Gradle

In Android Studio, **Gradle** is used for building our android application projects, hence playing the role of a build system. Every android application development tool has to compile resources, java source code, external libraries and combine them into a final APK.

Gradle is a build system, which is responsible for code compilation, testing, deployment and conversion of the code into **.dex** files and hence running the app on the device. As Android Studio comes with Gradle system pre-installed, there is no need to install additional runtime softwares to build our project. Whenever you click on Run button in android studio, a gradle task automatically triggers and starts building the project and after gradle completes its task, app starts running in AVD or in the connected device.

A build system like Gradle is not a compiler, linker etc, but it controls and supervises the operation of compilation, linking of files, running test cases, and eventually bundling the code into an apk file for your Android Application.

There are two build.gradle files for every android studio project of which, one is for application and other is for project level (module level) build files. In the build process, the compiler takes the source code, resources, external libraries JAR files and AndroidManifest.xml(which contains the meta-data about the application) and convert them into .dex(Dalvik Executable files) files, which includes bytecode. That bytecode is supported by all android devices to run your app. Then APK Manager combines the .dex files and all other resources into single apk file.

build.gradle (Module:app)

The Top level (module) build.gradle file is project level build file, which defines build configurations at project level. This file applies configurations to all the modules in android application project. It is used to specify the build configurations for a specific module within the project, such as the dependencies, build tools, and other settings needed to build and run the app.

build.gradle (Project:app)

The Application level build.gradle file is located in each module of the android project. This file includes your package name as applicationID, version name (apk version), version code, minimum and target sdk for a specific application module. When you are including external libraries (not the jar files) then you need to mention it in the app level gradle file to include them in your project as dependencies of the application. It is used to specify global build configurations for the entire project, including the repositories where dependencies can be found and the version of the Android build tools to use.