CSCI 3000
Web Programming

1.0 Introduction

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Course Objectives

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- to implement (write, debug and test) client-side web applications.
- to implement (write, debug and test) server-side web applications.

Course Resources

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- **w3schools.com:**

  `https://www.w3schools.com`

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- **learn-php.org:**

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- **codecademy:**

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Web Technologies

- **Internet:** is the largest network of networks. It connects computers and devices that can communicate with each other.
- **Web (World Wide Web):** is the network of computers (Web servers) that share data and information using Internet infrastructure.
  - uses the HTTP protocol (allows applications to communicate).
  - uses browsers to access Web documents called Web pages that are linked to each other via hyperlinks.

Modern Web Technologies (1/3)

- **Mark-up languages:**
  - HyperText Markup Language (HTML, HTML5.1)
  - Extensible Markup Language (XML)
  - Extensible HyperText Markup Language (XHTML)
  - Synchronized Multimedia Integration Language (SMIL)
  - Mathematical Markup Language (MathML)
  - Scalable Vector Graphics (SVG) is an XML - based vector image format

Modern Web Technologies (2/3)

- **Style sheet languages:**
  - Cascading Style Sheets (CSS)
- **Scripting languages:**
  - JavaScript. Runs in the browser and is used to build advanced interactive Web sites and applications.
  - Web Application Programming Interface (API). Building tools for Web content and applications.
  - Web Graphics Library (WebGL). JavaScript API for rendering interactive 3D and 2D graphics.

Modern Web Technologies (3/3)

- **Programming languages:**
  - Perl, PHP, Java, etc.
- **Databases:**
  - MySQL, PostGres (PostGreSQL)
- **Web Server Technologies:**
  - LAMP framework (Linux, Apache, MySQL, and PHP) or XAMP.
  - Apache = Apache is a short name for the Apache HTTP Server Project.

Mobile Computing

- Mobile computing is a type of computing involving mobile technologies.
- Mobile technologies include wireless communication and portable and smart devices.
- Mobile technologies have evolved greatly over the past 8-10 years.
- One major area of mobile computing is mobile application development.

Mobile Technologies (1/3)

Wireless Communication

- Development of wireless networks that span small and large areas.
- Deregulation world wide and electromagnetic spectrum auction/offer.
- Standard communication systems and air link interfaces.
- Wireless technology in terms of speed and coverage.
- Mobility vs Bandwidth.
- GMS base stations in Europe.

Mobile Technologies (2/3)

Portable and Smart Devices

- Include laptops, notebooks, sub-notebooks, hand- held computers, PDAs, tablets and smartphones.
- These mobile devices have various features such as geotracking, sensing and multimedia.
- Wearable devices like Google Glass and smart watches.
- Embedded computing systems such as embedded development boards (Arduino, Raspberry Pi, Intel Galileo), sensor networks, in-vehicle computing, UAVs, and robots.

Mobile Technologies (3/3)

- Use of small size portable computers, hand-helds, and other small wearable devices to run stand- alone applications or access remote applications
  - via wireless networks: IR, BlueTooth, W- LANs, Cellular, W-Packet Data networks, SAT. etc.
  - by nomadic and mobile users (animals, agents, trains, cars, cell phones, etc).

Mobile Web Applications

- Not real applications (they are websites). Look and fell like real applications.
- They are run by a browser.
- Typically written in HTML5 (HTML 5.1).
- “Installation” is by bookmarking it.
- Distinction between web apps and regular web pages has become blurry.
- HTML5: GPS, tap-to-call, camera API. Still limited.

Mobile Hybrid Applications (1/2)

- Hybrid apps, like native apps, run on the device itself (in a native container and not in a browser).
- Are written with web technologies (HTML5 , CSS3 and JavaScript).
- Hybrid apps leverage the device's browser engine.
- A web-to-native abstraction layer enables access to device capabilities (accelerometer, camera, and local storage).
- Hybrid apps live in an app store.

Mobile Hybrid Applications (2/2)

- Wrappers for web sites create hybrid apps in an cost effective way and allows app store presence.
- Hybrid apps allow cross-platform development. Same HTML code components can be reused for different mobile operating systems.
- **Frameworks** like Ionic, Sencha Touch, Appcelerator Titanium, PhoneGap(now Apache Cordova),etc allow us to design and develop across platforms using web technologies.

Native Applications

- Live on the device and are accessed through icons.
- Are installed through an application store (such as Google Play or Apple's App Store).
- They are developed specifically for one platform, and can take full advantage of all the device features (camera, GPS, the accelerometer, the compass, the list of contacts, etc.)
- Incorporate gestures (OS provided or developed) Can use device's notification system and can work offline.

Full Stack Development

https://rubygarage.org