MODULE I

Smart Device

A **smart device** is an electronic device, generally connected to other devices or networks via different wireless protocols such as Bluetooth, Zigbee, NFC, Wi-Fi, LiFi, 5G, etc., that can operate to some extent interactively and autonomously.

Several notable types of ***smart devices are smartphones, smart vehicles , smart thermostats, smart doorbells, smart locks, smart refrigerators, phablets and tablets, smartwatches, smart bands, smart key chains***, and others.

The term can also refer to a device that exhibits some properties of ubiquitous computing, including—although not necessarily—artificial intelligence.

Programming

programming is the process of designing and building an executable computer program to accomplish a specific computing result or to perform a specific task.

Programming involves tasks such as: analysis, generating algorithms, profiling algorithms' accuracy and resource consumption, and the implementation of algorithms in a chosen programming language (commonly referred to as ***coding***)

VARIOUS MOBILE TECHNOLOGIES

- MOBILE TECHNOLOGIES
  - Technology used for cellular communication.

Major mobile technologies are

- CDMA
- GSM(2G,3G,4G,5G,etc
- GPRS
- EDGE
- UMTS
- LTS etc

GSM(Global System for Mobile Communication

- Most popular technology
- Developed by European Telecommunications Standards Institute
- Works under 2G mobile network connectivity
- Mainly depends on 900 MHz and 1900 MHz network bands

Some of the features are

- Voice calls
- Call forwarding
- Call Barring
- Call Waiting
- SMS – Short Message Service
- Voice Conference

1G

- First generation of GSM
- Analog technology
- Designed exclusively for voice communication
- Introduced in US in early 1980s
- Speed up to 2.4kbps
- Mobile phones with limited battery life
- No data security

2G

- 2G Stands for “second generation”
- Digital (rather than analog)
- Introduced in Finland in 1991
- Introduced encryption
- Two versions- GSM and CDMA(Code Division Multiple Access)
- Speed upto 64kbps
- Text and Multimedia messaging possible
- 2G with GPRS is 2.5G

3G

- Speed upto 200kbps
- High speed browsing
- Supports video conferencing, multimedia emails etc.
- Fast and easy audio, video transfer
- 3D gaming

HSPA

- **HSDPA-High Speed Downlink Packet Access** is an advanced technology to 3G
- ie 3.5G
- Supports 7.2 Mbps but actual speed is 3 Mbps only
- Supports to loab Larger files like Mobile TV Streaming and Road maps etc
- **HSUPA-High Speed Uplink Packet Access** is another technology besides of HSDPA
- Created by Nokia and supports 5.76Mbps

HSDPA and HSUPA together called HSPA

UMTS

- Universal Mobile Telecommunications System
- A 3G Technology
- Also called WCDMA (Wideband CDMA)
- Provides faster data transfer rates at 42Mbps

EV-DO(Evolution Data-Only)

- Mainly runs on CDMA Networks for 3G
- Supports 2.4 Mbps Actual speed is 450Kbps

4G

- Major advance is mobile broadband internet services provided to external systems, such as laptops, wireless modems etc.
- Introduced in 2011
- Speed 100Mbps to 1Gbps
- HD moble TV
- Cloud computing
- IP Telephony

LTE (Long Term Evolution)

- A 4G Technology developed for GSM Network
- Is the first 4G technology used in mobile phones across world
- Proposed by NTT DoCoMo
- High speed data transfer for mobile phones with 299.6 Mbps Download speed and 75.4 Mbps Upload speed

CDMA (Code Division Multiple Access)

- A 3G wireless technology
- Competes with GSM network
- Features
  - Good Signal Quality
  - Voice Clarity
  - Minimizes signal break up
  - More reliable network

Various Mobile Operating Systems

- A mobile OS is an OS that is specifically designed to run on mobile devices such as mobile phones, smartphones, PDAs, tablet computers and other handheld devices

Types of Mobile OSs

- Android (Google Inc.)
- Bada (Samsung Electronics)
- Black Berry OS (Research in Motion)
- iPhone OS/iOS (Apple)
- Symbian (Nokia)
- Windows Mobile (Windows Phone)

- **Android OS -** Google's free and open software stack that includes an operating system
- **Bada** – Proprietary Samsung mobile OS that was launched in 2010.
- **BlackBerry OS** – Proprietary mobile OS developed by Research In Motion for use on the companies popular Blackberry handheld devices
- **iPhoe OS** – Originally developed for use on its iPhone devices, Now the mobile os is reffered to as iOS and is supported on a number of Apple devices including the iPhone,iPad,iPad2 and iPod Touch.
- **Symbian** – Mobile OS targeted at mobile phones that offer a high level of integration with communication and personal information management functionality.
- **Windows Mobile** – Microsofts operating system used in smartphones and mobile devices with or without touch screens.

Vendor	Programming Language	Operating System	Application Store
Symbian Foundation	C++	Symbian OS	Nokia Ovi Store
Open Handset Alliance	Java	Android OS	Android Market
Apple	Objective -C	iPhone OS (iOS)	iPhone App Store
RIM	Java	BlackBerry OS	Blackberry App World
Microsoft	Visual C#/C++	Windows Phone	Windows mobile market Place

Fig: Features of some mobile platforms