Databases and Cloud Concepts Notes

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An important note, these notes are absolutely ***NOT*** *guaranteed to be correct, representative of the course, or rigorous. Any result of this is not the author's fault.*

Contents

1 The Internet

The internet is a world-wide computer network, connecting computing devices also known as hosts or end systems. These connections can take many forms, such as cables and radio waves. Intermediate switching devices inbetween hosts are known as routers.

1.1 Clients and Servers

A program or machine that responds to requests from others is called a server. A program or machine that sends requests to a server is a client.

1.2 Internet Layers

There are four internet layers:

Layer	Common Protocol	Description
Application	HTTP	Web browsers making requests and parsing responses
Transport	TCP	Breaks requests down into numbered packets and can reassemble messages
Network	IP	Attaches addresses to packets and groups packets based on their incoming addresses
Physical		Sends bits to the local router and assembles bits into packets

1.3 Protocols

Protocols are an agreement on how to communicate.

1.3.1 HTTP - HyperText Transfer Protocol

There are four main operations that can be carried out on HTTP resources:

Operation	Performed by...
Creation	`HTTP POST`
Reading	`HTTP GET`
Updating	`HTTP PUT`
Deletion	`HTTP DELETE`

Requests are formed by an operation as well as a `host` and `content-type` parameter to describe the format of information.

1.3.2 URL - Uniform Resource Locator

Each URL is formed by a scheme (like `http` or `https`), a host (like `www.bristol.ac`), a path (like `.uk/home/maths`). Paths can have queries attached, preceded by `?` as parameters.

2 HTML - HyperText Markup Language

2.1 Tags, Attributes and, Values

Tags form the structure of HTML, with `html`, `head` and, `body` usually forming the top levels:

```
<html>
    <head>
        <title>Title<\title>
    <\head>
    <body>
        <p>Paragraph<\p>
    <\body>
<\html>
```

Attributes form parts of tags and, as expected, assign attributes to tags. This can describe the width of elements (`width`), the hyperlink attached to text (`href`) and, more:

```
<a href="www.bristol.ac.uk">Bristol<\a>
```

2.1.1 Common Tags

Below is a table containing common HTML tags:

Tag	Description
`h1`, ... `h6`	Headings
`p`	Paragraph
`br`	New line
`ul`	Unordered list
`ol`	Ordered list
`li`	List item
`em`	Emphasis
`strong`	Importance
`q`	Quote
`cite`	Citation
`var`	Variable
`code`	Source code

2.2 Block and Inline Elements

Block level elements take up the full width of the container and start on new lines, so stack vertically.
Inline elements don't start on new lines and only take up as much width as is necessary, so stack horizontally.

2.2.1 Block Tags

Below is a table containing some of the block HTML tags:

Tag	Description
`header`	This is the very top of the page
`main`	This fills the space inbetween the header and footer
`section`	This forms subsections of blocks
`div`	No meaning, for layout purposes
`p`	This forms paragraphs of text
`figure`	This forms images
`nav`	This fills the space left of the main block
`aside`	This fills the space right of the main block
`footer`	This is the very bottom of the page

2.3 Common Attributes

Below is a table containing some of the common HTML attributes:

Attribute	Description
`id`	Uniquely identifies the tag with the value
`class`	Marks tags you want to operate as a group

2.4 Forms

The form tag, shown in the example:

```
<form method="post" action="/comment/comment.php">
    <p>
        <label for="name">Name:</label>
        <input type="text" id="name" />
    </p>
    <p>
        <button type="submit">OK</button>
    </p>
</form>
```

The `method` attribute takes two values `GET` and `POST`. The former places the information in the URL parameters and the latter utilises a HTTP request.
The `action` attribute defines an action to be performed when the form is submitted. In this case, it's sent to a PHP script.
The `label for` attribute should link to a `input id`. Additionally, the `input name` attribute is the key which accompanies the input value in the request.
The `button` tag has three types, a `submit` button that makes the request, a `reset` button that resets all fields and, a `button` type that does nothing by default but can be configured using Javascript.

Types can be used to make field use a specific format or be required. Additionally, they can be given placeholder text and autocompletion properties.

3 CSS - Cascading Stylesheets

CSS describes how HTML elements should be drawn to the screen. It can be used:

- Inline with the `style` attribute,
- Internally with the `style` tag in the `head` section,
- Externally via linking to a `.css` file.

3.1 Stylesheet Linking

We can link to external stylesheets as follows:

```
<link rel="stylesheet" href="styles.css">
```

3.2 CSS File Structure

The parts of CSS files are formed as follows:

```
selector {
    key: value;
}
```

3.2.1 Selectors

Selectors can be a:

- tag, written simply as `div`,
- class, written as `.class`,
- id, written as `#id`.