format:
The protocol specifies how information from the link is transferred. The protocol used for web resources is HyperText Transfer Protocol (HTTP). Other protocols compatible with most web browsers include FTP, telnet, newsgroups, and Gopher.

The protocol is followed by a colon, two slashes, and then the domain name. The domain name is the computer on which the resource is located.

Links to particular files or subdirectories may be further specified after the domain name. The directory names are separated by single forward slashes.

What is Website?

Currently you are on our website http://www.tutorialspoint.com which is a collection of various pages written in HTML markup language. This is a location on the web where people can find tutorials on latest technologies. Similar way there are millions of websites available on the web.

Each page available on the Website is called a web page and first page of any web site is called home page for that site.

What is Web Server?

Every Web site sits on a computer known as a Web server. This server is always connected to the internet. Every Web server that is connected to the Internet is given a unique address made up of a series of four numbers between 0 and 256 separated by periods for example, 68.178.157.132 or 68.122.35.127.

When you register a Web address, also known as a domain name, such as tutorialspoint.com you have to specify the IP address of the Web server that will host the site.

We will see different type of Web servers in a separate chapter.

What is Web Browser?
Web Browsers are software installed on your PC. To access the Web you need a web browsers, such as Netscape Navigator, Microsoft Internet Explorer or Mozilla Firefox.

Currently you must be using any sort of Web browser while you are navigating through my site tutorialspoint.com. On the Web, when you navigate through pages of information this is commonly known as **browsing or surfing**.

We will see different type of Web browsers in a separate chapter.

**What is SMTP Server?**

This stands for **Simple Mail Transfer Protocol Server**. This server takes care of delivering emails from one server to another server. When you send an email to an email address, it is delivered to its recipient by a SMTP Server.

**What is ISP?**

This stands for **Internet Service Provider**. They are the companies who provide you service in terms of internet connection to connect to the internet.

You will buy space on a Web Server from any Internet Service Provider. This space will be used to host your Web site.

**What is HTML?**

This stands for **HyperText Markup Language**. This is the language in which we write web pages for any Website. Even the page you are reading right now is written in HTML.

This is a subset of Standard Generalized Mark-Up Language (SGML) for electronic publishing, the specific standard used for the World Wide Web.

**What is Hyperlink?**

A hyperlink or simply a link is a selectable element in an electronic document that serves as an access point to other electronic resources. Typically, you click the hyperlink to access the linked resource. Familiar hyperlinks include buttons, icons, image maps, and clickable text links.

What is DNS ?
DNS stands for **Domain Name System**. When someone types in your domain name, www.example.com, your browser will ask the Domain Name System to find the IP that hosts your site. When you register your domain name, your IP address should be put in a DNS along with your domain name. Without doing it your domain name will not be functioning properly.

**What is W3C?**

This stands for **World Wide Web Consortium** which is an international consortium of companies involved with the Internet and the Web.

The W3C was founded in 1994 by Tim Berners-Lee, the original architect of the World Wide Web. The organization's purpose is to develop open standards so that the Web evolves in a single direction rather than being splintered among competing factions. The W3C is the chief standards body for HTTP and HTML.

On the simplest level, the Web physically consists of following components:

- **Your personal computer** - This is the PC at which you sit to see the web.

- **A Web browser** - A software installed on your PC which helps you to browse the Web.

- **An internet connection** - This is provided by an ISP and connects you to the internet to reach to any Web site.
• **A Web server** - This is the computer on which a web site is hosted.

• **Routers & Switches** - They are the combination of software and hardware who take your request and pass to appropriate Web server.

The Web is known as a *client-server* system. Your computer is the client and the remote computers that store electronic files are the servers.

Here’s how web works:

When you enter something like http://www.google.com, the request goes to one of many special computers on the Internet known as *Domain Name Servers (DNS)*. All these requests are routed through various routers and switches. The domain name servers keep tables of machine names and their IP addresses, so when you type in http://www.google.com, it gets translated into a number, which identifies the computers that serve the Google Web site to you.

When you want to view any page on the Web, you must initiate the activity by requesting a page using your browser. The browser asks a domain name server to translate the domain name you requested into an IP address. The browser then sends a request to that server for the page you want, using a standard called Hypertext Transfer Protocol or HTTP.

The server should constantly be connected to the Internet Ready to serve pages to visitors. When it receives a request, it looks for the requested document and returns it to the Web browser. When a request is made, the server usually logs the client’s IP address, the document requested, and the date and time it was requested. This information varies server to server.

An average Web page actually requires the Web browser to request more than one file from the Web server and not just the HTML / XHTML page, but also any images, style sheets, and other resources used in the web page. Each of these files including the main page needs a URL to identify each item. Then each item is sent by the Web server to the Web browser and Web browser collects all this information and displays them in the form of Web page.
In short:

We have seen how a Web client - server interaction happens. We can summaries these steps as follows:

- A user enters a URL into a browser (for example, http://www.google.com). This request is passed to a domain name server.

- The domain name server returns an IP address for the server that hosts the Web site (for example, 68.178.157.132).

- The browser requests the page from the Web server using the IP address specified by the domain name server.

- The Web server returns the page to the IP address specified by the browser requesting the page. The page may also contain links to other files on the same server, such as images, which the browser will also request.

- The browser collects all the information and displays to your computer in the form of a Web page.

**Assessment criteria**

| 1.3 | The hardware and software required to create and run the application is identified according to the agreed development plan. |

**What is SEO?**

**Search Engine Optimization** refers to set of activities that are performed to increase number of desirable visitors who come to your site via search engine. These activities may include thing you do to your site itself, such as making changes to your text and HTML code, formatting text or document to communicate directly to the search engine.
Types of SEO

SEO can be classified into two types: **White Hat SEO** and **Black Hat or Spamdexing**

**WHITE HAT SEO**

An SEO tactic, technique or method is considered as **White Hat** if it follows the followings:

- If it conforms to the search engine’s guidelines.
- If it does not involves any deception.
- It ensures that the content a search engine indexes and subsequently ranks is the same content a user will see.
- It ensures that a Web Page content should have been created for the users and not just for the search engines.
- It ensures the good quality of the web pages.
- It ensures the useful content available on the web pages.

Always follow a White Hat SEO tactic and don't try to fool your site visitors. Be honest and definitely you will get something more.

**BLACK HAT OR SPAMDEXING:**

An SEO tactic, technique or method is considered as Black Hat or Spamdexing if it follows the followings:

- Try to improve rankings that are disapproved of by the search engines and/or involve deception.
- Redirecting users from a page that is built for search engines to one that is more human friendly.
- Redirecting users to a page that was different from the page the search engine ranked.
- Serving one version of a page to search engine spiders/bots and another version to human visitors. This is called **Cloaking SEO** tactic.
• Using Hidden or invisible text or with the page background color, using a tiny font size or hiding them within the HTML code such as "no frame" sections.

• Repeating keywords in the Meta tags, and using keywords that are unrelated to the site's content. This is called **Meta tag stuffing**.

• Calculated placement of keywords within a page to raise the keyword count, variety, and density of the page. This is called **Keyword stuffing**.

• Creating low-quality web pages that contain very little content but are instead stuffed with very similar keywords and phrases. These pages are called **Doorway or Gateway Pages**

• **Mirror web sites** by hosting multiple web sites all with conceptually similar content but using different URLs.

• Mirror web sites by hosting multiple web sites all with conceptually similar content but using different URLs.

• Creating a rogue copy of a popular web site which shows contents similar to the original to a web crawler, but redirects web surfers to unrelated or malicious web sites. This is called **Page hijacking**.

**Key Elements to ethical SEO**

**Keyword research**

It allows you to see which keywords users actually employ to find products and services within your chosen market, instead of making guesses at the keywords you believe are the most popular.

**Content development**

**Content development involves:**

• Navigational flow and menu structure

• Site copy or articles

• Headings and sections
Web development

Web development involves:

- Text-based site development wherever possible.

- Clean and logical site structure.

- Proper markup of key page elements.

**Link Building**

Building links will make up about 60% of your work. There are ways to automate this process using shortcuts, workarounds, and submission services.

**Internal linking** is also very important. Treat the way you link to your own content same as you would link from an external site.

**Webmaster Tools**

**Webmaster dashboard** is provided by both Google and Bing that gives insight into activity by the search engine on any site that has been registered and verified via dashboard.

Dashboards offer a number of tools which allow us to understand how the search engine sees your site. These are the only way to identify crawling, indexing, and the ranking issue with your site.

**SEO Do's and Do'nts**

**DO's**

There are various other tips which can help you to optimize your web site for many Search Engines:

- Create logs of pages and each page should however contain a minimum of about 200 visible words of text to maximize relevance with Google.

- Create a Sitemap, Help, FAQ, About Us, Link to Us, Copyright, Disclaimer, and Privacy Policy pages on mandatory basis.

- Create a home page link to each and every web page and provide easy navigation through all the pages.

- Pay attention to your dynamic page URLs. Google can crawl and index dynamic pages as long as you don’t have more than 2 parameters in the URL.
• Check your complete site for broken links. Broken links will reduce your other pages rank as well.

Don’ts
Here is the list of Do’nts that one should keep in mind all the times:
• Don’t keep hidden text on your web pages.
• Don’t create alt image spamming by putting wrong keywords.
• Don’t use Meta tags stuffing.
• Don’t use frames and flash on your site.
• Don’t exchange your links with black listed sites.
• Don’t try to fool your site visitors by using miss spelled keywords.
• Don’t send spam emails to thousands of email IDs.
• Don’t use too much graphics on your site.
• Don’t create too many doorway pages.
• Don’t try to create duplicate content of pages.
• Don’t submit your website many times in a single search engine.
• Don’t use sub-directory depth more than 1-2.
• Don’t create too many dynamic pages. Try to convert them into static pages.
• Don’t bloat your pages with code.
• Don’t nest your pages.
The plan for the creation of a multimedia/web-based computer application is outlined and monitored according to project planning principles and financial requirements.

Website monetization refers to making money from the website. It is done by converting existing traffic to a particular website into revenue.

Methods of Monetization

Display Advertising
It refers to the banners and text ads. This method is good for the websites that have significant traffic, valuable audience, relevant and active advertisers.

Affiliate Marketing
It refers to steering the visitors to products and services of a third party merchant. It is good for the websites that are product centric and have easy integration into content.

Lead generation
It refers to capturing the customer information and selling it to a third party.

Email rental
It refers to renting out your email lists to third parties. In this you will send an email on their behalf to your distribution list.
The configuration of the computer and associated systems necessary for the creation of the application are identified according to the agreed development plan.

Web Browsers are software installed on your PC. To access the Web you need a web browsers, such as Netscape Navigator, Microsoft Internet Explorer or Mozilla Firefox.

Currently you must be using any sort of Web browser while you are navigating through my site tutorialspoint.com. On the Web, when you navigate through pages of information this is commonly known as web browsing or web surfing.

There are four leading web browsers: Explorer, FireFox, Netscape and Safari but there are many others browsers available. You might be interested in knowing Complete Browser Statistics. Now we will see these browsers in bit more detail.

While developing a site, we should try to make it compatible to as many browsers as possible. Specially site should be compatible to major browsers like Explorer, FireFox, Netscape, Opera and Safari.

Internet Explorer

Internet Explorer (IE) is a product from software giant Microsoft. This is the most commonly used browser in the universe. This was introduced in 1995 along with Windows 95 launch and it has passed Netscape popularity in 1998.

You can download latest version of this browser from Microsoft site Download Internet Explorer
Netscape

Netscape is one of the original Web browsers. This is what Microsoft designed Internet Explorer to compete against. Netscape and IE comprise the major portion of the browser market. Netscape was introduced in 1994.

You can download latest copy of this browser from Download Netscape

Mozilla

Mozilla is an open-source Web browser, designed for standards compliance, performance and portability. The development and testing of the browser is coordinated by providing discussion forums, software engineering tools, releases and bug tracking. Browsers based on Mozilla code is the second largest browser family on the Internet today, representing about 30% of the Internet community.

You can download latest copy of this browser from Download Mozilla

Konqueror

Konqueror is an Open Source web browser with HTML 4.01 compliance, supporting Java applets, JavaScript, CSS 1, CSS 2.1, as well as Netscape plugins. This works as a file manager as wellIt supports basic file management on local UNIX filesystems, from simple cut/copy and paste operations to advanced remote and local network file browsing.

You can download latest copy of this browser from Download Konqueror

Firefox

Firefox is a new browser derived from Mozilla. It was released in 2004 and has grown to be the second most popular browser on the Internet.

You can download a latest version of this browser from Download Firefox
Safari

Safari is a web browser developed by Apple Inc. and included in Mac OS X. It was first released as a public beta in January 2003. Safari has very good support for latest technologies like XHTML, CSS2 etc.

You can download a latest version of this browser from Download Safari

Opera

Opera is smaller and faster than most other browsers, yet it is full-featured. Fast, user-friendly, with keyboard interface, multiple windows, zoom functions, and more. Java and non-Java-enabled versions available. Ideal for newcomers to the Internet, school children, handicap and as a front-end for CD-ROM and kiosks.

You can download a latest version of this browser from Download Opera

Lynx

Lynx is a fully-featured World Wide Web browser for users on Unix, VMS, and other platforms running cursor-addressable, character-cell terminals or emulators.

You can download a latest version of this browser from Download Lynx
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<td>Answers:</td>
<td></td>
</tr>
<tr>
<td>CCFO</td>
<td>DEMONSTRATING</td>
</tr>
<tr>
<td>Marks</td>
<td>10</td>
</tr>
<tr>
<td>Project</td>
<td>Group Activity: 1.2</td>
</tr>
<tr>
<td>---------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Instructions</td>
<td>Create tools selected to multimedia/web-based computer applications with scripting justified in relation to the agreed development plan</td>
</tr>
<tr>
<td>CCFO</td>
<td>COMMUNICATING</td>
</tr>
<tr>
<td>Method</td>
<td>Group Activity</td>
</tr>
<tr>
<td>Answers:</td>
<td></td>
</tr>
<tr>
<td>Media Method</td>
<td>Flipchart</td>
</tr>
<tr>
<td>Research PROJECT</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>--</td>
</tr>
<tr>
<td>Activity: 1.3</td>
<td></td>
</tr>
<tr>
<td>Instructions</td>
<td>Create and identify hardware and software required to run the application according to the agreed development plan.</td>
</tr>
<tr>
<td>CCFO</td>
<td>Collecting</td>
</tr>
<tr>
<td>Method</td>
<td>Group Activity</td>
</tr>
<tr>
<td>Media Method</td>
<td>Flipchart</td>
</tr>
<tr>
<td>Answers</td>
<td></td>
</tr>
</tbody>
</table>
### Simulation

#### ACTIVITY 1.1

<table>
<thead>
<tr>
<th>Instructions</th>
<th>Create plan for the multimedia/web-based computer application outlined and monitored according to project planning principles and financial requirements.</th>
</tr>
</thead>
</table>

**CCFO**

**Organising**

**Method**

Group Activity

**Media Method**

Flipchart

**Mark**

10

**Answer:**
Take some time to reflect on what you have learnt in this module and assess your knowledge against the following pointers. Write down your answers. Should you not be able to complete each of these statements, go back to your notes and check on your understanding? You can also discuss the answers with a colleague.

How do you Plan the use of a multimedia/web-based authoring computer application with scripting?
Unit 2

Unit Outcomes

At the end of this unit you should be able to:

Learning Outcomes:

1. Introduction Multimedia/web-based application design is generated according to the user specifications of the multimedia/web-based application. Range: The multimedia/web-based application refers to the user specifications for the topic, purpose, target audience and objectives.

2. Story-board and flow-diagram of the multimedia/web-based computer application is designed to ensure effective communication between developer and user understanding.

3. The multimedia/web-based computer application is designed according to effective communication for multimedia/web-based in the application principles.

Conclusion
### Assessment criteria

| 2.1 | Story-board and flow-diagram of the multimedia/web-based computer application is designed to ensure effective communication between developer and user understanding. |

WWW stands for World Wide Web. A technical definition of the World Wide Web is: all the resources and users on the Internet that are using the Hypertext Transfer Protocol (HTTP).

A broader definition comes from the organization that Web inventor Tim Berners-Lee helped found, the World Wide Web Consortium (W3C).

The World Wide Web is the universe of network-accessible information, an embodiment of human knowledge.

In simple terms, The World Wide Web is a way of exchanging information between computers on the Internet, tying them together into a vast collection of interactive multimedia resources.

Internet and Web is not the same thing: Web uses internet to pass over the information.
Evolution

World Wide Web was created by Timothy Berners Lee in 1989 at CERN in Geneva. World Wide Web came into existence as a proposal by him, to allow researchers to work together effectively and efficiently at CERN. Eventually it became World Wide Web.

The following diagram briefly defines evolution of World Wide Web:

WWW Architecture

WWW architecture is divided into several layers as shown in the following diagram:
Identifiers and Character Set

**Uniform Resource Identifier (URI)** is used to uniquely identify resources on the web and **UNICODE** makes it possible to build web pages that can be read and written in human languages.

**Syntax**

**XML (Extensible Markup Language)** helps to define common syntax in semantic web.

**Data Interchange**

**Resource Description Framework (RDF)** framework helps in defining core representation of data for web. RDF represents data about resource in graph form.

**Taxonomies**

**RDF Schema (RDFS)** allows more standardized description of **taxonomies** and other **ontological** constructs.
Ontologies

**Web Ontology Language (OWL)** offers more constructs over RDFS. It comes in following three versions:

- OWL Lite for taxonomies and simple constraints.
- OWL DL for full description logic support.
- OWL for more syntactic freedom of RDF

Rules

**RIF** and **SWRL** offers rules beyond the constructs that are available from **RDFs** and **OWL**.

Simple Protocol and **RDF Query Language (SPARQL)** is SQL like language used for querying RDF data and OWL Ontologies.

Proof

All semantic and rules that are executed at layers below Proof and their result will be used to prove deductions.

Cryptography

**Cryptography** means such as digital signature for verification of the origin of sources is used.

User Interface and Applications

On the top of layer **User interface and Applications** layer is built for user interaction.
The multimedia/web-based computer application is designed according to effective communication for multimedia/web-based in the application principles.

### WWW Operation

**WWW** works on client-server approach. Following steps explains how the web works:

1. User enters the URL (say, [http://www.tutorialspoint.com](http://www.tutorialspoint.com)) of the web page in the address bar of web browser.

2. Then browser requests the Domain Name Server for the IP address corresponding to www.tutorialspoint.com.

3. After receiving IP address, browser sends the request for web page to the web server using HTTP protocol which specifies the way the browser and web server communicates.

4. Then web server receives request using HTTP protocol and checks its search for the requested web page. If found it returns it back to the web browser and close the HTTP connection.

5. Now the web browser receives the web page, it interprets it and display the contents of web page in web browser’s window.
Future

There had been a rapid development in field of web. It has its impact in almost every area such as education, research, technology, commerce, marketing etc. So the future of web is almost unpredictable.

Apart from huge development in field of WWW, there are also some technical issues that W3 consortium has to cope up with.

User Interface
Work on higher quality presentation of 3-D information is under development. The W3 Consortium is also looking forward to enhance the web to full fill requirements of global communities which would include all regional languages and writing systems.

Technology
Work on privacy and security is under way. This would include hiding information, accounting, access control, and integrity and risk management.

Architecture
There has been huge growth in field of web which may lead to overload the internet and degrade its performance. Hence better protocol are required to be developed.

Formative assessment
### Role play

#### Activity: 1.4

<table>
<thead>
<tr>
<th>Instructions</th>
<th>Which Multimedia/web-based application design is generated according to the user specifications of the multimedia/web-based application and which multimedia/web-based application refers to the user specifications for the topic, purpose, target audience and objectives?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method</td>
<td>Individual Activity</td>
</tr>
<tr>
<td>Media Method</td>
<td>Flipchart</td>
</tr>
<tr>
<td>Answers:</td>
<td></td>
</tr>
<tr>
<td>CCFO</td>
<td>DEMONSTRATING</td>
</tr>
<tr>
<td>Marks</td>
<td>10</td>
</tr>
</tbody>
</table>

### Project

#### Group Activity: 1.5

<p>| Instructions                                                                 | Which Story-board and flow-diagram of the multimedia/web-based computer application is designed to ensure effective |</p>
<table>
<thead>
<tr>
<th>CCFO</th>
<th>COMMUNICATING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Method</strong></td>
<td>Group Activity</td>
</tr>
<tr>
<td><strong>Answers:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Media Method</strong></td>
<td>Flipchart</td>
</tr>
<tr>
<td>Research PROJECT</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>Activity: 1.6</td>
<td></td>
</tr>
</tbody>
</table>

**Instructions**
Which multimedia/web-based computer application is designed according to effective communication for multimedia/web-based in the application principles?

**CCFO**
Collecting

**Method**
Group Activity

**Media Method**
Flipchart

**Answers**
Essay

Take some time to reflect on what you have learnt in this module and assess your knowledge against the following pointers. Write down your answers. Should you not be able to complete each of these statements, go back to your notes and check on your understanding? You can also discuss the answers with a colleague.

How do you Design a multimedia/web-based computer application?

Identify and save text, graphic elements and animation
Unit Outcomes

At the end of this unit you should be able to:

Exit Learning Outcomes:

1. **Introduction** Multimedia/web-based application text is used to align with agreed topic, purpose and target audience for the application and South African copyright and privacy laws.

2. Graphic elements and animation are identified and saved according to agreed design specification and South African copyright and privacy laws.

3. The text, graphic elements and animation are saved in a form that allows them to be integrated into the multimedia/web-based application.

4. **Conclusion**
Multimedia/web-based application text is used to align with agreed topic, purpose and target audience for the application and South African copyright and privacy laws.

Web Page

Web page is a document available on World Wide Web. Web Pages are stored on web server and can be viewed using a web browser.

A web page can contain huge information including text, graphics, audio, video and hyperlinks. These hyperlinks are the link to other web pages.

Collection of linked web pages on a web server is known as website. There is unique Uniform Resource Locator (URL) is associated with each web page.

Static Web page

Static web pages are also known as flat or stationary web page. They are loaded on the client’s browser as exactly they are stored on the web server. Such web pages contain only static information. User can only read the information but can’t do any modification or interact with the information.

Static web pages are created using only HTML. Static web pages are only used when the information is no more required to be modified.
Dynamic Web page

**Dynamic web page** shows different information at different point of time. It is possible to change a portion of a web page without loading the entire web page. It has been made possible using **Ajax** technology.

**SERVER-SIDE DYNAMIC WEB PAGE**

It is created by using server-side scripting. There are server-side scripting parameters that determine how to assemble a new web page which also include setting up of more client-side processing.

**CLIENT-SIDE DYNAMIC WEB PAGE**

It is processed using client side scripting such as JavaScript. And then passed in to **Document Object Model (DOM)**.

**Scripting Languages**

Scripting languages are like programming languages that allow us to write programs in form of script. These scripts are interpreted not compiled and executed line by line.
Scripting language is used to create dynamic web pages.

**Client-side Scripting**

**Client-side scripting** refers to the programs that are executed on client-side. Client-side scripts contain the instruction for the browser to be executed in response to certain user’s action.

Client-side scripting programs can be embedded into HTML files or also can be kept as separate files.
Following table describes commonly used Client-Side scripting languages:

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Scripting Language</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>JavaScript</strong></td>
<td>It is a prototype based scripting language. It inherits its naming conventions from java. All java script files are stored in file having <code>.js</code> extension.</td>
</tr>
<tr>
<td>2.</td>
<td><strong>ActionScript</strong></td>
<td>It is an object oriented programming language used for the development of websites and software targeting Adobe flash player.</td>
</tr>
<tr>
<td>3.</td>
<td><strong>Dart</strong></td>
<td>It is an open source web programming language developed by Google. It relies on source-to-source compiler to JavaScript.</td>
</tr>
<tr>
<td>4.</td>
<td><strong>VBScript</strong></td>
<td>It is an open source web programming language developed by Microsoft. It is superset of JavaScript and adds optional static typing class-based object oriented programming.</td>
</tr>
</tbody>
</table>
Graphic elements and animation are identified and saved according to agreed design specification and South African copyright and privacy laws.

Server-side Scripting

Server-side scripting acts as an interface for the client and also limit the user access the resources on web server. It can also collects the user’s characteristics in order to customize response.
Following table describes commonly used Server-Side scripting languages:

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Scripting Language Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>ASP</strong>&lt;br&gt;Active Server Pages (ASP) is server-side script engine to create dynamic web pages. It supports <strong>Component Object Model (COM)</strong> which enables ASP web sites to access functionality of libraries such as DLL.</td>
</tr>
<tr>
<td>2.</td>
<td><strong>ActiveVFP</strong>&lt;br&gt;It is similar to PHP and also used for creating dynamic web pages. It uses native <strong>Visual Foxpro</strong> language and database.</td>
</tr>
<tr>
<td>3.</td>
<td><strong>ASP.net</strong>&lt;br&gt;It is used to develop dynamic websites, web applications, and web services.</td>
</tr>
<tr>
<td>4.</td>
<td><strong>Java</strong>&lt;br&gt;Java Server Pages are used for creating dynamic web applications. The Java code is compiled into byte code and run by <strong>Java Virtual Machine (JVM)</strong>.</td>
</tr>
<tr>
<td>5.</td>
<td><strong>Python</strong>&lt;br&gt;It supports multiple programming paradigms such as object-oriented, and functional programming. It can also be used as non-scripting language using third party tools such as <strong>Py2exe</strong> or <strong>Pyinstaller</strong>.</td>
</tr>
<tr>
<td>6.</td>
<td><strong>WebDNA</strong>&lt;br&gt;It is also a server-side scripting language with an embedded database system.</td>
</tr>
</tbody>
</table>
The text, graphic elements and animation are saved in a form that allows them to be integrated into the multimedia/web-based application.

Web Browser

**Web Browser** is an application software that allows us to view and explore information on the web. User can request for any web page by just entering a URL into address bar.

Web browser can show text, audio, video, animation and more. It is the responsibility of a web browser to interpret text and commands contained in the web page.

Earlier the web browsers were text-based while now a days graphical-based or voice-based web browsers are also available. Following are the most common web browser available today:

<table>
<thead>
<tr>
<th>Browser</th>
<th>Vendor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Explorer</td>
<td>Microsoft</td>
</tr>
<tr>
<td>Google Chrome</td>
<td>Google</td>
</tr>
<tr>
<td>Mozilla Firefox</td>
<td>Mozilla</td>
</tr>
<tr>
<td>Netscape Navigator</td>
<td>Netscape Communications Corp.</td>
</tr>
<tr>
<td>Opera</td>
<td>Opera Software</td>
</tr>
<tr>
<td>Safari</td>
<td>Apple</td>
</tr>
</tbody>
</table>
Architecture

There are a lot of web browser available in the market. All of them interpret and display information on the screen however their capabilities and structure varies depending upon implementation. But the most basic component that all web browser must exhibit are listed below:

- **Controller/Dispatcher**
- **Interpreter**
- **Client Programs**

**Controller** works as a control unit in CPU. It takes input from the keyboard or mouse, interpret it and make other services to work on the basis of input it receives.

**Interpreter** receives the information from the controller and execute the instruction line by line. Some interpreter are mandatory while some are optional For example, HTML interpreter program is mandatory and java interpreter is optional.

**Client Program** describes the specific protocol that will be used to access a particular service. Following are the client programs that are commonly used:

- HTTP
- SMTP
- FTP
- NNTP
- POP
Starting Internet Explorer

Internet explorer is a web browser developed by Microsoft. It is installed by default with the windows operating system however, it can be downloaded and be upgraded.

To start internet explorer, follow the following steps:

- Go to **Start** button and click **Internet Explorer**.
The **Internet Explorer** window will appear as shown in the following diagram:
Accessing Web Page
Accessing web page is very simple. Just enter the URL in the address bar as shown the following diagram:

![Image of a web browser accessing a web page]

Navigation
A web page may contain hyperlinks. When we click on these links other web page is opened. These hyperlinks can be in form of text or image. When we take the mouse over an hyperlink, pointer change its shape to hand.
Key Points

- In case, you have accessed many web pages and willing to see the previous webpage then just click back button.

- You can open a new web page in the same tab, or different tab or in a new window.

Saving Webpage

You can save web page to use in future. In order to save a webpage, follow the steps given below:

- Click File > Save As. Save Webpage dialog box appears.

- Choose the location where you want to save your webpage from save in: list box. Then choose the folder where you want to save the webpage.

- Specify the file name in the File name box.

- Select the type from Save as type list box.
  
  - Webpage, complete
  
  - Web Archive
  
  - Webpage HTML only
- Text File

- From the **encoding** list box, choose the character set which will be used with your webpage. By default, **Western European** is selected.

- Click **save** button and the webpage is saved.
# Formative assessment

<table>
<thead>
<tr>
<th>Role play</th>
<th>Activity: 1.7</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instructions</strong></td>
<td>Which Multimedia/web-based application text is used to align with agreed topic, purpose and target audience for the application and South African copyright and privacy law?</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>Individual Activity</td>
</tr>
<tr>
<td><strong>Media Method</strong></td>
<td>Flipchart</td>
</tr>
<tr>
<td><strong>Answers:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CCFO</strong></td>
<td>DEMONSTRATING</td>
</tr>
<tr>
<td><strong>Marks</strong></td>
<td>10</td>
</tr>
<tr>
<td>Project</td>
<td>Group Activity: 1.8</td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Instructions</td>
<td>Identify Graphic elements and animation saved according to agreed design specification and South African copyright and privacy laws.</td>
</tr>
<tr>
<td>CCFO</td>
<td>COMMUNICATING</td>
</tr>
<tr>
<td>Method</td>
<td>Group Activity</td>
</tr>
<tr>
<td>Answers:</td>
<td></td>
</tr>
<tr>
<td>Media Method</td>
<td>Flipchart</td>
</tr>
</tbody>
</table>
**Research PROJECT**

**Activity: 1.9**

<table>
<thead>
<tr>
<th>Instructions</th>
<th>Which text, graphic elements and animation are saved in a form that allows them to be integrated into the multimedia/web-based application?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CCFO</strong></td>
<td>Collecting</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>Group Activity</td>
</tr>
<tr>
<td><strong>Media Method</strong></td>
<td>Flipchart</td>
</tr>
<tr>
<td></td>
<td>Answers</td>
</tr>
</tbody>
</table>
Essay

Take some time to reflect on what you have learnt in this module and assess your knowledge against the following pointers. Write down your answers. Should you not be able to complete each of these statements, go back to your notes and check on your understanding? You can also discuss the answers with a colleague.

How do you identify and save text, graphic elements and animation?

Create multimedia/web-based computer application scripts.
Unit 4

Unit Outcomes

At the end of this unit you should be able to:

Exit Learning Outcomes:

1. A logic diagram of the scripts is demonstrated in the specified outcome
2. The operating environment of the computer and associated applications and software are configured so that it may be used as outlined in the plan.
3. The script is written using standard features of the scripting language.
4. The scripts are tested, errors identified and corrected through most likely conditions.

Conclusion
Logic gates are the basic building blocks of any digital system. It is an electronic circuit having one or more than one input and only one output. The relationship between the input and the output is based on a certain logic. Based on this logic gates are named as AND gate, OR gate, NOT gate etc.

**AND Gate**

A circuit which performs an AND operation is shown in figure. It has n input (n >= 2) and one output.

\[
Y = \text{A AND B AND C \ldots \ldots N} \\
Y = \text{A.B.C \ldots \ldots N} \\
Y = \text{ABC \ldots \ldots N}
\]

**LOGIC DIAGRAM**

![Logic Diagram](image)

**TRUTH TABLE**

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
OR Gate

A circuit which performs an OR operation is shown in figure. It has n input (n >= 2) and one output.

\[
Y = A \text{ OR } B \text{ OR } C \ldots \text{ N} \\
Y = A + B + C \ldots \text{ N}
\]

LOGIC DIAGRAM

![OR Gate Diagram]

TRUTH TABLE

<table>
<thead>
<tr>
<th>Inputs A B</th>
<th>Output A + B</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 0</td>
<td>0</td>
</tr>
<tr>
<td>0 1</td>
<td>1</td>
</tr>
<tr>
<td>1 0</td>
<td>1</td>
</tr>
<tr>
<td>1 1</td>
<td>1</td>
</tr>
</tbody>
</table>

NOT Gate

NOT gate is also known as Inverter. It has one input A and one output Y.

\[
Y = \text{ NOT } A \\
Y = \overline{A}
\]

LOGIC DIAGRAM

![NOT Gate Diagram]

TRUTH TABLE
NAND Gate

A NOT-AND operation is known as NAND operation. It has \( n \) input (\( n \geq 2 \)) and one output.

\[
\begin{align*}
Y &= \text{A NOT AND B NOT AND C} \ldots \ldots \text{N} \\
Y &= \text{A NAND B NAND C} \ldots \ldots \text{N}
\end{align*}
\]

LOGIC DIAGRAM

TRUTH TABLE

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

NOR Gate

A NOT-OR operation is known as NOR operation. It has \( n \) input (\( n \geq 2 \)) and one output.

\[
\begin{align*}
Y &= \text{A NOT OR B NOT OR C} \ldots \ldots \text{N} \\
Y &= \text{A NOR B NOR C} \ldots \ldots \text{N}
\end{align*}
\]

LOGIC DIAGRAM
TRUTH TABLE

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

XOR Gate

XOR or Ex-OR gate is a special type of gate. It can be used in the half adder, full adder and subtractor. The exclusive-OR gate is abbreviated as EX-OR gate or sometime as X-OR gate. It has n input (n >= 2) and one output.

\[
\begin{align*}
Y & = A \oplus B \oplus C \ldots \oplus N \\
Y & = A \oplus B \oplus C \ldots \oplus N \\
Y & = AB + AB
\end{align*}
\]

LOGIC DIAGRAM

XNOR Gate

XNOR gate is a special type of gate. It can be used in the half adder, full adder and subtractor. The exclusive-NOR gate is abbreviated as EX-NOR gate or sometime as X-NOR gate. It has n input (n >= 2) and one output.

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Y = A XOR B XOR C ...... N
Y = A ⊕ B ⊕ C ...... N
Y = A B + AB

LOGIC DIAGRAM

A
B

Y

TRUTH TABLE

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

The operating environment of the computer and associated applications and software are configured so that it may be used as outlined in the plan.
Combinational circuit is circuit in which we combine the different gates in the circuit for example encoder, decoder, multiplexer and demultiplexer. Some of the characteristics of combinational circuits are following.

- The output of combinational circuit at any instant of time, depends only on the levels present at input terminals.
- The combinational circuit do not use any memory. The previous state of input does not have any effect on the present state of the circuit.
- A combinational circuit can have a n number of inputs and m number of outputs.

**BLOCK DIAGRAM**

![Block Diagram](image)

We're going to elaborate few important combinational circuits as follows.

**Half Adder**

Half adder is a combinational logic circuit with two input and two output. The half adder circuit is designed to add two single bit binary number A and B. It is the basic building block for addition of two single bit numbers. This circuit has two outputs carry and sum.

**BLOCK DIAGRAM**

![Block Diagram](image)

**TRUTH TABLE**
Full Adder

Full adder is developed to overcome the drawback of Half Adder circuit. It can add two one-bit numbers A and B, and carry c. The full adder is a three input and two output combinational circuit.

TRUTH TABLE

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
N-Bit Parallel Adder

The Full Adder is capable of adding only two single digit binary number along with a carry input. But in practical we need to add binary numbers which are much longer than just one bit. To add two n-bit binary numbers we need to use the n-bit parallel adder. It uses a number of full adders in cascade. The carry output of the previous full adder is connected to carry input of the next full adder.

4 BIT PARALLEL ADDER

In the block diagram, A₀ and B₀ represent the LSB of the four bit words A and B. Hence Full Adder-0 is the lowest stage. Hence its Cᵢ has been permanently made 0. The rest of the
connections are exactly same as those of n-bit parallel adder is shown in fig. The four bit parallel adder is a very common logic circuit.

**BLOCK DIAGRAM**

![N-Bit Parallel Subtractor](image)

**N-Bit Parallel Subtractor**

The subtraction can be carried out by taking the 1’s or 2’s complement of the number to be subtracted. For example we can perform the subtraction \((A - B)\) by adding either 1’s or 2’s complement of \(B\) to \(A\). That means we can use a binary adder to perform the binary subtraction.

**4 BIT PARALLEL SUBTRACTOR**

The number to be subtracted \((B)\) is first passed through inverters to obtain its 1’s complement. The 4-bit adder then adds \(A\) and 2’s complement of \(B\) to produce the subtraction. \(S_3 S_2 S_1 S_0\) represent the result of binary subtraction \((A - B)\) and carry output \(C_{out}\) represents the polarity of the result. If \(A > B\) then \(C_{out} = 0\) and the result of binary form \((A - B)\) then \(C_{out} = 1\) and the result is in the 2’s complement form.

**BLOCK DIAGRAM**
Half Subtractors

Half subtractor is a combination circuit with two inputs and two outputs (difference and borrow). It produces the difference between the two binary bits at the input and also produces a output (Borrow) to indicate if a 1 has been borrowed. In the subtraction (A - B), A is called as Minuend bit and B is called as Subtrahend bit.

TRUTH TABLE

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

CIRCUIT DIAGRAM
Full Subtractors

The disadvantage of a half subtractor is overcome by full subtractor. The full subtractor is a combinational circuit with three inputs A, B, C and two output D and C’. A is the minuend, B is subtrahend, C is the borrow produced by the previous stage, D is the difference output and C’ is the borrow output.

TRUTH TABLE

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

CIRCUIT DIAGRAM
Multiplexers

Multiplexer is a special type of combinational circuit. There are n-data inputs, one output and m select inputs with $2m = n$. It is a digital circuit which selects one of the n data inputs and routes it to the output. The selection of one of the n inputs is done by the selected inputs. Depending on the digital code applied at the selected inputs, one out of n data sources is selected and transmitted to the single output Y. E is called the strobe or enable input which is useful for the cascading. It is generally an active low terminal that means it will perform the required operation when it is low.

**BLOCK DIAGRAM**
Multiplexers come in multiple variations

- 2 : 1 multiplexer
- 4 : 1 multiplexer
- 16 : 1 multiplexer
- 32 : 1 multiplexer

**BLOCK DIAGRAM**
TRUTH TABLE

<table>
<thead>
<tr>
<th>Enable</th>
<th>Select</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>S</td>
<td>Y</td>
</tr>
<tr>
<td>0</td>
<td>x</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>D₀</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>D₁</td>
</tr>
</tbody>
</table>

x = Don’t care

Demultiplexers

A demultiplexer performs the reverse operation of a multiplexer i.e. it receives one input and distributes it over several outputs. It has only one input, n outputs, m select input. At a time only one output line is selected by the select lines and the input is transmitted to the selected output line. A de-multiplexer is equivalent to a single pole multiple way switch as shown in fig.

Demultiplexers come in multiple variations

- 1 : 2 demultiplexer
- 1 : 4 demultiplexer
- 1 : 16 demultiplexer
- 1 : 32 demultiplexer

BLOCK DIAGRAM

TRUTH TABLE
Decoder

A decoder is a combinational circuit. It has n input and to a maximum m = 2^n outputs. Decoder is identical to a demultiplexer without any data input. It performs operations which are exactly opposite to those of an encoder.

BLOCK DIAGRAM

Examples of Decoders are following.

- Code converters
- BCD to seven segment decoders
- Nixie tube decoders
- Relay actuator

2 to 4 Line Decoder

The block diagram of 2 to 4 line decoder is shown in the fig. A and B are the two inputs where D through D are the four outputs. Truth table explains the operations of a decoder. It shows that each output is 1 for only a specific combination of inputs.
**BLOCK DIAGRAM**

![Block Diagram of a 2 to 4 line decoder](image)

**TRUTH TABLE**

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**LOGIC CIRCUIT**

![Logic Circuit](image)
Encoder

Encoder is a combinational circuit which is designed to perform the inverse operation of the decoder. An encoder has $n$ number of input lines and $m$ number of output lines. An encoder produces an $m$ bit binary code corresponding to the digital input number. The encoder accepts an $n$ input digital word and converts it into an $m$ bit another digital word.

BLOCK DIAGRAM

Examples of Encoders are following.

- Priority encoders
- Decimal to BCD encoder
- Octal to binary encoder
- Hexadecimal to binary encoder

Priority Encoder

This is a special type of encoder. Priority is given to the input lines. If two or more input line are 1 at the same time, then the input line with highest priority will be considered. There are four input $D_0$, $D_1$, $D_2$, $D_3$ and two output $Y_0$, $Y_1$. Out of the four input $D_3$ has the highest priority and $D_0$ has the lowest priority. That means if $D_3 = 1$ then $Y_1$, $Y_1 = 11$ irrespective of the other inputs. Similarly if $D_3 = 0$ and $D_2 = 1$ then $Y_1$, $Y_0 = 10$ irrespective of the other inputs.

BLOCK DIAGRAM
Highest priority input

\[ D_3 \quad D_2 \quad D_1 \quad D_0 \longrightarrow Y_1 \]

Priority Encoder

Lowest priority input

\[ D_3 \quad D_2 \quad D_1 \quad D_0 \longrightarrow Y_0 \]

TRUTH TABLE

<table>
<thead>
<tr>
<th>Highest</th>
<th>Inputs</th>
<th>Lowest</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( D_3 )( D_2 ) ( D_1 )</td>
<td>( D_0 )</td>
<td>( Y_1 ) ( Y_0 )</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>x</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>x</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>1</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

LOGIC CIRCUIT

\[ Y_1 = D_3 + D_2 \]

\[ Y_0 = D_2 \overline{D_3}D_1 \]
The script is written using standard features of the scripting language.

Assessment criteria

4.3

The combinational circuit does not use any memory. Hence the previous state of input does not have any effect on the present state of the circuit. But sequential circuit has memory so output can vary based on input. This type of circuits uses previous input, output, clock and a memory element.

BLOCK DIAGRAM

Flip Flop

Flip flop is a sequential circuit which generally samples its inputs and changes its outputs only at particular instants of time and not continuously. Flip flop is said to be edge sensitive or edge triggered rather than being level triggered like latches.

S-R Flip Flop
It is basically S-R latch using NAND gates with an additional **enable** input. It is also called as level triggered SR-FF. For this circuit in output will take place if and only if the enable input (E) is made active. In short this circuit will operate as an S-R latch if E= 1 but there is no change in the output if E = 0.

**BLOCK DIAGRAM**

![Block Diagram]

**CIRCUIT DIAGRAM**

![Circuit Diagram]

**TRUTH TABLE**

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Outputs</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>E  S  R</td>
<td>Q₋  Q₋₋</td>
<td></td>
</tr>
<tr>
<td>1  0  0</td>
<td>Q₋  Q₋₋</td>
<td>No change</td>
</tr>
<tr>
<td>1  0  1</td>
<td>0  1</td>
<td>Rset</td>
</tr>
<tr>
<td>1  1  0</td>
<td>1  0</td>
<td>Set</td>
</tr>
<tr>
<td>1  1  1</td>
<td>x  x</td>
<td>Indeterminate</td>
</tr>
</tbody>
</table>
OPERATION

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Condition</th>
<th>Operation</th>
</tr>
</thead>
</table>
| 1    | S = R = 0 : No change | If S = R = 0 then output of NAND gates 3 and 4 are forced to become 1.  
Hence R' and S' both will be equal to 1. Since S' and R' are the input of the basic S-R latch using NAND gates, there will be no change in the state of outputs. |
| 2    | S = 0, R = 1, E = 1 | Since S = 0, output of NAND-3 i.e. R' = 1 and E = 1 the output of NAND-4 i.e. S' = 0.  
Hence Q_{n+1} = 0 and Q_{n+1}' = 1. This is reset condition. |
| 3    | S = 1, R = 0, E = 1 | Output of NAND-3 i.e. R' = 0 and output of NAND-4 i.e. S' = 1.  
Hence output of S-R NAND latch is Q_{n+1} = 1 and Q_{n+1}' = 0. This is the reset condition. |
| 4    | S = 1, R = 1, E = 1 | As S = 1, R = 1 and E = 1, the output of NAND gates 3 and 4 both are 0 i.e. S' = R' = 0.  
Hence the Race condition will occur in the basic NAND latch. |

Master Slave JK Flip Flop

Master slave JK FF is a cascade of two S-R FF with feedback from the output of second to input of first. Master is a positive level triggered. But due to the presence of the inverter in the clock line, the slave will respond to the negative level. Hence when the clock = 1
(positive level) the master is active and the slave is inactive. Whereas when clock = 0 (low level) the slave is active and master is inactive.

CIRCUIT DIAGRAM

![Circuit Diagram]

TRUTH TABLE

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Outputs</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>J</td>
<td>K</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

OPERATION

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Condition</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>J = K = 0 (No change)</td>
<td>- When clock = 0, the slave becomes active and master is inactive. But since the S and R inputs have not changed, the slave outputs will also remain unchanged. Therefore outputs will not change if J = K =0.</td>
</tr>
<tr>
<td>2</td>
<td>J = 0 and K = 1 (Reset)</td>
<td>- Clock = 1: Master active, slave inactive. Therefore outputs of the master become Q&lt;sub&gt;1&lt;/sub&gt; = 0 and Q&lt;sub&gt;1&lt;/sub&gt; bar = 1. That means S = 0 and R =1.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Clock = 0: Slave active, master inactive Therefore outputs of</td>
</tr>
</tbody>
</table>
| J = 1 and K = 0 (Set) | the slave become \( Q = 0 \) and \( Q^\text{bar} = 1 \).
- Again clock = 1: Master active, slave inactive. Therefore even with the changed outputs \( Q = 0 \) and \( Q^\text{bar} = 1 \) fed back to master, its outputs will \( Q^1 = 0 \) and \( Q^1^\text{bar} = 1 \). That means \( S = 0 \) and \( R = 1 \).
- Hence with clock = 0 and slave becoming active the outputs of slave will remain \( Q = 0 \) and \( Q^\text{bar} = 1 \). Thus we get a stable output from the Master slave. |
| J = K = 1 (Toggle) | \( J = K = 1 \) \( \text{(Toggle)} \)
- Clock = 1: Master active, slave inactive. Therefore outputs of the master become \( Q^1 = 1 \) and \( Q^1^\text{bar} = 0 \). That means \( S = 1 \) and \( R = 0 \).
- Clock = 0: Slave active, master inactive Therefore outputs of the slave become \( Q = 1 \) and \( Q^\text{bar} = 0 \).
- Again clock = 1: then it can be shown that the outputs of the slave are stabilized to \( Q = 1 \) and \( Q^\text{bar} = 0 \). |
- Clock = 1: Master active, slave inactive. Outputs of master will toggle. So \( S \) and \( R \) also will be inverted.
- Clock = 0: Slave active, master inactive. Outputs of slave will toggle.
- These changed output are returned back to the master inputs. But since clock = 0, the master is still inactive. So it does not respond to these changed outputs. This avoids the multiple toggling which leads to the race around condition. The master slave flip flop will avoid the race around condition.
Delay Flip Flop / D Flip Flop

Delay Flip Flop or D Flip Flop is the simple gated S-R latch with a NAND inverter connected between S and R inputs. It has only one input. The input data is appearing at the output after some time. Due to this data delay between i/p and o/p, it is called delay flip flop. S and R will be the complements of each other due to NAND inverter. Hence $S = R = 0$ or $S = R = 1$, these input condition will never appear. This problem is avoid by SR = 00 and SR = 1 conditions.

**BLOCK DIAGRAM**

**CIRCUIT DIAGRAM**
TRUTH TABLE

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Outputs</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>D</td>
<td>$Q_{n+1}$</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

OPERATION

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Condition</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$E = 0$</td>
<td>$\bullet$ Latch is disabled. Hence is no change in output.</td>
</tr>
<tr>
<td>2</td>
<td>$E = 1$ and $D = 0$</td>
<td>$\bullet$ If $E = 1$ and $D = 0$ then $S = 0$ and $R = 1$. Hence irrespective of the present state, the next state is $Q_{n+1} = 0$ and $Q_{n+1}^{\text{bar}} = 1$. This is the reset condition.</td>
</tr>
<tr>
<td>3</td>
<td>$E = 1$ and $D = 1$</td>
<td>$\bullet$ If $E = 1$ and $D = 1$, then $S = 1$ and $R = 0$. This will set the latch and $Q_{n+1} = 1$ and $Q_{n+1}^{\text{bar}} = 0$ irrespective of the present state.</td>
</tr>
</tbody>
</table>

**Toggle Flip Flop / T Flip Flop**

Toggle flip flop is basically a JK flip flop with J and K terminals permanently connected together. It has only input denoted by $T$ is shown in the Symbol Diagram. The symbol for positive edge triggered T flip flop is shown in the Block Diagram.

**SYMBOL DIAGRAM**
Demonstrate an understanding of creating multimedia/web-based computer applications with scripting.

**Block Diagram**

![Block Diagram](image)

**Truth Table**

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Outputs</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>T</td>
<td>Q&lt;sub&gt;out&lt;/sub&gt;</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>Q&lt;sub&gt;out&lt;/sub&gt;</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>Q&lt;sub&gt;out&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

**Operation**

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Condition</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T = 0, J = K = 0</td>
<td>The output Q and Q bar won't change</td>
</tr>
<tr>
<td>2</td>
<td>T = 1, J = K = 1</td>
<td>Output will toggle corresponding to every leading edge of clock signal.</td>
</tr>
<tr>
<td>Role play</td>
<td><img src="image.png" alt="Image" /></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------</td>
<td></td>
</tr>
<tr>
<td>Activity: 1.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Instructions</strong></td>
<td>which logic diagram of the scripts is demonstrated in the specified outcome</td>
<td></td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>Individual Activity</td>
<td></td>
</tr>
<tr>
<td><strong>Media Method</strong></td>
<td>Flipchart</td>
<td></td>
</tr>
<tr>
<td><strong>Answers:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CCFO</strong></td>
<td>DEMONSTRATING</td>
<td></td>
</tr>
<tr>
<td><strong>Marks</strong></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Project</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------------------</td>
<td></td>
</tr>
<tr>
<td>Group Activity: 1.11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Instructions</th>
<th>Which operating environment of the computer and associated applications and software are configured so that it may be used as outlined in the plan.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCFO</td>
<td>COMMUNICATING</td>
</tr>
<tr>
<td>Method</td>
<td>Group Activity</td>
</tr>
<tr>
<td>Answers:</td>
<td></td>
</tr>
<tr>
<td>Media Method</td>
<td>Flipchart</td>
</tr>
</tbody>
</table>

Learner guide
Date of review: June 2015
<table>
<thead>
<tr>
<th>Research PROJECT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity: 1.12</td>
<td></td>
</tr>
</tbody>
</table>

**Instructions**

Which script is written using standard features of the scripting language?

<table>
<thead>
<tr>
<th>CCFO</th>
<th>Collecting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Method</strong></td>
<td><strong>Group Activity</strong></td>
</tr>
<tr>
<td><strong>Media Method</strong></td>
<td><strong>Flipchart</strong></td>
</tr>
<tr>
<td><strong>Answers</strong></td>
<td></td>
</tr>
</tbody>
</table>
### Simulation

#### ACTIVITY 1.2

<table>
<thead>
<tr>
<th>Instructions</th>
<th>identify script tested, errors and corrected through most likely conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCF0</td>
<td>ORGANISING</td>
</tr>
<tr>
<td>Method</td>
<td>Group Activity</td>
</tr>
<tr>
<td>Media Method</td>
<td>Flipchart</td>
</tr>
<tr>
<td>Mark</td>
<td>10</td>
</tr>
<tr>
<td>Answer:</td>
<td></td>
</tr>
</tbody>
</table>
Take some time to reflect on what you have learnt in this module and assess your knowledge against the following pointers. Write down your answers. Should you not be able to complete each of these statements, go back to your notes and check on your understanding? You can also discuss the answers with a colleague.

How do you create multimedia/web-based computer application scripts?
Unit 5

Assemble a multimedia/web-based application including scripts.

Unit Outcomes

At the end of this unit you should be able to:

Exit Learning Outcomes:

1. **Introduction** The multimedia/web-based application is assembled using the saved text, graphics and animation, written application scripts and planned specification and user requirement.

2. The function and content of the application are consistent with the design specification and specified computer system environment.

Conclusion
The multimedia/web-based application is assembled using the saved text, graphics and animation, written application scripts and planned specification and user requirement.

Web server is a computer where the web content is stored. Basically web server is used to host the web sites but there exists other web servers also such as gaming, storage, FTP, email etc.

Web site is collection of web pages while web server is a software that respond to the request for web resources.

Web Server Working

Web server respond to the client request in either of the following two ways:

- Sending the file to the client associated with the requested URL.
- Generating response by invoking a script and communicating with database
Key Points

- When client sends request for a web page, the web server search for the requested page if requested page is found then it will send it to client with an HTTP response.

- If the requested web page is not found, web server will send an **HTTP response: Error 404 Not found.**

- If client has requested for some other resources then the web server will contact to the application server and data store to construct the HTTP response.

Architecture

Web Server Architecture follows the following two approaches:

1. Concurrent Approach


**Concurrent Approach**

Concurrent approach allows the web server to handle multiple client requests at the same time. It can be achieved by following methods:

- Multi-process
- Multi-threaded
- Hybrid method.

**Multi-processing**

In this a single process (parent process) initiates several single-threaded child processes and distribute incoming requests to these child processes. Each of the child processes are responsible for handling single request.

It is the responsibility of parent process to monitor the load and decide if processes should be killed or forked.

- Multi-threaded
  - Unlike Multi-process, it creates multiple single-threaded process.

- Hybrid
  - It is combination of above two approaches. In this approach multiple process are created and each process initiates multiple threads. Each of the threads handles one connection. Using multiple threads in single process results in less load on system resources.

**Examples**

Following table describes the most leading web servers available today:

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Web Server Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Apache HTTP Server</strong></td>
</tr>
<tr>
<td></td>
<td>This is the most popular web server in the world developed by the Apache Software Foundation. Apache web server is an open source software and can be installed on almost all operating systems including Linux, UNIX, Windows, FreeBSD, Mac OS X and more. About 60% of the web server machines run the Apache Web Server.</td>
</tr>
<tr>
<td>2</td>
<td><strong>Internet Information Services (IIS)</strong></td>
</tr>
<tr>
<td></td>
<td>The Internet Information Server (IIS) is a high performance Web Server from Microsoft. This web server runs on Windows NT/2000 and 2003 platforms (and may be on upcoming new Windows version also). IIS comes bundled with Windows NT/2000 and 2003; Because IIS is tightly integrated with the operating system so it is...</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>relatively easy to administer it.</td>
</tr>
</tbody>
</table>
| 3. | **Lighttpd**  
The lighttpd, pronounced lighty is also a free web server that is distributed with the FreeBSD operating system. This open source web server is fast, secure and consumes much less CPU power. Lighttpd can also run on Windows, Mac OS X, Linux and Solaris operating systems. |
| 4. | **Sun Java System Web Server**  
This web server from Sun Microsystems is suited for medium and large web sites. Though the server is free it is not open source. It however, runs on Windows, Linux and UNIX platforms. The Sun Java System web server supports various languages, scripts and technologies required for Web 2.0 such as JSP, Java Servlets, PHP, Perl, Python, and Ruby on Rails, ASP and Coldfusion etc. |
| 5. | **Jigsaw Server**  
Jigsaw (W3C's Server) comes from the World Wide Web Consortium. It is open source and free and can run on various platforms like Linux, UNIX, Windows, and Mac OS X Free BSD etc. Jigsaw has been written in Java and can run CGI scripts and PHP programs. |
<table>
<thead>
<tr>
<th>Assessment criteria</th>
<th>The function and content of the application are consistent with the design specification and specified computer system environment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2</td>
<td></td>
</tr>
</tbody>
</table>

Proxy server is an intermediary server between client and the internet. Proxy servers offers the following basic functionalities:

- Firewall and network data filtering.
- Network connection sharing
- Data caching

Proxy servers allow to hide, conceal and make your network id anonymous by hiding your IP address.

Purpose of Proxy Servers

Following are the reasons to use proxy servers:

- Monitoring and Filtering
- Improving performance
- Translation
- Accessing services anonymously
- Security

Monitoring and Filtering

Proxy servers allow us to do several kind of filtering such as:

- Content Filtering
• Filtering encrypted data
• Bypass filters
• Logging and eavesdropping

Improving performance
It fasten the service by process of retrieving content from the cache which was saved when previous request was made by the client.

**Translation**
It helps to customize the source site for local users by excluding source content or substituting source content with original local content. In this the traffic from the global users is routed to the source website through Translation proxy.

**Accessing services anonymously**
In this the destination server receives the request from the anonymizing proxy server and thus does not receive information about the end user.

**Security**
Since the proxy server hides the identity of the user hence it protects from spam and the hacker attacks.

**Type of Proxies**
Following table briefly describes the type of proxies:

**Forward Proxies**
In this the client requests its internal network server to forward to the internet.
Open Proxies

Open Proxies helps the clients to conceal their IP address while browsing the web.

Reverse Proxies

In this the requests are forwarded to one or more proxy servers and the response from the proxy server is retrieved as if it came directly from the original Server.

Architecture

The proxy server architecture is divided into several modules as shown in the following diagram:
Proxy user interface

This module controls and manages the user interface and provides an easy to use graphical interface, window and a menu to the end user. This menu offers the following functionalities:

- Start proxy
- Stop proxy
- Exit
- Blocking URL
- Blocking client
- Manage log
- Manage cache
- Modify configuration

## Formative assessment

<table>
<thead>
<tr>
<th>Role play</th>
<th>Activity: 1.13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructions</td>
<td>which multimedia/web-based application is assembled using the saved text, graphics and animation, written application scripts and planned specification and user requirement</td>
</tr>
<tr>
<td>Method</td>
<td>Individual Activity</td>
</tr>
<tr>
<td>Media Method</td>
<td>Flipchart</td>
</tr>
</tbody>
</table>

### Answers:

| CCFO | DEMONSTRATING |
| Marks | 10 |
### Project

**Group Activity: 1.14**

<table>
<thead>
<tr>
<th>Instructions</th>
<th>Which function and content of the application are consistent with the design specification and specified computer system environment?</th>
</tr>
</thead>
</table>

**CCFO**

**Communicating**

**Method**

Group Activity

**Answers:**

**Media Method**

Flipchart
Essay

Take some time to reflect on what you have learnt in this module and assess your knowledge against the following pointers. Write down your answers. Should you not be able to complete each of these statements, go back to your notes and check on your understanding? You can also discuss the answers with a colleague.

How do you Assemble a multimedia/web-based application including scripts?

________________________________________________________________________________

________________________________________________________________________________

________________________________________________________________________________

________________________________________________________________________________

________________________________________________________________________________
### References

**Prescribed Booklist**

<table>
<thead>
<tr>
<th>Learning unit</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>14933 Demonstrate an understanding of creating multimedia/web-based computer applications with scripting</td>
<td>Yellow Media Publishers</td>
</tr>
<tr>
<td></td>
<td>Senior learning material Developer:</td>
</tr>
<tr>
<td></td>
<td>Ms Duduzile Zwane</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.yellowmedia.co.za">www.yellowmedia.co.za</a></td>
</tr>
<tr>
<td></td>
<td><a href="mailto:dudu@yellowmedia.co.za">dudu@yellowmedia.co.za</a></td>
</tr>
</tbody>
</table>
SECTION C: SELF REFLECTION

I enjoyed/did not enjoy this module because:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
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________________________________________________________________________
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________________________________________________________________________

I enjoyed/did not enjoy this module because:

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________________________________________________________________________

I found group work ___________________________ !!!
The most interesting thing I learnt was:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
I feel I have gained the necessary skills and knowledge to:

----------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------

Please add the following to this module:

----------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------

Some comments from my classmates about my participation in class:

----------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------------------

----------------------------------------------------------------------------------------------------------------------------------
Self-Assessment:

You have come to the end of this module – please take the time to review what you have learnt to date, and conduct a self-assessment against the learning outcomes of this module by following the instructions below:

Rate your understanding of each of the outcomes listed below:

Keys:

- × - no understanding
- ● - Some idea
- ✓ - Completely comfortable

<table>
<thead>
<tr>
<th>NO</th>
<th>OUTCOME</th>
<th>SELF RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plan the use of a multimedia/web-based authoring computer application with scripting.</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>Design a multimedia/web-based computer application.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Identify and save text, graphic elements and animation</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Create multimedia/web-based computer application scripts.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Assemble a multimedia/web-based application including scripts.</td>
<td></td>
</tr>
</tbody>
</table>
Learner Evaluation Form

<table>
<thead>
<tr>
<th>Learning Programme Name</th>
<th>Facilitator Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner name (Optional)</td>
<td>Dates of Facilitation</td>
</tr>
<tr>
<td>Employer / Work site</td>
<td>Date of Evaluation</td>
</tr>
</tbody>
</table>

**Learner Tip:**

Please complete the Evaluation Form as thoroughly as you are able to, in order for us to continuously improve our training quality!

The purpose of the Evaluation Form is to evaluate the following:

- logistics and support
- facilitation
- training material
- assessment

Your honest and detailed input is therefore of great value to us, and we appreciate your assistance in completing this evaluation form!
### A Logistics and Support Evaluation

<table>
<thead>
<tr>
<th>No</th>
<th>Criteria / Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Was communication regarding attendance of the programme efficient and effective?</td>
</tr>
<tr>
<td>2</td>
<td>Was the Programme Coordinator helpful and efficient?</td>
</tr>
<tr>
<td>3</td>
<td>Was the training equipment and material used effective and prepared?</td>
</tr>
<tr>
<td>4</td>
<td>Was the training venue conducive to learning (set-up for convenience of learners, comfortable in terms of temperature, etc.)?</td>
</tr>
</tbody>
</table>

**Additional Comments on Logistics and Support**

<table>
<thead>
<tr>
<th>No</th>
<th>Criteria / Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Facilitator was prepared and knowledgeable on the subject of the programme</td>
</tr>
<tr>
<td>2</td>
<td>The Facilitator encouraged learner participation and input</td>
</tr>
<tr>
<td>3</td>
<td>The Facilitator made use of a variety of methods, exercises, activities and discussions</td>
</tr>
<tr>
<td>4</td>
<td>The Facilitator used the material in a structured and effective manner</td>
</tr>
<tr>
<td>5</td>
<td>The Facilitator was understandable, approachable and respectful of the learners</td>
</tr>
<tr>
<td>6</td>
<td>The Facilitator was punctual and kept to the schedule</td>
</tr>
</tbody>
</table>

**Additional Comments on Facilitation**
### Learning Programme Evaluation

<table>
<thead>
<tr>
<th>No</th>
<th>Criteria / Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The learning outcomes of the programme are relevant and suitable.</td>
</tr>
<tr>
<td>2</td>
<td>The content of the programme was relevant and suitable for the target group.</td>
</tr>
<tr>
<td>3</td>
<td>The length of the facilitation was suitable for the programme.</td>
</tr>
<tr>
<td>4</td>
<td>The learning material assisted in learning new knowledge and skills to apply in a practical manner.</td>
</tr>
<tr>
<td>5</td>
<td>The Learning Material was free from spelling and grammar errors</td>
</tr>
<tr>
<td>6</td>
<td>Handouts and Exercises are clear, concise and relevant to the outcomes and content.</td>
</tr>
<tr>
<td>7</td>
<td>Learning material is generally of a high standard, and user friendly</td>
</tr>
</tbody>
</table>

### Additional Comments on Learning Programme


### Assessment Evaluation

<table>
<thead>
<tr>
<th>No</th>
<th>Criteria / Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A clear overview provided of the assessment requirements of the programme was provided</td>
</tr>
<tr>
<td>2</td>
<td>The assessment process and time lines were clearly explained</td>
</tr>
<tr>
<td>3</td>
<td>All assessment activities and activities were discussed</td>
</tr>
</tbody>
</table>

### Additional Comments on Assessment

