Unit – 01 : Introduction to Mobile

- A brief history of Mobile,
- Types of mobile phone generations.
- The Mobile Ecosystem,
- Types of Mobile.
- Mobile Information Architecture,
- Android Versions, Features of Android, Android Architecture.
- Installing Android SDK Tools, Configuring Android in Eclipse IDE.
- "Android Development Tools (ADT), Creating Android Virtual Devices (AVD)".

Questions to be discussed :

1. Define mobile computing? Explain the application of mobile computing.
2. Discuss about Mobile. Write its advantage and disadvantage.
3. Explain in details generation of mobile phone.
4. What is android? Explain the features of android phone.
5. Write short notes on :
   a. SDK Tools
   b. Android Virtual Devices (AVD)

Mobile : The device which can able to move or be moved easily

Computing : It is the process of using computer technology to complete a given task.

What is Mobile Computing?

- Mobile computing is a technology.
- It provides an environment where users can transmit data from one device to another without any physical link.
- In other words, you can say that mobile computing allows transmission of data, voice and video via a computer or any other wireless device without being connected to a fixed physical link.
- In this technology, data transmission is done wirelessly with the help of wireless devices such as mobiles, laptops.
- This is only because of Mobile Computing technology that you can access and transmit data from any remote locations without being present there physically.
- The concept of Mobile Computing can be divided into three parts:
  1. Mobile Communication
  2. Mobile Hardware
  3. Mobile Software

Mobile Communication :

- Mobile Communication specifies a framework that is responsible for the working of mobile computing technology.
- This framework ensures the consistency and reliability of communication between wireless devices.
- The mobile communication framework consists of communication devices such as protocols, services, bandwidth, and portals.
- These devices are responsible for delivering a smooth communication process.

Mobile Hardware:

- It consists of mobile devices or device components that can be used to receive or access the service of mobility.
- Examples of mobile hardware can be smartphones, laptops, portable PCs, tablet, Personal Digital Assistants, etc.
- These devices are inbuilt with a receptor medium that can send and receive signals.
- These devices are capable of operating in full-duplex.

Mobile Software:

- Mobile software is a program that runs on mobile hardware.
- This is the operating system for the appliance of mobile devices.
- In other words, you can say it the heart of the mobile systems.
- This is an essential component that operates the mobile device.

Applications of Mobile Computing :

Following is a list of some significant fields in which mobile computing is generally applied:

- Sending and receiving information while on move
- Internet access.
- Global Position System (GPS).
- Emergency services.
- Transmission of news.
- Entertainment services.
- Educational services.

What is Mobile Phone?

- A mobile phone is a wireless handheld device that allows users to make and receive calls.
- A mobile phone is an electronic device which has made our life easier.
- It is also known as cell phone or cellular phone.
- We can call, send text message, watch video & play games etc. on mobile phone.
- It keeps us updated with the news of the world.
- It is also useful in personal as well as office work.
- Nowadays a mobile phone has become an important part of our life.
- It is a great source of entertainment.
- Excess use of mobile phone is very harmful for our health.

Advantage of Mobile Phone :

- Call anytime, any bady
- Easily data transfer
- Take photo and record video anytime
- Help in emergency
- Receive information very easily & quickly
- Show your talent

Disadvantage of Mobile Phone :

- More expenditure of internet & call
- Not good for future
- Release harmful radiation
- Less communication at home
- Accidents

Types of Mobile Phones :

There are three types of phone :

1. Cell Phone
2. Features Phone and
3. Smart Phone

Cell Phone :

- A cellphone is any portable telephone that uses cellular network technology to make and receive calls.
- This type of phone is used to call, send message and do calculation etc.
- It is a normal phone which is widely used before 10 years.
- It is used in efficient manner and carry anywhere easily.

Features Phone :

- A mobile phone that incorporates features such as the ability to access the internet and store and play music but lacks the advanced functionality of a smartphone.
- In this phone user can use camera, Bluethooth, Music player & Surfing internet also.

Smart Phones

- Smart phones are high specification phones that operate like miniature computers.
- They can usually do tasks like connect to the internet and receive emails.
- Recent examples of smart phones are the Apple iPhone, Blackberrys and Google Android phones.

History of Mobile Phone :

- The first cell phone was invented in 1973 by Motorola.
- Motorola engineer Martin Cooper made the first cell phone On April 3, 1973.
- The name of first mobile phone was Motorola DynaTAC 8000X.
- This device offered a talk time of just 30 minutes and required 10 hours to charging.

Cell phones became popular during the cellular revolution that started in the 90s.

1985, The first Siemens phone

- The first Siemens mobile phone was Siemens Mobiltelefon C1, which came in the form of a suitcase.

1992, The first GSM (2G) phone

- As we moved into the 90s, phone bodies became smaller and the antennas thinner.
- In 1992, the next big innovation came in the form of the Nokia 1011, which was the first mass-produced GSM (2G) phone.

The first text message ever sent to a cellphone

- That same year, the first-ever text message was also sent.
- It was sent by a developer to the company director at Vodafone's office Christmas party.
- The text message simply said: "Merry Christmas!"

1994, First smartphone (and touchscreen phone)

- The first smartphone was released in 1994.
- IBM's Simon was the first device to feature apps and a touchscreen, thus it is considered the world's first smartphone.

1997, First phone with no external antenna

- The first phone to appear without a visible external antenna was the Hagenuk Global Handy.

2001, Launch of the 3G network

- The first commercial 3G networks were introduced in 2001.
- It's worth mentioning that custom ringtones were also released that same year, thus becoming the first downloadable content available for cell phones.

2008, First Android phone

- The first Android phone, the HTC Dream, was also launched in 2008.
- The introduction of the Android operating system was criticized due to its lack of functionality and third-party software, but, it was considered innovative due to its notifications system and integration with Google's services.

2009, Launch of the 4G network

- The first release of the Long Term Evolution (LTE) standard was commercially deployed in Norway and Sweden in 2009 and has since become common throughout most parts of the world.

2019, Launch of the 5G network

- In 2019, the fifth-generation network was launched, and so were the first 5G phones.
- The next-generation network came with some bizarre controversies, which we covered here on our blog.

Note :

- 2020 has also been marked by improvements in battery life and charging speeds.
- More and more phones now feature fast charging, which is sure to further improve in the upcoming years.

Mobile Phone Generation :

- The cellular communications networks are known by their numeric generation: 1G, 2G, 3G, 4G and 5G.
- We are currently fully deployed in 4G with 5G gaining ground.

1G (1st Generation):

- First-time calling was introduced in mobile systems.
- It used analog signals.
- Communication was possible through voice only.
- Speed:- 2.4 kbps.

2G (2nd Generation) :

- Shifted from analog to digital.
- It supported voice and SMS both.
- 2G WLAN provided a high data rate & large area coverage.
- Speed:- 64 kbps.

3G (3rd Generation) :

- The Internet system was improved.
- Offers high-speed wireless internet.
- The connection used was UMTS and WCMA.
- Speed:- 2mbps.

4G (4th Generation) :

- LTE (Long term evaluation) was mainly for the internet.
- Vo-LTE (Voice over LTE) is for both voice and the internet.
- HD Quality Streaming.
- Speed:-100mbps.

5G (5th Generation):

- It is yet to come in many countries but here are some notable points about 5G.
- Higher data rates.
- It is 30 times faster than 4G.

What is Android?

- Android is an open source and Linux-based Operating System.
- It is useful for mobile devices such as smartphones and tablet computers.
- Android was developed by the Open Handset Alliance, led by Google, and other companies.
- The first beta version of the Android Software Development Kit (SDK) was released by Google in 2007 where as the first commercial version, Android 1.0, was released in September 2008.
- On June 27, 2012, Google announced the next Android version, 4.1 Jelly Bean.
- Jelly Bean is an incremental update, with the primary aim of improving the user interface, both in terms of functionality and performance.

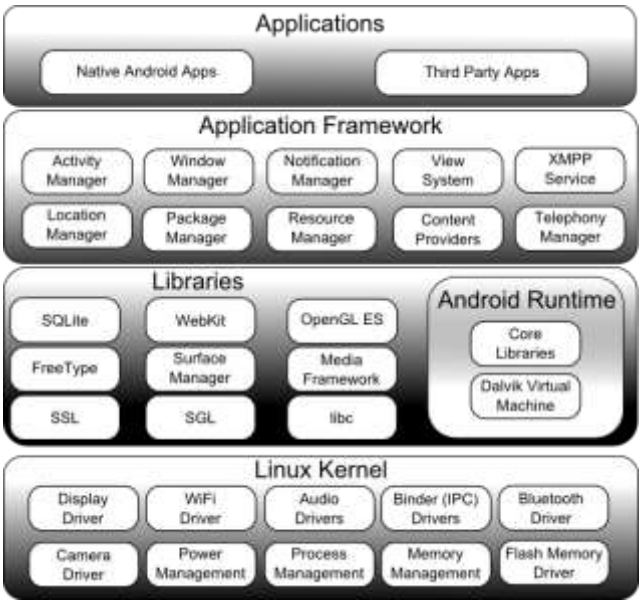
Features of Android

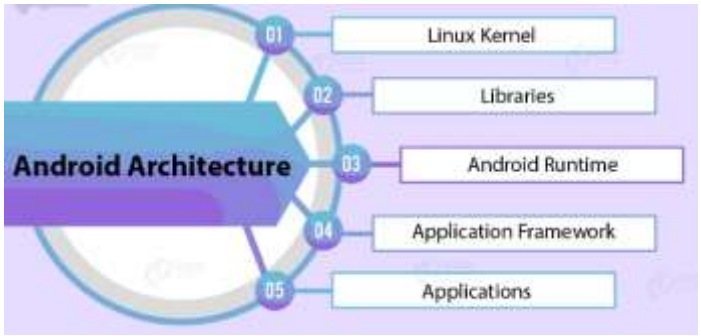
Android is a powerful operating system and supports great features listed below :

- Beautiful UI
- Connectivity
- Media support
- Multitasking
- Resizable widgets
- Wi-Fi Direct
- Web browser

What is Android Architecture?

- It is a mobile operating system that has an open-source framework and is based on Linux
- Android Architecture helps us to develop advanced and user-friendly applications.
- Android Architecture, divide into five levels, which are the '
  1. Linux kernel,
  2. Libraries,
  3. Application framework,
  4. Android runtime, and
  5. System applications.





Android SDK :

- Android SDK stands for Android Software Development Kit.
- It is developed by Google for Android Platform.
- With the help of Android SDK, we can create android Apps easily.
- Android SDK is a collection of libraries and Software Development tools that are essential for Developing Android Applications.
- Whenever Google releases a new version or update of Android Software, a corresponding SDK also releases with it.

SDK tools

- SDK tools are platform independent and are required no matter which android platform you are working on.
- The list of SDK tools has been given below –

Tool	Description
android	This tool lets you manage AVDs, projects, and the installed components of the SDK
ddms	DDMS stands for Dalvik debug monitor server, this tool debug Android applications.
emulator	This tools let you test your applications without using a physical device
proguard	Shrinks, optimizes, and obfuscates your code by removing unused code
traceview	Provides a graphical viewer for execution logs saved by your application
Adb	Android Debug Bridge (adb) is a versatile command line tool that lets you communicate with an emulator instance or connected Android-powered device.

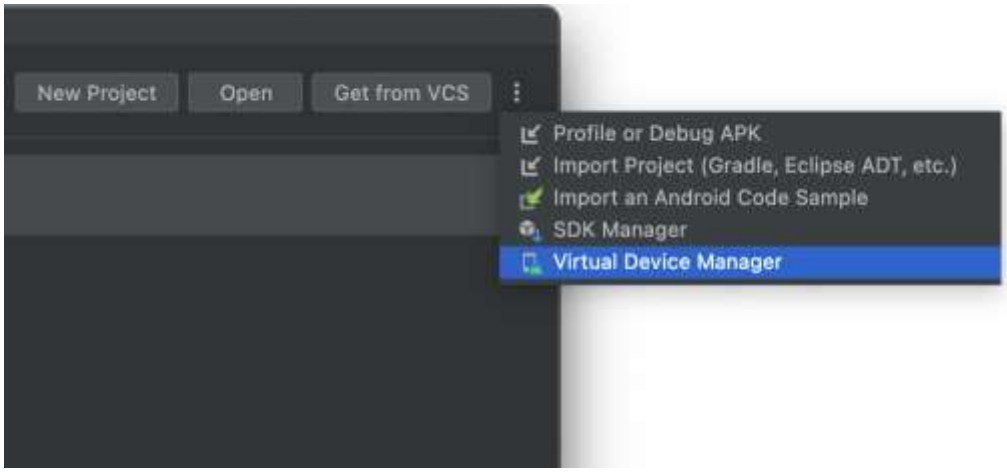
What is AVD?

- AVD stands for Android Virtual Devices.
- An AVD contains a hardware profile, system image, storage area, skin, and other properties.
- An AVD is a configuration that defines the characteristics of an Android phone, tablet etc.
- The Device Manager is a tool you can launch from Android Studio that helps you create and manage AVDs.

Creating Android Virtual Devices (AVD)":

To open the new **Device Manager**, do one of the following:

- From the Android Studio Welcome screen, select **More Actions > Virtual Device Manager**.
- After opening a project, select **View > Tool Windows > Device Manager** from the main menu bar, and then click **Create device**.

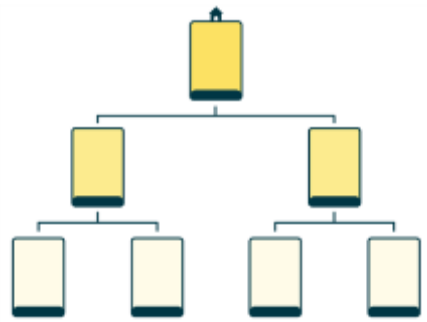


Mobile information architecture :

- Mobile information architecture are used in the context of mobile design.
- MIA has two primary concerns:
  1. Identify and define the content and functionality that exist within mobile interfaces.
  2. Determine how different pieces of content within mobile interfaces relate to each other.

Information architects create content structure by:

- Classifying mobile content
- Auditing content for quality
- Establishing user-centric relationships between content
- Generating navigation components that make content easier to find



Mobile Ecosystem :

- Mobile ecosystem is a collection of multiple devices(Mobile, Tablet etc.), software(OS, development tool, testing tool etc.), companies(Device manufacturer, app development, testing companies)and the process(sms, transaction etc.) by which data is transferred/shared by a user from one device to another device or by the device itself.
- Data sharing can be done between devices of the same operating system or different operating system.