PHOTO EDITING ANDROID APPLICATION

Project Report submitted
in
partial fulfillment of the requirement for the degree
of
Bachelor of Technology.inComputerScience & Engineeringunder the Supervision of

Mr.Vaibhav Diwan

By

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To

GLA University
Mathura,AJHAI - Uttar Pradesh

CERTIFICATE

This is to certify that project report entitled "PHOTO EDITING ANDROID APPLICATION", submitted by "*Rajan Sharma*" inpartial fulfillment for the award of degree of Bachelor of Technologyin Computer Science & Engineering

to GLA university been carried out under mysupervision. This work has not beensubmitted partially or fully to anyother Universityor Institute for the award of this or anyother degree or diploma.

Mr.Vaibhav Diwan
Technical Trainer

ACKNOWLEDGEMENT

It gives me immense pleasureinpresenting project reportonthe topic Photo Editing AndroidApplication.Apart from the efforts of me, the success of my project depends largely onthe encouragement and guidelines of manyothers. I take this opportunityto express mygratitude to the people whohave beeninstrumental in the successful completionofthis project.

I would like to show mygreatest appreciationto myproject in-charge, Mr.Vaibhav Diwan I can't say thank you enoughfor the tremendous support and help. I feel motivated and encouraged everytime I attend her meeting. Without her encouragement and guidance this project work would not have materialized.

Date : 17/11/2020 Rajan Sharma

CONTENTS

LIST OF SYMBOLS & ACRONYMS

GUI –GraphicalUser Interface
ADT -Android Development Tools
IDE -Integrated Development Environment
AVD–Android VirtualDevice
OEM–Original Equipment Manufacturer
DDMS -Dalvik DebugMonitor Server
ADB -Android DebugBridge
SDK–Software Development Kit

ABSTRACT

Photo editing canbe a challengingtask, and it becomes evenmore difficult on the small, portable screens ofmobile devicesthat are now frequent lyused to capture and edit images. To address this problem I present PhotoEditor, a photo editing interface for direct manipulation.

Through this application user can easily and quickly edit there pictures withthe help ofthe features provided in the application. Some ofthe features ofthe applicationare:-One tap Auto Enhance, Abilityto Crop, rotate and straightenyour photo, Adjust brightness, contrast and saturation, adding effects like blur, snowy, emboss, engrave, etc.
Allthe coding has beenbdone in JAVA language usinga plugin ofEclipse IDE i.e. Android Development Tools (ADT).

ADT is designed to provide an integrated environment in which to build Android applications. ADT extends the capabilities ofEclipse to let developers set up new Android projects, create anapplication UI, add packages based onthe Android Framework API, debug their applications usingthe Android SDK tools, and export signed (or unsigned) .apk files inorder to distribute their applications. It is a freeware available to download.

Through this software we canrunthe code either direct lyin our android device or by using AVD (Android virtual device) manager to create an AVD.

INTRODUCTION

The project named “PHOTO EDITING ANDROID APPLICATION”is developed using Eclipse IDE and Android SDK manager using JAVA language. This project has beendeveloped inpartial fulfillment of Requirements for the degree of B.TECH.(CSE) from GLAU,MATHURA .Developed for busy customers, Photo Editoris aneasy to use Android application throughwhich customers can easily edit photos using various features provided in the application.Its graphical user interface is designed in a manner to attract wide variety of people varying from age group of 18 years to 55 years. The editingmethods are optimized in sucha wayso that user can quickly and easily edit there photographs without wasting much of their time. Hence it's quick, easyand efficient.

1.2. Problem statement

To develop a Photo editing Android application with a quick and easy way to edit photos having both basic and advance level features to edit your photographs.

WORKING ENVIRONMENT

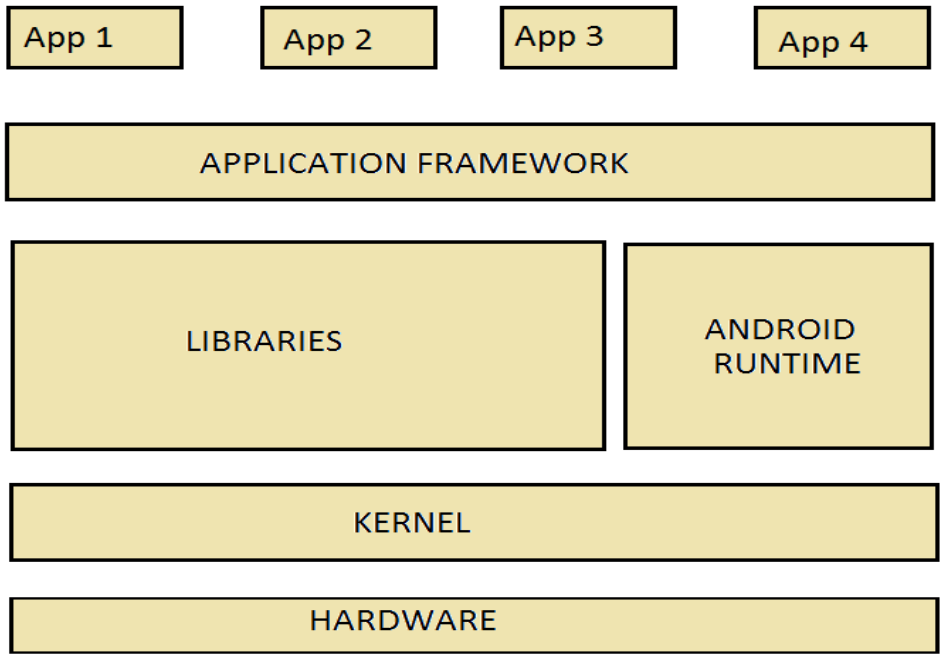
2.1. About Android

Android is an open source operating system, created by Google, and available to all kinds of developers with various expertise levels, ranging from rookie to professional.Froma developer's perspective, Android is a Linux-based operating system for smartphones and tablets. It includes a touch screen user interface, widgets, camera, network data monitoringand all the other features that enable a cell phone to be called a smartphone. Android is a platform that supports various applications, available throughthe Android PlayStore. The Android platformalso allows end users to develop, installand use their own applications on top of the Android framework. The Android framework is licensed under the Apache License, withAndroid application developers holding the right to distribute their applications under their customized license.

2.2. Understanding android

To begin development on Android evenat the application level, it is par amount to understand the basic internal architecture. Knowinghow things are arranged inside helps us understand the application

framework better, so we can design the application in a better way.Android is anOS based on Linux. Hence, deep inside, Android is pretty similar to Linux. To understand Android internals, let us look at anarchitectural diagram.



The above diagram illustrates the Android architecture. As you can see, it is a
software stack above the hardware that is provided by the OEMs. Let's start with the
topmost layer, i.e., the applications.

2.2.1 Applications

The diagram shows four basic apps (App 1, App 2, App 3 and App 4),

just to give the idea that there can be multiple apps sitting on top of Android. These apps are
like any user interface you use on Android; for example, when you use a music player, the GUI on which there are buttons to play, pause, seek, etc is an application.
Similarly, is an app for making calls, a camera app, and so on. All these apps are not necessarily from Google. Anyone can develop an app and make it available to
everyone through Google Play Store. These apps are developed in Java, and are installed directly, without the need to integrate with Android OS.

2.2.2 Application Framework

Scratching further below the applications, we reach the application framework, which application developers can leverage in developing Android applications. The framework offers a huge set of APIs used by developers for various
standard purposes, so that they don't have to code every basic task. The framework consists of certain entities; major ones are:

1. Activity Manager
 This manages the activities that govern the application life cycle and has
several states. An application may have multiple activities, which have their own life cycles. However, there is one main activity that starts when the application is launched. Generally, each activity in an application is given a window that has its own layout and user interface. An activity is stopped when another starts, and gets back to
the window that initiated it through an activity callback.

2.Notification Manager
 This manager enables the applications to create customized alerts.

3. Views
Views are used to create layouts, including components such as grids, lists, buttons, etc.

4. Resource Managers
Applications do require external resources, such as graphics, external strings, etc. All these resources are managed by the resource manager, which makes them available in a standardized way.

5. Content Provider
Applications also share data. From time to time, one application may need some data from another application. For example, an international calling application will need to access the user's address book. This access to another application's data is enabled by the content providers.

ALGORITHMS IMPLEMENTED

Some algorithm(s) have been implemented to carryout photo editing and they are mentioned below:

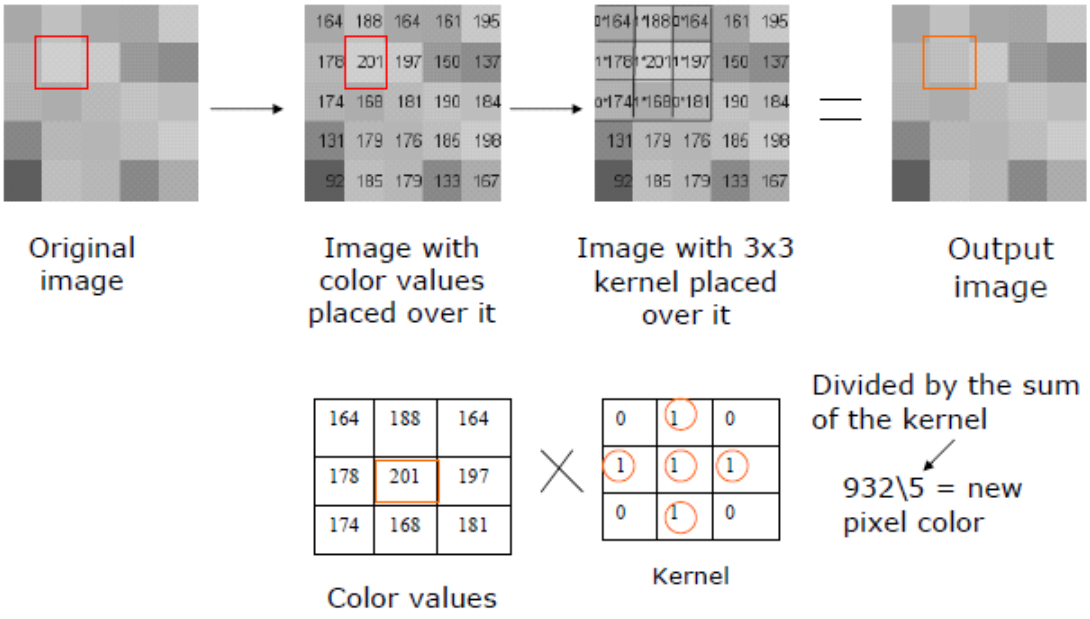
3.1 Image Convolution

Convolution filtering is used to modify the spatial frequency characteristics of an image. It is a matrix applied to an image and a mathematical operation comprised of integers. It works by determining the value of a central pixel by adding the weighted values of all its neighbors together. The output is a new modified filtered image.

Through Image Convolution various effects like Smooth, Sharpen, Intensify and Enhancement of image etc is achieved.

3.1.1 Example

For the followingimage shownbelow:



Convolution Formula:

$$V = \left| \frac{\sum_{i=1}^{} \left(\sum_{j=1}^{} f_{ij} d_{ij} \right)}{F} \right|$$

Where:
fij = the coefficient of convolution kernel at position i,j (in the kernel)
Dij = the data value of the pixel that corresponds to fij.
Q = the dimension of the kernel, assuming a square kernel (if q=3, the kernel is 3X3).
F = either the sum of coefficients of the kernel, or 1 if the sum of coefficients
is 0.

V = the output pixel value
In cases where V is less than 0, V is clipped to 0.

3.1.2 Pseudo-code

for each image row in output image:
for each pixel in image row:

set accumulator to zero

for each kernel row in kernel:
for each element in kernel row:

if element position corresponding* to pixel position then
multiply element value corresponding* to pixel value
add result to accumulator
endif

set output image pixel to accumulator.

UML DIAGRAMS

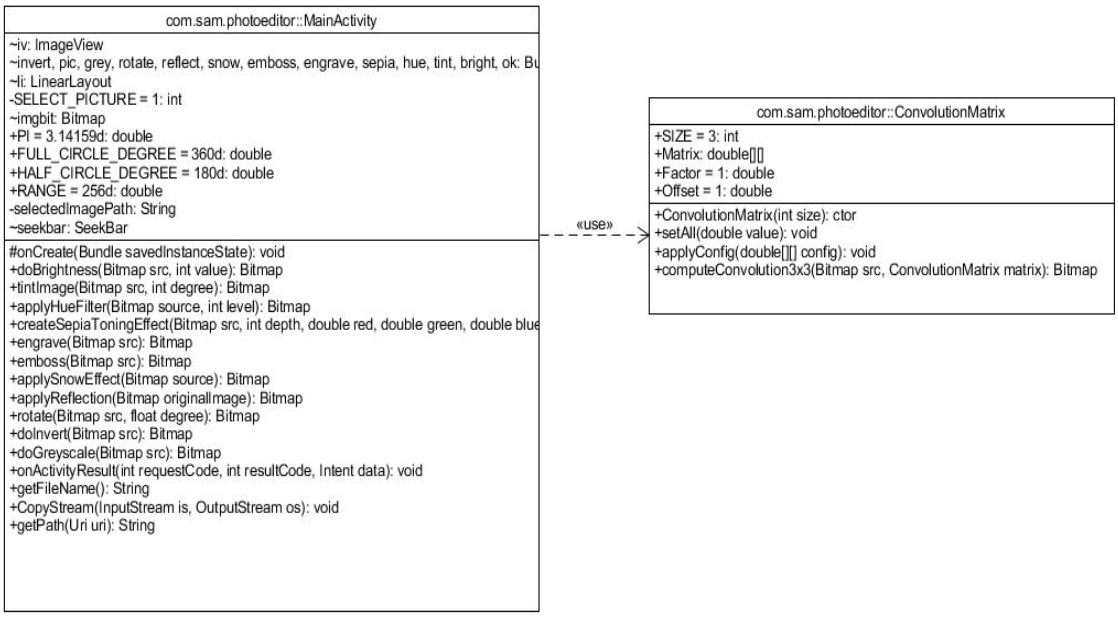
4.1 Class Diagram

A class diagramintheUnified Modeling Language(UML) is a type of static.structure diagramthat describes the structure of a system by showing the system'sclasses, their attributes, operations (or methods), and the relationships among objects.
In the diagram, classes are represented withboxes which contain three parts:

- The top part contains the nameofthe class. It is printed inbold and centered, and the first letter is capitalized.

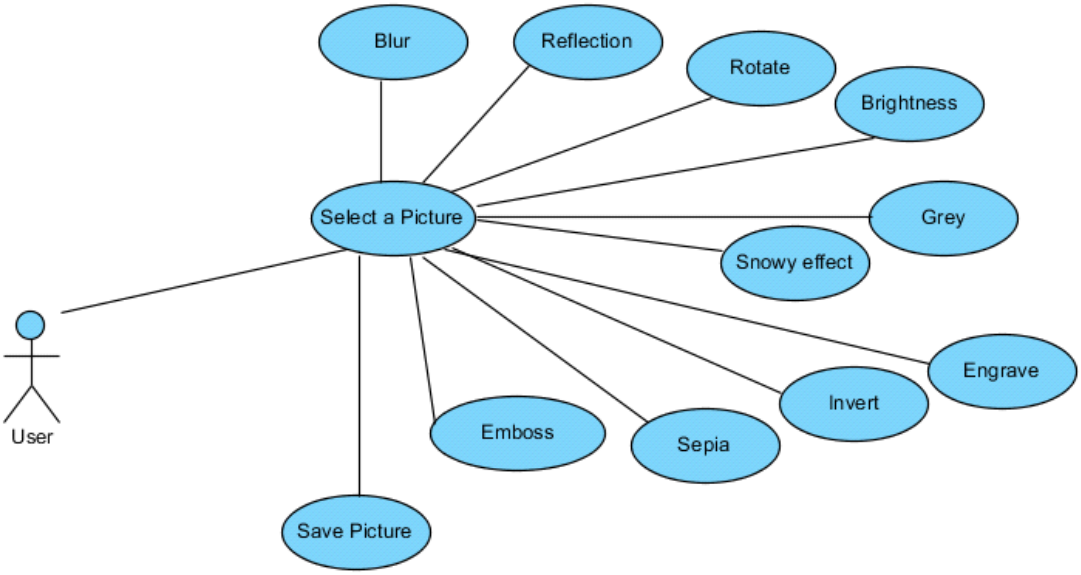
- The middle part contains the attributes ofthe class. Theyare left-aligned and the first letter is lowercase.

- The bottompart contains the methods the class canexecute. Theyare also left-aligned and the first letter is lowercase.



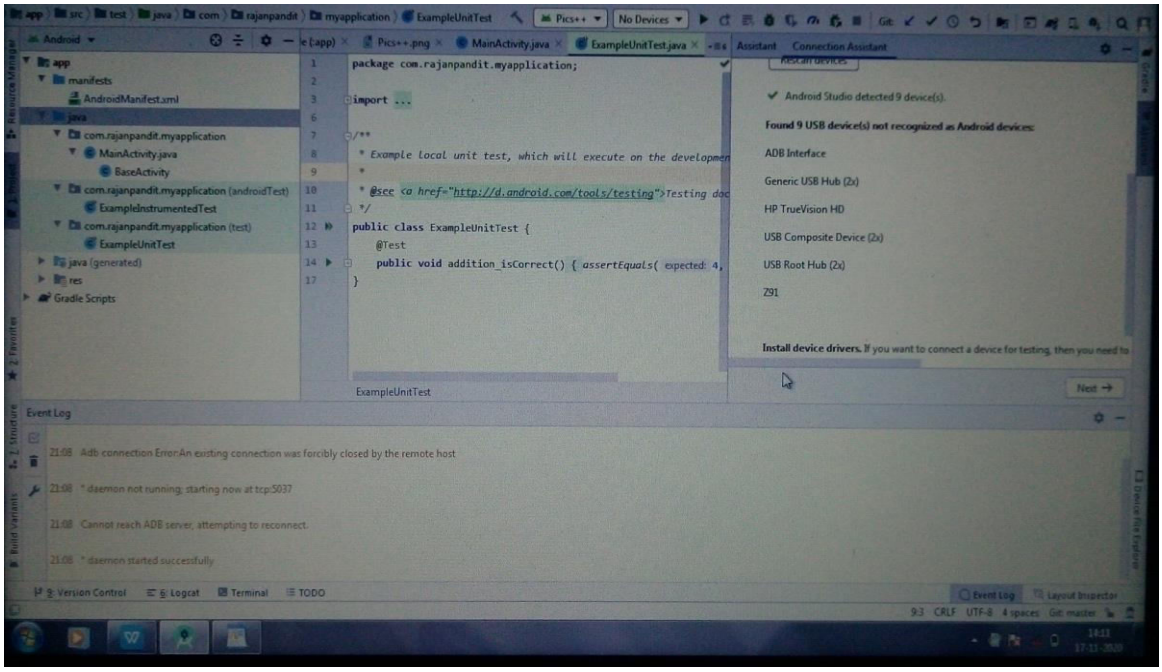
4.2 Use-Case Diagram

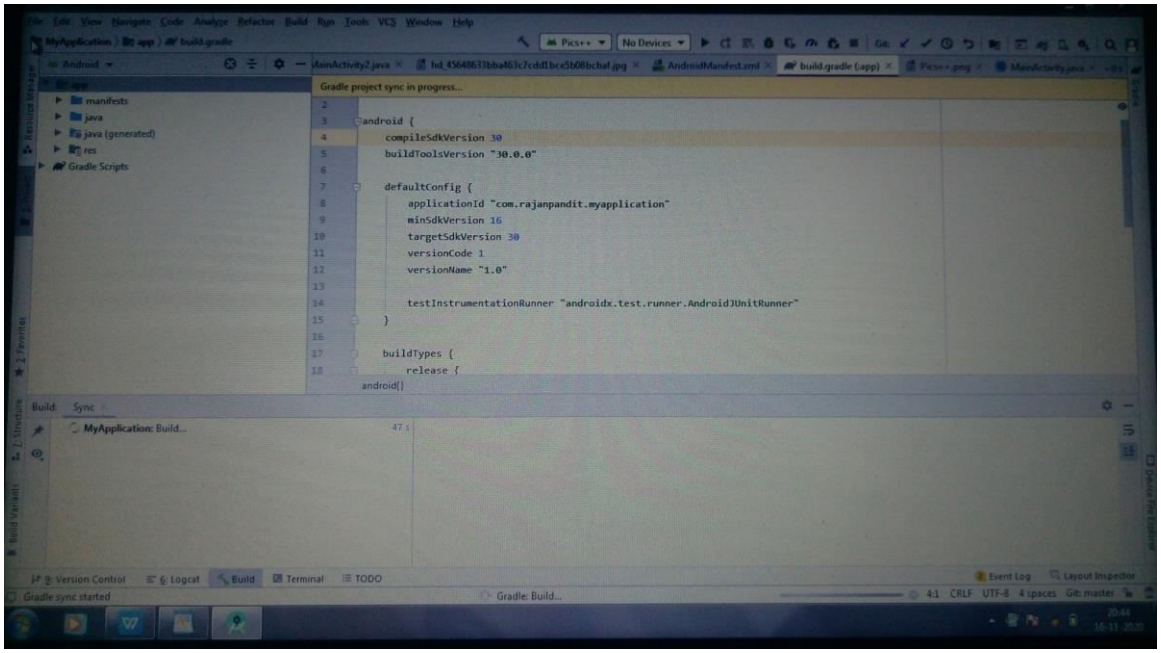
A use case diagram at its simplest is a representation of a user's interaction with the system and depicting the specifications of a use case. A use case diagram can portray
the different types of users of a system and the case and will often be accompanied by other types of diagrams as well.

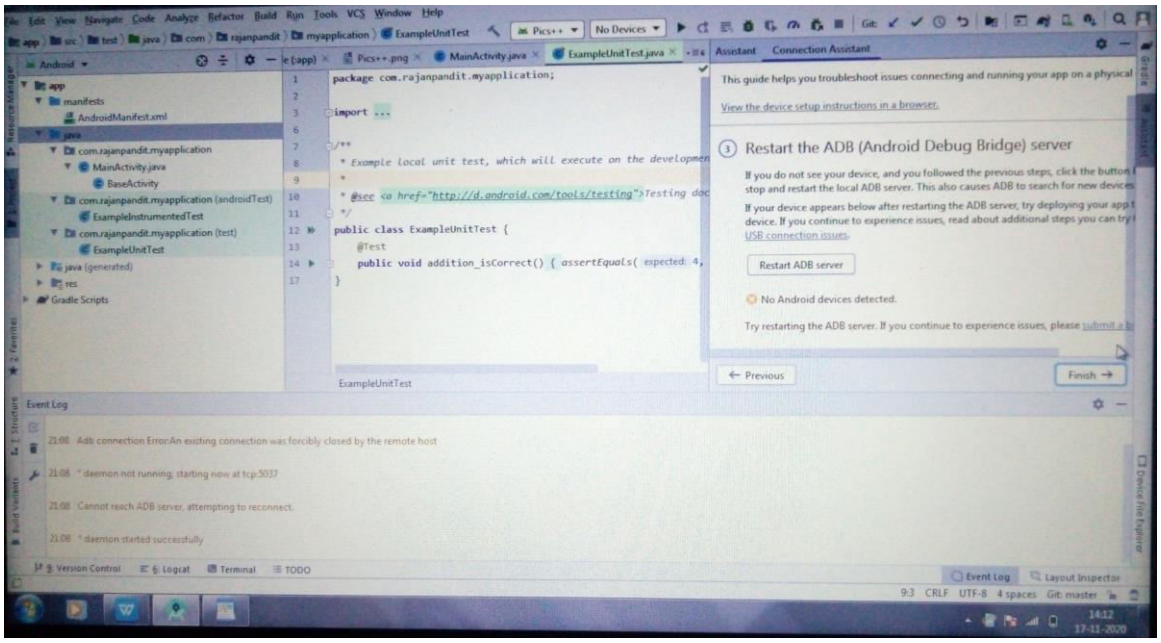


IMPLEMENTATION

5.1 Coding & Design




File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
MyApplication > app > build.gradle
Pics++
No Devices
Android
MainActivity2.java
hd_45648633bba463c7cddfbce5b08bcbaf.jpg
AndroidManifest.xml
build.gradle (:app)
Pics++.png
MainActivity.java
Gradle project sync in progress...
manifests
java
java (generated)
res
Gradle Scripts
android {
compileSdkVersion 30
buildToolsVersion "30.0.0"
defaultConfig {
applicationId "com.rajanpandit.myapplication"
minSdkVersion 16
targetSdkVersion 30
versionCode 1
versionName "1.0"
testInstrumentationRunner "androidx.test.runner.AndroidJUnitRunner"
}
buildTypes {
release {
android{}
Build:
Sync
MyApplication: Build...
47 s
9: Version Control
6: Logcat
Build
Terminal
TODO
Event Log
Layout Inspector
Gradle sync started
Gradle: Build...
4:1
CRLF
UTF-8
4 spaces
Git: master



FINDINGS & CONCLUSION

6.1 Findings

From the literature survey and the books I have read, I have understood that making an android application may look simple but it involves a lot of testing and debugging.
Also it needs to be tested on various android devices running different android versions so as to check if the application is compatible with those versions and aren't
facing any difficulties or lag. Also proper updating of the application will be must in order for the application to survive in this huge android app market
Android is a huge market and everyday tons of apps are added into the play store but only some of them survive. The key to a successful app is its impressive GUI and
smooth running without any crashes. Also it shouldn't take too much of space.

6.2 Limitations of Solution

Currently this application of mine does have some limitation. Which have been
mentioned below:

i. Integration with social Networking websites like Facebook, twitter, instagram etc is not available.

ii. Limited editing options.

iii. Adding layers and editing different layers separately is not yet available.

6.3 Future Work

The Future Work for the Application will include the following:

1. Adding more photo editing packages.
2. Integration with social networking websites like Facebook, Twitter etc
3. Layers functionality like in that of Adobe Photoshop

6.4 Conclusion

This app gives user the power to edit their picture easily and efficiently. Its an application which can be used by people of all ages who knows how to use a smartphone. The application uses minimum CPU memory and doesn’t compromise
with its performance. The editing is fast and smooth and its GUI is easy to use.

There are many features which can be added to the app and those features will be added time
to time with its regular updates.