

OCR Computer Science A Level

1.3.4 Web Technologies

Concise Notes



Specification

1.3.4 a)

- HTML
- CSS
- JavaScript

1.3.4 b)

- Search engine indexing

1.3.4 c)

- PageRank algorithm

1.3.4 d)

- Server and Client side processing



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>) there are two sections of a webpage, a body and head.

HTML Tags

- **<html>** : all code written within these tags is interpreted as HTML,
- **<body>** : Defines the content in the main browser content area,
- **<link>** : this is used to link to a CSS stylesheet (explained later in the notes)
- **<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
- **** : Self closing image 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
- **<div>** : 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 the names which you style, this means groups of items can be styled, the selectors for HTML are usually the div tags.
- Identifiers are defined with an initial hashtag, and must be unique to each webpage.
- Classes are defined with a full stop as a prefix to the class name, 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, they can be applied to whole tags such as <h1>, <p> or <div>.
- CSS can be used using two different forms, internal/embedded or external CSS the internal CSS is when the style is placed.
- 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 can be paged.

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.
- 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,

Search Engine Indexing

Search Engines

- A search engine is a program that searches through a [database of internet addresses](#) looking for resources based on a criteria set by the client.
- Search engines rely on an [index of web pages](#), web crawlers are used to collect the information it works by traversing the internet web page by webpage looking for linked sites.
- The web crawlers collect keywords and phrases from the web page. Web crawlers also collect the meta data from websites this is the information specified by the website owner.

PageRank Algorithm

- The page rank algorithm ranks each web page, higher ranked pages will show up first on the search engine. There are two factors which determine the page rank of a page:
 - How many [incoming links](#) it has from other web pages,
 - The [page rank](#) of the web pages that [link to it](#)

The data structure used is a [directed graph](#) to show which pages link to what websites, the webpages are nodes and the links between two pages are the arcs between the nodes.

The algorithm of pagerank itself is given by:

$$\text{PageRank}(x) = (1-d) + d[(\text{PageRank}(T1) \div \text{Count}(T1)) + \dots + (\text{PageRank}(Tn) \div \text{Count}(Tn))]$$



11 Server and Client Side Processing

Server side Processing

Server side processing is when a **client sends data to a server** for it to be processed. This means no information is processed on the client computer. The common server side scripting languages are **SQL** or **PHP**. Server side processing is beneficial for a few reasons:

- Doesn't require **plugins** etc
- Can perform **large calculations** much faster than clients,
- Not browser dependent,
- It's more **secure**,

Client side Processing

Client side processing is when a client processes the data on its **local device**. This means all of the information is processed on the client computer. This is also called client side scripting, and uses languages such as **JavaScript**. This is beneficial for a few reasons:

- Webpage can immediately respond to user actions,
- Execute quickly,
- Gives developers more control over the behaviour and look of the website,

