

Assignment No. 1

Q.1 a) What is android?

→ (1) Android is a mobile operating system that was developed by Google, to be primarily used for touchscreen devices, such as phones and tablets.

(2) Android is a Linux-based mobile operating system.

(3) Different version of android are kitkat, lollipop, marshmallow, nougat, oreo, pie etc..

(4) The source code for Android is available under free and open source software licenses.

(5)

```
graph TD; A[Android] --> B[Open Source]; A --> C[Large developer and community reach]; A --> D[Increased marketing]; A --> E[Higher success ratio]; A --> F[Rich development environment]
```

(6) Features of android are:

- Beautiful UI
- Connectivity
- Storage
- media support
- messaging
- web browser
- multi-touch
- multi-tasking
- multi-language
- wifi direct etc..

Q.1 b) Explain SDK & their tools.

- ① SDK stands for Software Development Kit, which is a collection of development tools, which can be used to create and develop application for a specific device or os.
- ② It enables a programmer to develop application for specific platform.
- ③ SDKs are specific to a hardware platform and OS combination.
- For example : windows + SDK, mac os x SDK and etc.
- SDK typically comprises one or more application programming interface (APIs) to ensure that the API provided is implemented correctly.

a) Android SDK / Build - Tools :-

They are used for building actual binaries of android app. The main function are build, run and test application.

b) Android Emulator :-

It is a device that stimulates an android device on your system. The virtual android device is shown in the screenshot above. But there is one disadvantage of this emulator is that it is very slow when system has less RAM.

i) Android SDK platform-tools

It is helpful when we are working on project, and they will show the error message at the same time.

ii) Android SDk tools

It is component of SDK tools. It consist of a set of tools which and other utilities which are crucial for the development of android application.

(f.2 a) Desire Eclipse

→ ① Eclipse is a standard package that well suits for java and plug-in development and adding new plugins.

② Eclipse is mostly written in Java, thus it's primarily used for Java.

③ Eclipse has its own workspace and an extensible plug-in system to customize the environment.

④ It is simple, portable and has a short build time.

⑤ It primarily supports java but can also works for different languages like C, C++, C#, PHP and Ruby.

⑥ The developer of Eclipse was Eclipse Foundation.

⑦ It supports Android through plugin not extension.

Q.2 b) Explain Android manifest file;

- ① Every project in android includes a manifest file, which is `AndroidManifest.xml`, located in the root directory of its project hierarchy.
- ② It defines the structure and metadata of our application, its component and its requirements.
- ③ This file includes rules for each of the activities, services, content providers and broadcast receivers that make the application.
- ④ The manifest file also specifies the application metadata, which includes its icon, version no., themes etc. and additional top-level nodes say specify any required permission and config test, define hardware, screen or platform requirements.
- ⑤ It should also include an `xml:android` attribute that will supply several system attributes used within the files.
- ⑥ A manifest file includes the nodes that define the application component, security setting, test cases and requirements that make up the application.
- ⑦ Some of the manifest sub-node tags that are mainly used are:
 - manifest
 - user permission
 - user library
 - uses-sdk
 - application
 - activity

- intent - filter
- action
- category
- user - configuration
- user - features
- permission

Q. 3 (a) List the Android Technologies.

→ * List of Back-end Technologies:

① programming language: →

- Python
- Java
- Javascript
- PHP

② Databases: →

- MongoDB
- MySQL

③ Framework: →

- Ruby on Rails
- Flask
- Django
- Swift

④ service providers: →

- Apache
- Nginx

* Front-end Technologies Stack:

① Technology stack for Native Apps: →

a) Android App development Tech stacks:

- Java
- Kotlin
- SDK

b) iOS App development Technology Stack

- swift
- objective
- Toolset - (a) Xcode
- App Code
- iOS SDK

② Technology stack for hybrid Apps: →

- Ionic
- Apache cordova | Adobe phonegap

③ Technology stack for cross-platform apps: →

- React native
- TypeScript
- Kamarmi

Q. 3 b) write Notes on:

i) Application context

- ① It is an instance that uses the singleton and can be accessed in activity via `getApplicationContext()`.
- ② This context is tied to the lifecycle of an application.
- ③ The application context can be used where you need a context whose lifecycle is separate from the current context or when you are passing a context beyond the scope of activity.
- ④ Some use cases of Application context are:
 - If it is necessary to create a singleton object.
 - During the necessity of a library in an activity.
- ⑤ List of functionalities of Application context:
 - Load Resource Values.
 - Start a Service.
 - Bind to a Service.
 - Send a Broadcast.
 - Register BroadcastReceiver.

ii) Activities: →

- ① An activity is the single screen in android. It is like window or frame of Java.
- ② By the help of activity, you can place all your UI components or widgets in a single screen.
- ③ Android Activity lifecycle is controlled by 7 methods of `android.app.Activity` class.
- ④ The android activity is the subclass of `ContextThemeWrapper` class.

Object



Context



ContextWrapper



(ContextThemeWrapper)



Activity

iii) Services →

- ① services in android are a special component that facilitates an application to run in the background in order to perform long-running operation tasks.
- ② The prime aim of service is to ensure that the application remains active in background so that the user can operate multiple application at a same time.

③

Foreground

services

Android
Services

Background

Services

Round

Services

a) Foreground services : →

Services that notify the user about its ongoing operation are termed as foreground services such as in downloading a file, the user can keep track of the progress in downloading and can also pause and resume the process.

b) Background services : →

It does not require any user intervention, user cannot access them. The process will be scheduled by the system.

c) Bound services : →

It allows the component of application like activity to bind themselves with it. In order to bind an application component with service bindService() method is used.

Q4 a) Explain Intent and Intent types.

→ (1) The android Intent is a messaging object which is used to request an action from another app component.

(2) It will help us to maintain the communication between the app component from the same application as well as the component of other application.

(3) There are two types of intent, they are:

a) Explicit Intent

b) Implicit Intent

Q) Explicit Intent : → ↳ Intent Intent

It's going to connect the intended code of an application such as start activity or send data between two activities. It specifies the component.

b) Implicit Intent : → ↳ Intent Intent

It doesn't specify the component. It provides information on available component provided by the system without it needs to be invoked.

Q.4(b) Describe receiving and broadcasting Intent.

→ ① You can broadcast an intent object (via `Context` call to `broadcastIntent()`) to the Android system, and many applications interesting can receive that broadcast (caused a `BroadcastReciever`).

② These type of intent objects are generally used to inform the greater system that something interesting has happened and we Special Intent Action type.

③ For example, the intent action `action battery_low` broadcasts a warning when the battery is low.

④ There are also broadcast Intent objects for other interesting system events such as SD card state changes, application removed etc.

⑤ Broadcast intents are intent object that are broadcast via a call to the `sendBroadcast()`, `sendStickyBroadcast()` method of the activity class.

⑥ Broadcast intents are a mechanism by which an intent can be issued for consumption by multiple component on Android system

⑦ The receiving component consumes this information via `getAction()` and `getExtras()` method on Intent object.

⑧ To handle the content delivered by an intent, call `getIntent()` to get the Intent object.

Q.5 a) Explain Activity Lifecycle of Android.

→ ① Android Activity Lifecycle is controlled by 7 methods of `android.app.Activity` class.

② The android activity is the subclass of `ContextThemeWrapper` class.

③ The 7 lifecycle method of activity describes how activity will behave at different states.

④

Object
↑

context
↑

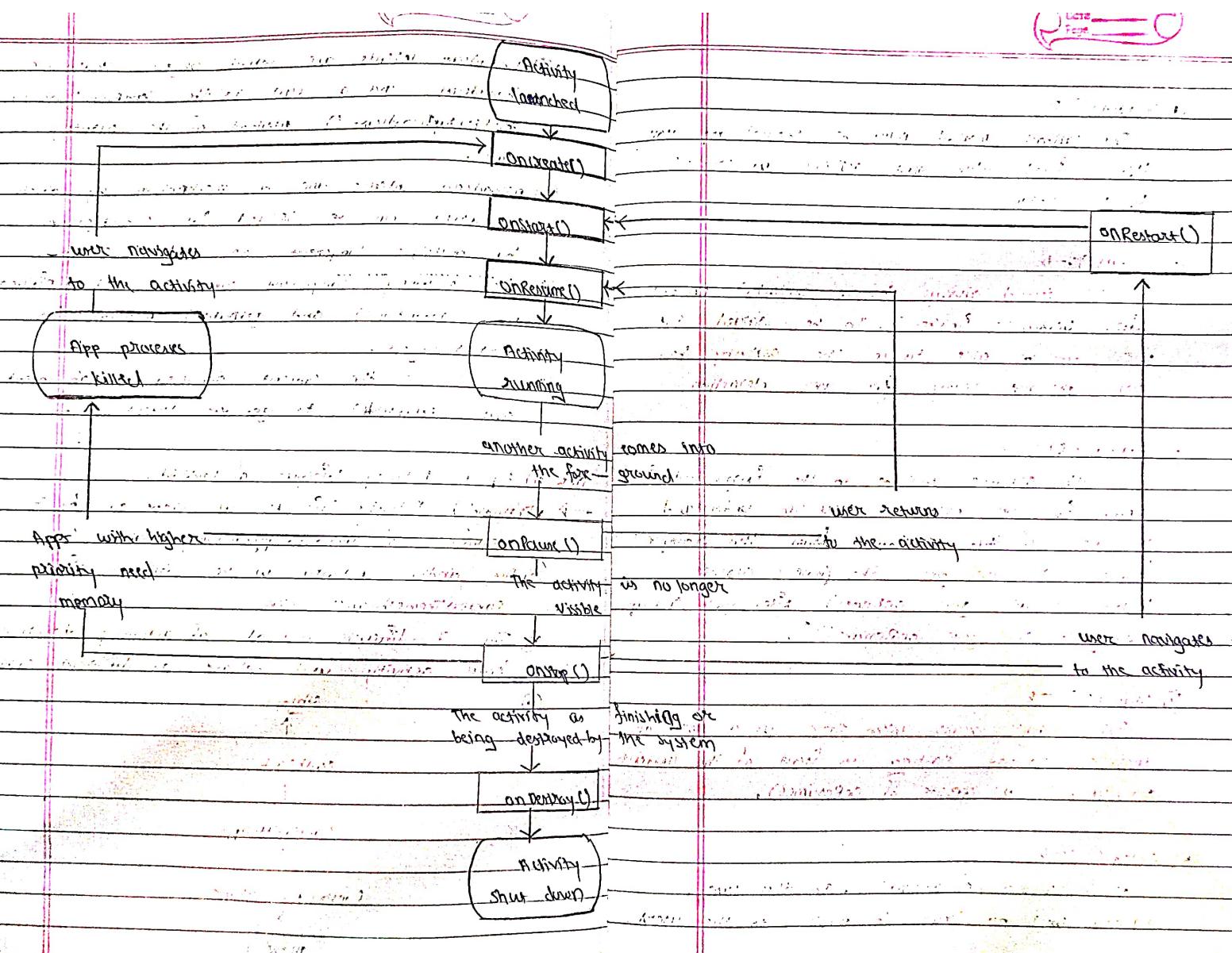
↑

ContextWrapper
↑

↑

ContextThemeWrapper
↑

Activity



① OnCreate(): →

This callback method must be created by you. This is fired when your activity is created by the system.

② OnStart(): →

There should always be an Onstart() callback after OnCreate() finishes. In the started state users will be able to see the activity but they are not ready for user interaction.

③ OnResume(): →

In this, activities will be in the foreground & ready for user interaction. You can understand the use of this callback from this example:

"when the user presses the phone's answer button it will give OnResume() after you end up calling it will give OnResume()",

④ onPause(): →

This callback occurs when there is a case of another activity starting in front of the current activity. It is opposite of OnResume().

⑤ OnStop(): →

It is opposite of Onstart(). In this case, activity will no longer be visible to the user.

⑥ OnRestart : →

This occurs when the activity is stopped and before the activity starts again. It is less common callback.

⑦ OnDestroy : →

It is opposite of OnCreate(). This gets triggered when the system needs to free memory or when finish() is called. It is used for cleanup, which is a very common activity.