OCR Computer Science AS Level

1.3.3 Web Technologies

Intermediate Notes

Specification

1.3.3 a)

- HTML
- CSS
- JavaScript

1.3.3 b)

- Lossy Compression
- Lossless Compression

Web Development

HTML

HTML is the language/script that web pages are written in. It allows a browser to interpret and render a webpage for the viewer by describing the structure and order of the webpage. The language uses tags written in angle brackets (<tag>, </tag>) and describes web pages in two primary sections:, a body and head. The head contains elements like the title of the webpage and the body contains the content of the webpage.

HTML Tags

- <html> : All code written within these tags is interpreted as HTML
- <body> : Defines the content in the main browser content area
- <link> : Used to link to a CSS stylesheet or other file
- <head> : Defines the browser tab or window heading area
- <title> : Defines the text that appears with the tab or window heading area
- <h1>, <h2>, <h3> : Heading styles in decreasing sizes
- <p> : A paragraph separated with a line space above and below
- <img> : Self closing image tag (no need for `</img>`) with parameters (img src = location, height=x, width = y)
- <a> : Anchor tag defining a hyperlink with location parameters (link text)
- : Defines an ordered list
- : Defines an unordered list
- : Defines an individual list item
- : Creates a division of a page into separate areas each which can be referred to uniquely by name, (`<div id= "page">`)

Classes and Identifiers

Class and identifier selectors are items to which styles can be applied, this means groups of items can be styled, the selectors for HTML are usually the `div` tags.

Identifiers are defined with a hash symbol `#header`. Identifiers must be unique to each webpage. Classes work in a similar way but use a full stop as a prefix to the class name e.g. `.list`. Classes can be used multiple times on a webpage.

CSS

CSS is a script / language like HTML except is used to describe the style of a webpage. CSS can be used to specify the way HTML elements look and can be applied to whole tags such as <h1>, <p> or .

CSS can be used using two different forms, internal (embedded) or external. The internal/embedded CSS is placed inside the style tags and is entered directly within the HTML document. The external CSS is placed inside an external style sheet. A link is created in an external sheet which can be accessed from the HTML.

Whenever you have an external style sheet you add this to the header. Just replace `styles.css` with the name of the stylesheet

```
<link hred= “styles.css” rel= “stylesheet” type= “text/css”>
```

JavaScript

JavaScript is a language which has a similar layout to languages like python. The main function of JavaScript is to add interactivity to websites. JavaScript isn't compiled, instead it is interpreted, this is so it can be interpreted in the browser every time the webpage is displayed, compiled code is dependant on the chips used whereas interpreted code isn't.

Javascript be used to input data on the client's computer, this may change the local page interactively or post data to a server. The advantages:

- The local computer can fix invalid data before sending it off to the servers
- It can ease the traffic off of the busy servers

You can take in inputs from forms on a webpage, you don't need to memorise doing this however, you should understand what to do once you have this input. Below are the examples given by the exam board.

Outputs

Changing the attributes of a html element:

```
chosenElement = document.getElementById(“example”);
chosenElement.innerHTML = “Hello World”;
```

Writing directly to the document:

```
document.write(“Hello World”);
```

You can use an alert box:

```
alert(“Hello World”);
```

Javascript uses a similar layout of programing as you're used to. It relies on a lot of functions, a common mistake made is thinking you have to enter parameters, you don't instead you use the identifiers. Functions are initiated using the following structure:

```
function functionname() {
     // enter the code in here
}
```

Lossy vs Lossless Compression

There are two categories of compression: lossy and lossless. As the name suggests, lossy compression reduces the size of a file while also removing some of its information. This could result in a more pixelated image or less clear audio recording. On the other hand, lossless compression reduces the size of a file without losing any information.

When using lossless compression, the original file can be recovered from the compressed version. Something which is not possible when using lossy compression which reduces the size of the file by completely disregarding some information. For example, audio files can be compressed lossily by removing the very high or very low frequencies which are least noticeable to the ear. There's no way to go from the lossy version of the recording back to the full version as there's no record of what the high and low frequencies were.