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BY: Akshat kashyap

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Overview

What is Android?

Android is an open source and Linux-based Operating System for mobile devices such as smart phones and tablet computers.

Android was developed by the Open Handset Alliance **, led by Google, and other companies.**

Android offers a unified approach to application development for mobile devices which means developers need only develop for Android, and their applications should be able to run on different devices powered by Android.

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, at the Google I/O conference, 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.

The source code for Android is available under free and open source software licenses. Google publishes most of the code under the Apache License version 2.0 and the rest, Linux kernel changes, under the GNU General Public License version 2.

Features of Android

Android is a powerful operating system competing with Apple 4GS and supports great features. Few of them are listed below :-

Feature	Description
Beautiful UI	Android OS basic screen provides abeautiful and intuitive user interface.
Connectivity	GSM/EDGE, IDEN, CDMA, EV-DO, UMTS, Bluetooth, Wi-Fi, LTE, NFC and Wi-MAX.
Storage	SQ-Lite, a lightweight relational database, isused for data storage purposes.
Media support	H.263, H.264, MPEG-4 SP, AMR, AMR-WB, AAC, AAC 5.1, MP3, MID, WAV,JPEG, PNG, GIF, and BMP.
Messaging	SMS and MMS
Web browser	Based on the open-source Web-Kit layout.
Multi-touch	Android has native support for multi-touchwhich was initially made available in handsets such as the HTC Hero.
Multi-tasking	User can jump from one task to another and same time various application can runsimultaneously.
Re-sizable widgets	Widgets are re-sizeable, so users can expandthem to show more content or shrink them to save space
Multi-Language	Supports single direction and bi-directionaltext.
GCM	Google Cloud Messaging (GCM) is a service that lets developers send short message data to their users on Android devices, without needing a proprietary sync solution.
Wi-Fi Direct	A technology that lets apps discover and pair directly, over a high-bandwidth peer-to-peer connection.
Android Beam	A popular NFC-based technology that letsusers instantly share, just by touching two NFC-enabled phones together.

Android Applications

Android applications are usually developed in the Java language using the Android Software Development Kit. Once developed, Android applications can be packaged easily and sold out either through a store such as **Google Play** or the **Amazon App store**. Android powers hundreds of millions of mobile devices in more than 190 countries around the world. It's the largest installed base of any mobile platform and growing fast. Every day more than 1 Million new Android devices are activated worldwide. This tutorial has been written with an aim to teach you how to develop and package Android application. We will start from environment setup for Android application programming and then drill down to look into various aspects of Android applications.

Technology used

- **Android software development kit**

The Android software development kit (SDK) includes a comprehensive set of development tools. These include a debugger, libraries, a handset emulator based on QEMU, documentation, sample code, and tutorials. Currently supported development platforms include computers running Linux, Mac OS X 10.5.8 or later, and Windows XP or later. As of March 2015, the SDK is not available on Android itself, but the software development is possible by using specialized Android applications.

Android Studio, [9] made by Google and powered by Intelli-J, is the official IDE; however, developers are free to use others. Additionally, developers may use any text editor to edit Java and XML files, then use command line tools (Java Development Kit and Apache Ant are required) to create, build and debug Android applications as well as control attached Android devices (e.g., triggering a reboot, installing software package(s) remotely).

- **Java development kit**

The Android build process depends on a number of tools from the JDK. Check out the build system overview documentation. The first big piece we need from JDK is

Javac- all your source code written in Java needs to be compiled before it can beconverted to the DEX format.

Once your code has been compiled, dexed, and packaged into an APK, we need jar signer to sign the APK.

There are some efforts out there to bring Java 8 features to Android, most notably

gradle-retrolambda . Some of these require JDK 8 to compile properly.

Tools used for project :-

- **Android Studio**

Android Studio is the official Integrated development environment (IDE) for Android platform development.

It was announced on May 16, 2013 at the Google I/O conference. Android Studio is freely available under the Apache License 2.0 .

Android Studio was in early access preview stage starting from version 0.1 in May 2013, then entered beta stage starting from version 0.8 which was released in June 2014.

The first stable build was released in December 2014, starting from version 1.0.

Based on JetBrain's IntelliJ IDEA software, Android Studio is designed specifically for Android development. It is available for download on Windows , Mac-OS and Linux ,

and replaced Eclipse Android Development Tools (ADT) as Google's primary IDE for native Android application development.

Android Tool 1: Eclipse w/ADT

Although Eclipse is not the only Java development environment that can be used to develop Android applications, it is by far the most popular. This is partially due to its cost (free!) but mostly due the strong integration of the Android tools with Eclipse. This integration is achieved with the Android Development Tools (ADT) plug-in for Eclipse, which can be downloaded from the Android website.

Android Tool 2: The SDK and AVD Manager

This tool serves a number of important functions. It manages the different versions of the Android SDKs (build targets) that you can develop for, as well as third-party add-ons, tools, devices drivers, and documentation. Its second function is to manage the Android Virtual Device configurations (AVDs) you use to configure emulator instances.

Android Tool 3: Android Debug Bridge

The Android Debug Bridge (ADB) connects other tools with the emulator and devices. Besides being critical for the other tools (most especially the Eclipse ADT plug-in) to function, you can use it yourself from the command line to upload and download files, install and uninstall packages, and access many other features via the shell on the device or emulator.

Introduction To App

Our project is on android Application name - "RAKT".

- The Proposed "RAKT" android application helps the people who are in need of a blood by giving them all details of the availability of the donor having blood group as per need in the near by area.

- It will also provide the data or location about the near by blood banks to the user of the application.

This app will have following modules :-

1. Login User or Donor -
2. Registration of User or Donor -
3. Donor or Blood Bank search -
4. Acceptors of Blood Request -

The main aim of developing this app to provide blood to the people who are in critical need of blood , because their number increases day by day . Using this app, user can search the blood and blood banks near by him/her easily in their near by city/area . The user will get the details of the donor who are registered on the app to donate blood . In order to help people who are in need of blood .

System specification :-

To develop the app, the latest version Android studio should be installed on the machine. To install the Android studio, the computer system should have the following

System requirements :->

1. 4 GB of RAM (Minimum), 8 GB of RAM (Recommended).
2. 2 GB of available disk space (Minimum 4 GB (Recommended) [500 MB for IDE+1.5 GB for Android SDK and emulator system image].
3. 1280 x 800 minimum screen resolution.
4. Microsoft Windows 7/8/10 (32- or 64-bit). The Android Emulator supports 64-bit Windows only.
5. Latest JDK files.
6. Gradle Tool-kit.
7. Internet connection.

- Apart form this, the developer should have intermediate computer skills along with theknowledge of following courses :-

1. **Java :-** Java is the programming language that underpins all the Android Development.For those who have gained most of their programming experience in languages like JavaScript and Ruby,there can be a learning curve when pucking up Java for time.Java,like Java-script and Ruby is object-oriented but it is also stricter about the way it handles data types.Developers have to much more thoughtful with their code,defining the types of data their applications plan to work with, and more carefully allocating scare memory resources.
2. **Understanding Of XML :-** XML was created as standard way to encode data forinternet-based applications,It is a structured markup language,sharing many features in common with HTML. You may recognize the angled brackets,the<opening>and </closing> tag types, and the deep nesting of elements.In short, it allows information to be passed between devices in a way that can be understood consistently.XML to create layouts that serves as the foundational UI definition for Android applications.

3. **Android SDK :-** SDK stands for Software Development Kit,which though it may conjure up images of a briefcase full of spy tools,is actually just a fancy name for a set of pre-packaged code.The Android SDKs are models of Java code that give developers access to mobile device functions like the camera and accelerometer.One key component of Android SDK is a library called Gradle.
4. **Android Studio :-** The integrated development environment(IDE) of choice for Android developers is called Android Studio.Android Studio is build on the top of the well-respected IntelliJ IDE,and it comes with great out-of-the-box support for many of the most common Android SDKs.Android Studio also features many of the capabilities developers expect of full-features IDE. Code completion helps make auto - complete suggestions as you type.Code debuggers let you step through your code to identify the source of errors.

5. **APIS :-** As an android app developer,you'll likely want to interact with many other services.For example,you may want to allow your users to access a calendar from a third party service or check the stock market.Many companies offers APIs and will tell you exactly how to query them for data is consistent,secure way.While you're freeto interact with any existing API,Google also makes it very easy to connect to their ownAPIs from Android app.

6. **Databases :-** If the app handles large amounts of data,most of it probably won't live on your device at any given time.Instead,your app will likely interact with a database living outside of your phone.Cloud services like Fire-base or Parse provide simple APIs to store data in the cloud and make it available across devices.These platforms also often provide Java libraries that you can plug into your app,making it easy to cache some of the data on the user's device.

7. **Material design:**In contrast to competitors like Apple,Google has historically maintained a consistent design aesthetic across their products.In the recent years,that has changed.Google has released a set of forward-thinking interface guidelines and standards called Material Design,that are being rolled out across all of their products.These standards include tips for how to layer various elements on the screen and use specific styles like drop shadows.

Conclusion :-

The Android SDK ships with numerous other tools. Many of which are used for special development cases. However, the tools listed above will be used with just about every project, regardless of the type of app being developed. For more information on these and other tools available, check out the Android Tools section of the Android website. Also, new tools and improved tools are released on a fairly regular basis, so make sure you keep all of the packages updated with the AVD and SDK Manager. Finally, above and beyond the Android tools we've discussed, your best resource is the Android Developer website. Complete with up-to-date SDK downloads, source documentation, tutorials, technical articles, and the Android blog with the latest news, this website provides critical knowledge and support for Android developers.

Bibliography :-

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