**Android Interview Questions**

## What are the advantages of Android?

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| **Advantages of Android** | |
| **Advantage** | **Description** |
| ***Modest & Potent*** | It is modest and potent SDK (Software Development Kit) and importantly it is open source, meaning that Licensing, Distribution or Development fee is not required. |
| ***Easy*** | Easy to Import third party Java library. |
| ***Multi-platform Support*** | Android Supports platforms such as Linux, Mac Os, Windows. |
| ***Useful Products*** | Ground-breaking products like Location-Aware services, location of a nearby convenience store etc. are quite helpful. |
| ***Reusable*** | Components of Android can be reused and replaced by the application framework. Has optimized DVM for mobile devices. SQLite enables to store the data in a structured manner. |
| ***Technology Support*** | Android Supports GSM telephone and Bluetooth, WI-Fi, 3G and EDGE technologies. The development is a combination of a device emulator, debugging tools, memory profiling and plug-in for Eclipse IDE. |

## What are the different phases of the Activity life cycle?

As an activity transitions from state to state, it is notified of the change by calls to the following protected methods:

* void onCreate(Bundle savedInstanceState)
* void onStart()
* void onRestart()
* void onResume()
* void onPause()
* void onStop()
* void onDestroy()

These seven methods define the entire lifecycle of an activity.

## What is an Explicit Intent?

In an explicit intent, the activity that is required to respond to the intent is specified. To be precise, the target components are explicitly designated. This is typically used for application internal messages.

## What is an Implicit Intent?

In an implicit intent, only the intent is declared and the activity that can respond to the intent is left to the platform. Here the target component is not declared, hence it is usually used for activating components of other applications as well.

## What is an AndroidManifest file?

Applications confirm their components like the .apk file that also holds the application’s code, files, and resources in a manifest file that’s bundled into the Android package. The manifest is a structured XML file and is always named AndroidManifest.xml for all applications. It is also used for naming libraries the application that needs to be linked and identifying any permissions the application expects to be granted.

## What’s the difference between a file, a class and an activity in android?

* ***File –***It is a chunk of arbitrary information, or resource for storing information.
* ***Class*** – It’s a compiled form of Java file. Android uses the .class files to produce an executable apk
* ***Activity*** – An activity is the comparable to a Frame/Window in GUI toolkits. It is not a file or a file type it is just a class that can be extended in Android for loading UI elements on view.

## What is the significance of the .dex files?

Android programs are compiled into ‘.dex’ (Dalvik Executable) files, which are zipped into a single .apk file on the device. ‘.dex’ files can be created by translating compiled applications written in Java.

## What does ADT stand for?

ADT stands for Android Development Tools. The Android SDK contains several tools and utilities to help create, test and debug your projects.

## What are the different tools in Android and explain them?

#### The Android SDK and Virtual Device Manager:

It is used to create and manage Android Virtual Devices (AVD) and SDK packages. The AVD holds an emulator, letting you specify supported SDK version, screen resolution, SD card storage available and available hardware abilities such as touch screens and GPS.

#### The Android Emulator:

Android Emulator is an implementation of the Android virtual machine designed to run within a virtual device on the development computer. It is used for testing and debugging Android applications.

#### Dalvik Debug Monitoring Service (DDMS):

The DDMS is used to monitor and control the Dalvik virtual machines on which the applications are being debugged.

#### Android Asset Packaging Tool (AAPT):

Builds the distributable Android package files ‘.apk’

#### Android Debug Bridge(ADB):

Android Debug Bridge is a command-line debugging application distributed along with the SDK. It provides tools to browse the device, copy tools and forward ports for debugging.

## What is Dalvik Virtual Machine?

Dalvik is the name of Android’s virtual machine. The Dalvik VM is an interpreter-only virtual machine that executes files in the Dalvik Executable (.dex) format, a format that is optimized for effective storage and memory-mappable executions. The virtual machine is register-based and can run classes compiled by Java language compiler that have been altered into its native format using the included ‘dx’ tool. The VM runs on top of Posix-compliant operating systems depending on it for performing threading and low level memory management functionalities. The Dalvik core class library is envisioned to provide a familiar development base for those used to programming with Java Standard Edition, but is geared explicitly for the needs of a small mobile device.

## What is Android Runtime?

Android comprises of a set of core libraries that provides most of the functionality available in the core libraries of the Java. All Android application runs in its own process, with its own instance of the Dalvik virtual machine. Dalvik has been written in order for the device to run multiple VMs competently. The Dalvik VM executes files in the Dalvik Executable (.dex) format which is boosted for minimal memory footprint. The VM is register-based, and runs classes compiled by a Java language compiler that have been transformed into the ‘.dex’ format by the included ‘dx’ tool.

## What is the Open Handset Alliance?

The OHA is a conglomerate of 84 technologies and mobile companies that have joined hands to fast-track innovation in mobile technology and at the same time, offer the end users an improved, cost-effective and richer mobile experience. Members of this alliance include Google, HTC, Sony, Dell, Intel, Motorola, Qualcomm, Texas Instruments, Samsung, LG, T-Mobile, Nvidia. The OHA was started on 5th November, 2007 by Google and 34 other companies. Android is the main software of this alliance.

## What is a Service?

A Service is an application component representing either an application’s intent to perform a longer-running operation without interacting with the user or to provide functionality for other applications to use. Services run without a dedicated GUI, but like Activities and Broadcast Receivers, they are executable in the main thread of the application’s process. A Service could be a facility for an application to expose some of its functionality to other applications.

## What is the difference between Service and Thread?

Service is like an Activity but has no interface. For example, for fetching information on weather, blank activity will not be created. Here Service will be used. It is also known as Background Service because it performs tasks in background.

A Thread is a concurrent unit of execution. Take note that the UI cannot be updated from a Thread. For this a Handler must be used.

## What is a Toast Notification?

Toast notification is a message that pops up on the window. It only covers the expanse of space required for the message and the user’s recent activity remains visible and interactive. The notification automatically fades in and out and does not accept interaction events.

## What are the other Notifications?

The other notifications are:

* ***Status Bar Notification:*** Used for persistent reminders that originate from the background and request for user’s response.
* ***Dialog Notification:*** Used for Activity-related notifications.

## What is the significance of XML-based layouts?

XML-based layouts provides consistent and somewhat a standard means of setting GUI definition format. As a general practice, the layout details are placed in XML files, whereas other items are placed in source files.

## What are Containers?

Containers hold objects and widgets together, depending on which specific items are needed and in what particular arrangement. Containers may hold labels, fields, buttons, e.t.c

## What are the drawbacks of Android?

Android is an open-source platform and at the same time different Operating Systems have been released for different mobile devices. This provides no clear picture on how applications can adapt with different OS versions and upgrades. An app that runs on a particular version of Android OS may or may not run on another.

Another limitation is that, mobile devices comes in different size and forms. Here it becomes a challenge for developers to create apps that can auto-correct to the right screen and other feature of that particular mobile device.

## What is ADB?

ADB is abbreviation of Android Debug Bridge. It provides developers the power to execute remote shell commands. Its basic function is to allow and control communication, to and fro from the emulator port.

## What are the four essential states of an activity?

* ***Active*** – If the Activity is in the foreground.
* ***Paused*** – If the Activity is in the background and is still visible.
* ***Stopped*** – If the Activity is not visible, therefore is hidden or concealed by another Activity.
* ***Destroyed*** – When the Activity process is completed terminated.

## What is ANR?

ANR is the acronym for Application Not Responding. This is a dialog that appears to the user whenever an application has been unresponsive for an extended period of time.

## How are escape characters used as attribute?

Escape characters when preceded by double backslashes can be used as an attribute. For example, a newline character is created using ‘\\n’

## When does other qualifiers in multiple source take precedence over Locale?

This happens at two instances: MCC (mobile country code) and MNC (mobile network code) qualifiers.

## What is the correct way of setting up an Android-powered device for app development?

The following are steps need to be followed prior to actual application development in an Android-powered device:

* Declare application as “debuggable” in Android Manifest.
* Turn on “USB Debugging” on your device.
* Set up system to detect your device.

## What are the steps involved in creating a bounded service through AIDL?

* Create the ‘.aidl’ file which defines the programming interface
* Implement the interface by extending the inner abstract Stub class as well as embedding its methods.
* Describe the interface by implementing the Service to the clients.

## What are the different data types supported by AIDL?

String, CharSequence, List and Map. All built-in Java data types like Int, Long, Char and Boolean are also supported by AIDL

## What is a Fragment?

A fragment is a portion of an activity. It is flexible in a sense that it can moved around or combined with other fragments in a single activity. Fragments are also reusable.

## Can Fragments be added without using a User Interface?

Yes, this can be done when creating a background behaviour for a particular activity. This can be done by using add (Fragment, string) method to add a fragment from the activity.

## How to remove icons and widgets from the main screen of an Android device?

To remove an icon, press and hold that icon. Then drag it towards the lower part of the screen where the remove button appears.

## Do all mobile phones support the latest Android Operating System?

Some Android phones lets you to upgrade to higher Operating System version. However, not all upgrades allows you to get the latest version. It depends mainly on whether it can support the newer features available in the latest version.

## What is a Portable Wi-Fi Hotspot?

Portable Wi-Fi Hotspots allow you to share your mobile internet connection with other wireless devices. For example, your Android-powered phone can be used as a Wi-Fi Hotspot to make your laptop connect to the internet.

## What is the variance between a regular Bitmap and a Nine-Patch image?

A Nine-patch image allows resizing. The Nine-patch refers to the way you can resize the image: 4 corners that are unscaled, 4 edges that are scaled in 1 axis, and the middle one that can be scaled into both axes.

## What are the exemptions in Android?

* ***InflateException :*** When an error conditions occur this exception is thrown.
* ***Surface.OutOfResourceException:*** When a Surface is not created or resized, this exception is thrown.
* ***SurfaceHolder.BadSurfaceTypeException***: When invoked on a Surface ‘SURFACE\_TYPE\_PUSH\_BUFFERS’, this exception is thrown from lockCanvas() method.
* ***WindowManager.BadTokenException:*** This exception is thrown at the time of trying to view an invalid WindowManager.LayoutParamstoken.

# 1. What is an Android Framework?

Android Framework is an essential part of the Android Architecture. It is a set of APIs that allows developers to write apps and has the following components:

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| --- | --- |
| **Android Framework Components** | |
| ***Services*** | Components that conduct long-running operations in the background, without the inclusion of a user interface. |
| ***Intent*** | Objects that initiate actions from other app components, either within your program (explicit intents) or through another piece of software on the device (implicit intents). |
| ***Activities*** | Components that provide users with screens on which they can interact with objects and perform actions. This is the base from which Intents can be deployed. |
| ***Content Providers*** | Components that enable users to access data within an app such as audio, video, images, contact information etc. |
| ***Others*** | App widgets and Processes and Threads |

# 2. What is the Android Architecture?

Android architecture refers to the different layers in the Android stack. The four layers in the Android stack are:

* Linux Kernel
* Libraries
* Android Framework
* Android Applications

You can find more information about Android layers, stack and their functions in [this](https://www.edureka.co/blog/beginners-guide-android-architecture/) blog post.

# 3. What is the difference between File, Class and Activity in android?

The difference between them are as follows:

* **File** is a block of arbitrary information or resources for storing information. It can be any file type.
* **Class** is a compiled from of .Java file which Android uses to produce an executable apk.
* **Activity** is the equivalent of a Frame/Window in GUI toolkits. It is not a file or a file type but just a class that can be extended in Android to load UI elements on view.

# 4. What is APK format?

The APK file or Android application package is the compressed file format that is used to distribute and install application software and middleware onto Google’s Android operating system. The file has .apk extension and has all the application code, resource files, certificates, and other files, compressed in it.

# 5. What is Google Android SDK?

The Google Android SDK is a tool set that provides a developer the API libraries and tools required to build, test, and debug apps for Android in Windows, Mac or Linux.

# 6. What is an ANR? How can ANR be prevented?

ANR stands for ‘Application Not Responding’. This dialogue is displayed if the main thread in the application has been unresponsive for a long time and in the following conditions:

* When there is no response to an input event after 5 seconds.
* When a broadcast receiver is not done executing within 10 seconds.

One technique is to create a child thread to prevent the Android system from concluding a code that has been unresponsive for a long period of time. Most of the actual workings of the codes can be placed within the child thread to ensure that the main thread runs with minimal unresponsive time.

# 7. How do you launch an activity in your application?

An activity can be launched by creating an explicit intent that defines the activity that we want to launch. In the below code snippet, the first parameter to Intent constructor is the current activity context and the second parameter is the new activity class. startActivity() method can be called on Activity context.

Intent intent = new Intent(this, SecondActivity.class);

startActivity(intent);

# 8. What is the use of WebView in Android?

WebView is a view that display web pages inside your application. According to Android, “this class is the basis upon which you can roll your own web browser or simply display some online content within your Activity. It uses the WebKit rendering engine to display web pages and includes methods to navigate forward and backward through a history, zoom in and out, perform text searches and more.”

In order to add WebView to your application, you have to add **<WebView>**element to your xml layout file.

# 9. What are the different kinds of context in Android?

Context defines the current state of an App. Context provides access to creating new activity instance, access databases, start a service, etc. There is a base class ApplicationContext, and sub classes for components: Activity, Service.

# 10. What are the different storage methods in Android

Android offers several options to save persistent application data. They are:

* Shared Preferences – Store private primitive data in key-value pairs.
* Internal Storage – Store private data on the device memory
* External Storage – Store public data on the shared external storage
* SQLite Databases – Store structured data in a private database.

# 11. What are the tools required to develop Android Apps?

The tools required are:

* JDK
* Eclipse + ADT plugin
* SDK Tools

You can also use Android Studio by Google.

# 12. What is Intent?

An Intent is an “intention” to do an action.

According to Android, “An Intent is a messaging object you can use to request an action from another app component.” There are three use cases for Intent:

* To start an activity
* To start a service
* To deliver a broadcast

There are two types of Intent in Android:

* Implicit Intent
* Explicit Intent

# 13. What is a Sticky Intent?

A Sticky Intent is a broadcast from sendStickyBroadcast() method which floats around even after the broadcast, allowing others to collect data from it.

# 14. Explain Folder, File & Description of Android Apps

* **src**: contains the .java source files for your project.
* **gen**: contains the .R file, a compiler-generated file that references all the resources found in your project.
* **bin**: contains the Android package files .apk built by the ADT during the build process and everything else needed to run an Android application.
* **res/drawable-hdpi**: this is a directory for drawable objects that are designed for high-density screens.
* **res/layout**: this is a directory for files that define your app’s user interface.
* **res/values**: this is a directory for other various XML files that contain a collection of resources, such as strings and colors definitions.
* **AndroidManifest.xml**: this is the manifest file which describes the fundamental characteristics of the app and defines each of its components.

# 15. How to ‘Start Another Activity’?

Intent i = new Intent(getApplicationContext(), Activity2.class);  startActivity(i);

# 16. What is AAPT?

AAPT is short for Android Asset Packaging Tool. This tool provides developers with the ability to deal with zip-compatible archives, which includes creating, extracting as well as viewing its contents.

# 17. What are containers?

Containers, holds objects and widgets together, depending on which specific items are needed and in what particular arrangement that is wanted. Containers may hold labels, fields, buttons, or even child containers.

# 18. What are some of the disadvantages of Android?

Android being an open-source platform, and considering that different Android operating systems have been released on different mobile devices, there’s no clear cut policy to how applications can adapt with various OS versions and upgrades. An app that runs on one version of Android OS may or may not run on another version.

Another disadvantage is that it can be challenging for developers to create apps that can adjust correctly to the right screen size and other varying features and specs of various Android devices.

# 19. Name the four essential states of an activity

The four essential states of an activity are:

* Active – if the activity is at the foreground
* Paused – if the activity is at the background and still visible
* Stopped – if the activity is not visible and therefore is hidden or obscured by another activity
* Destroyed – when the activity process is killed or completed terminated

# 20. What is the difference between a regular bitmap and a nine-patch image?

A nine-patch image, unlike bitmap, can be resized and used as background or other image sizes for the target device. The Nine-patch refers to the way you can resize the image: 4 corners that are unscaled, 4 edges that are scaled in 1 axis, and the middle one that can be scaled into both axes. This is what differentiates a nine-patch image from a regular bitmap.

# 21. Which language is supported by Android for application development?

The main language that is supported for Android app development is Java programming language. Java is the most popular language for app development, which makes it ideal even for new Android developers to quickly learn to create and deploy applications in the Android environment.

# 22. What are the dialog boxes that are supported in Android?

Android supports four dialog boxes:

* AlertDialog: An alert dialog box supports zero to three buttons and a list of selectable elements, including check boxes and radio buttons. Among the other dialog boxes, the most suggested dialog box is the alert dialog box.
* ProgressDialog: This dialog box displays a progress wheel or a progress bar. It is an extension of AlertDialog and supports adding buttons.
* DatePickerDialog: This dialog box is used for selecting a date by the user.
* TimePickerDialog: This dialog box is used for selecting time by the user.

# 23. Give an example for sticky broadcast.

Here’s an example: When you call registerReceiver() for that action — even with a null BroadcastReceiver — you get the Intent that was last broadcast for that action. Hence, you can use this to find the state of the battery without necessarily registering for all future state changes in the battery.

# 24. What is DDMS?

DDMS stands for Dalvik Debug Monitor Server. It gives the following array of debugging features:

* Port forwarding services
* Screen capture
* Thread and heap information
* Network traffic tracking
* Location data spoofing

# 25. Name some exceptions in android?

* Inflate Exception
* Surface.OutOfResourceException
* SurfaceHolder.BadSurfaceTypeException
* WindowManager.BadTokenException

## What‘s the Last Project you Worked on in Your Spare Time Without Pay?

* **What Most People Say:** Um… I worked on one two years ago.
* **What You Should Say:** I was working on an open source app last night. Would you like to hear about it?
* **Why You Should Say it:** *“The fact that you want to program in your spare time and voluntarily upgrade your skills communicates passion and hunger,”*says Unger, who describes this as a black and white question with only one acceptable answer.

## Why Does Every Fragment Need a Default Parameter-less Constructor?

* **What Most People Say:** I’ve always done it that way.
* **What You Should Say:** The FragmentManager uses the default constructor when recreating Fragments across orientation changes and also during other times, such as to support dynamic and flexible UI designs on large screens.
* **Why You Should Say it:** *“This is a relatively easy question that illustrates if someone has table-stakes knowledge of Android,”* Unger explains. *“Your answer should show that you’re cognizant of the need and purpose of flexible layouts.”*

*“There are tons of screen sizes on the market, and flexing the size is more difficult,”* Unger says. *“You need to show that you understand how the language works. And you can’t do that by simply regurgitating canned answers or blindly following instructions.”*

## Do Multiple AsyncTasks Run in Parallel or Serially?

* **What Most People Say:** They run in parallel or they run serially (but they don’t explain why).
* **What You Should Say:** It depends. On early Android, AsyncTasks were run serially. Then in Donut, this changed to multiple threads running in parallel. But in Honeycomb, AsyncTasks run on a single thread by default, though they can be overridden using the special .executeOnExecuter() method.
* Why You Should Say it: Unger admits that this is a difficult question, as you need experience with several versions of Android to answer it. Most of today’s Android developers weren’t coding before Donut, he notes. Additionally, even an experienced Android developer could easily forget to mention the .executeOnExecuter() method.

## More Tips from Ryan Unger:

* Any time the situation is grey or you don’t understand the question, ask for more specifics before providing an answer.
* Demonstrate your technical knowledge by providing several answers.
* “Flipping the script” on the interviewer shows hunger and drive.
* If you are not aware of the answer to a question, admit it. Just be sure to exhibit your professional curiosity by asking for the answer.

## Words of Wisdom by Ryan Unger:

*“The difference between an intermediate engineer and an advanced engineer is that, the advanced engineer can tell you why it’s done that way”*

*“They don’t simply copy and paste code from Stack Overflow when they’re stumped. They dig deeper to find out why the code is written that way.”*