

2. Learn The Fundamentals

So it's good you chose a programming language (Java). Now before going further, you should learn the fundamentals of Java and android.

Java Programming Basics

Java is one of the most popular and widely used programming language and platform. A platform is an environment that helps to develop and run programs written in any programming language.

Java is fast, reliable and secure. From desktop to web applications, scientific supercomputers to gaming consoles, cell phones to the Internet, Java is used in every nook and corner.

However to become proficient in any programming language, one Firstly needs to understand the basics of that language.

Therefore, below are the basics of Java in the format in which it will help you the most to get the headstart:

1.) Java Environment: The programming environment of Java consists of three components mainly:

- JDK
- JRE
- JVM

2.) Java Basic Syntax: Every programming language has its own set of rules to declare, define and work on its components. Reading and learning about all of them together is difficult. Therefore here is a simple task of printing “Hello World” in Java. During this process, major components and their syntaxes are explained clearly.

3.) Comments in Java: In a program, comments take part in making the program become more human-readable by placing the detail of code involved and proper use of comments makes maintenance easier and finding bugs easily. Comments are ignored by the compiler while compiling the code.

4.) Data Types in Java: Each variable in Java has an associated data type. Each data type requires different amounts of memory and has some specific operations which can be performed over it.

5.) Variables in Java: A variable is the name given to a memory location. It is the basic unit of storage in a program.

6.) Keywords in Java: Keywords or Reserved words are the words in a language that are used for some internal process or represent some predefined actions. These words are therefore not allowed to use as variable names or objects. Doing this will result in a compile-time error.

7.) Operators in Java: Operators are the foundation of any programming language. Thus the functionality of Java programming language is incomplete without the use of operators. We can define operators as symbols that help us to perform specific mathematical and logical computations on operands. In other words, we can say that an operator operates the operands.

8.) Decision Making (Control Statements) in Java: Decision Making in programming is similar to decision making in real life. In programming also we face some situations where we want a certain block of code to be executed when some condition is fulfilled.

A programming language uses control statements to control the flow of execution of the program based on certain conditions. These are used to cause the flow of execution to advance and branch based on changes to the state of a program.

9.) Loops in Java: Looping in programming languages is a feature which facilitates the execution of a set of instructions/functions repeatedly while some condition evaluates to true.

Java provides three ways for executing the loops. While all the ways provide similar basic functionality, they differ in their syntax and condition checking time.

10.) OOPs (Object-Oriented Programming System):

Object means a real-world entity such as a pen, chair, table, computer, watch, etc. Object-Oriented Programming is a methodology or paradigm to design a program using classes and objects. It simplifies software development and maintenance by providing some concepts:

- Object
- Class
- Inheritance
- Polymorphism
- Abstraction
- Encapsulation

Apart from these concepts, there are some other terms which are used in Object-Oriented design:

- Coupling
- Cohesion
- Association

- Aggregation
- Composition
- Java OOPs Concepts

Android Basic Terms & Their Meaning

Android Hardware

Hardware is the physical “hard” components of the phone, like the screen, battery, processor and motherboard, or even more obscure hardware devices like accelerometers, gyroscopes, proximity sensors, etc. The software is the intelligence that makes the phone run, manages all of the input/output, and runs the apps (in this case Android).

Android Software

Software is the intelligence that operates the hardware, manages all of the input/output, and runs the apps. It’s the brain of the device.

Android Source Code Modification

Because the Android source code is modifiable by companies selling the phones, the actual user interface from device to device will vary as well. Depending on the brand of phone and when it was purchased the default UI may differ.

Android Software Development Kit

The Android Software Development Kit contains the libraries and tools you need to develop Android Apps.

Android Studio

Android Studio is an Integrated Development Environment (IDE) created by Google which is used to develop Android apps. Android Studio is a program specifically designed to make developing Android Apps easier, it helps to streamline development, and contains useful tools like a visual layout editor, a debugging suite, and a collection of device emulators to test your apps on. It also has the ability to load your app up on a real android device, and package your app for deployment to the Google Play Store.

How to Write Android Apps

Android apps are developed in one of two programming languages, either Java or Kotlin. Apps also utilize Extensible Markup Language (XML) which is used to describe data resources, build configuration files, and describe the UI of apps.

Android Virtual Devices

The Android emulator allows you to run your app on an Android Virtual Device (AVD), which behaves just like a physical Android device. You can set up numerous AVDs, each emulating a different type of device.

Integrated Development Environment

Android Studio is the official integrated development environment for Google's Android operating system, built on JetBrains IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems. It is a replacement for the Eclipse Android Development Tools as the primary IDE for native Android application development.

Android Apps

Apps are the main way a user interacts with their android device, they are essentially programs that run on Android and are composed of one or more interactive screens.

Android System Apps

System apps are apps the system has recognized as the default apps to perform common tasks like email, texting, camera stuff, etc.

Java API Framework

The Java API Framework is a set of software libraries and utilities essential for Android Development. This is the layer of the stack that developers will be interacting with and includes things like:

- UI components
- Resource management
- Lifecycle management

Android Runtime

Each application runs on its own instance of the Android runtime (ART). ART is a managed runtime that runs application code.

Think of an Android Runtime as an isolated container where each app lives and carries out its processes. It's kind of like the house where each app lives.

Hardware Abstraction Layer HAL

The hardware abstraction layer (HAL) consists of a number of library modules that manage access to the hardware of an Android device. This hardware includes the camera, audio, Bluetooth connectivity, and various internal sensors. Applications interact with HAL via the Java API framework.

Linux Kernel

The Linux kernel sits at the base of the Android stack. It handles threading, low-level memory management, security, and drivers. Essentially it's the core brain of the operation. Linux is an operating system that can be run on desktop computers as well as phones. It's

the most complicated and most highly developed part of the Android stack and is the main reason something like Android is able to exist.

Gradle Build Tool

Android applications can consist of hundreds or thousands of files worth of code, video, audio and images. These need to be packed in a way that can be understood by the Android device, which is where Gradle comes in. The Gradle tool in Android studio will package everything together in a compressed file called an APK, which can then be distributed and run on Android devices.

Android Emulator

Android Studio also includes a suite of emulators which developers can use to test their apps. It comes pre-packaged with emulators for many of the most popular Android devices in the world.

Package Name

The package name is a unique name to identify a specific app. Generally, the package name of an app is in the format `domain.company.application`, but it's completely up to the app's developer to choose the name. The domain portion is the domain extension, like `com` or `org`, used by the developer of the app. The company portion is usually the name of the developer's company or product. The final application portion usually describes the app itself.