University of Petroleum and Energy Studies

School of Computer Science

Department of Cybernetics

OPEN SOURCE MOBILE PLATFORM

(CSOS 301)

Lab File

(Session: 2019-2020)

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EXPERIMENT 1:

Title:

Installation and Configuration of Development Tool

Objective:

To install and configure Android application development tool on different operating systems.

List of Lab Activities:

- *Installation of Android Studio on Ubuntu*
  - a.i. Install jdk1.8
  - a.ii. Install android studio
    - a.ii.1. Go with standard installation
    - a.ii.2. Configure AVD

OR

- *Installation of Android Studio on Windows*
  - a.iii. Install jdk1.8
  - a.iv. Install android studio
    - a.iv.1. Go with standard installation
    - a.iv.2. Configure SDK (software Development Kit)
    - a.iv.3. Configure AVD (Android Virtual Device)

SOLUTION

EXPERIMENT 2:

Title:

Creating a single Activity with a Text Message

Objective:

To understand and become familiar with android project structure and application.

List of Lab Activities:

- Create an android application containing some text message using android studio and compile it using android sdk and execute it with created AVD.
- Check and understand project directory structure.
- Explore manifest.xml file.
- Explore main_activity.xml.
- Explore and customize Activity subclass.

SOLUTION

1. **AndroidManifest.xml**

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.osos.experiment_2">

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/AppTheme">
        <!-- Only one activity exists in the App, named
                                                MainActivity -->
        <activity android:name=".MainActivity">
            <intent-filter>
                <action
               android:name="android.intent.action.MAIN" />

                <category
             android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>
</manifest>
```

2. **MainActivity.java**

```
package com.osos.experiment_2;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
public class MainActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        //R is a layout class created automatically
```

```
        //activity_main is a layout file stored in res/layout directory
        setContentView(R.layout.activity_main);
    }
}
```

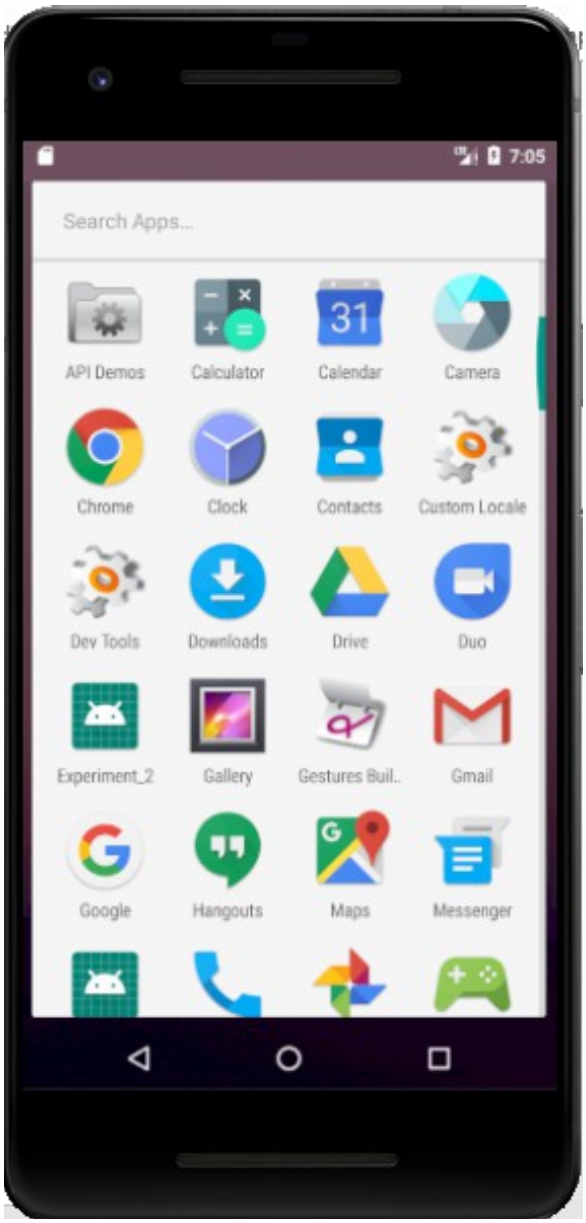
3. **activity_main.xml**

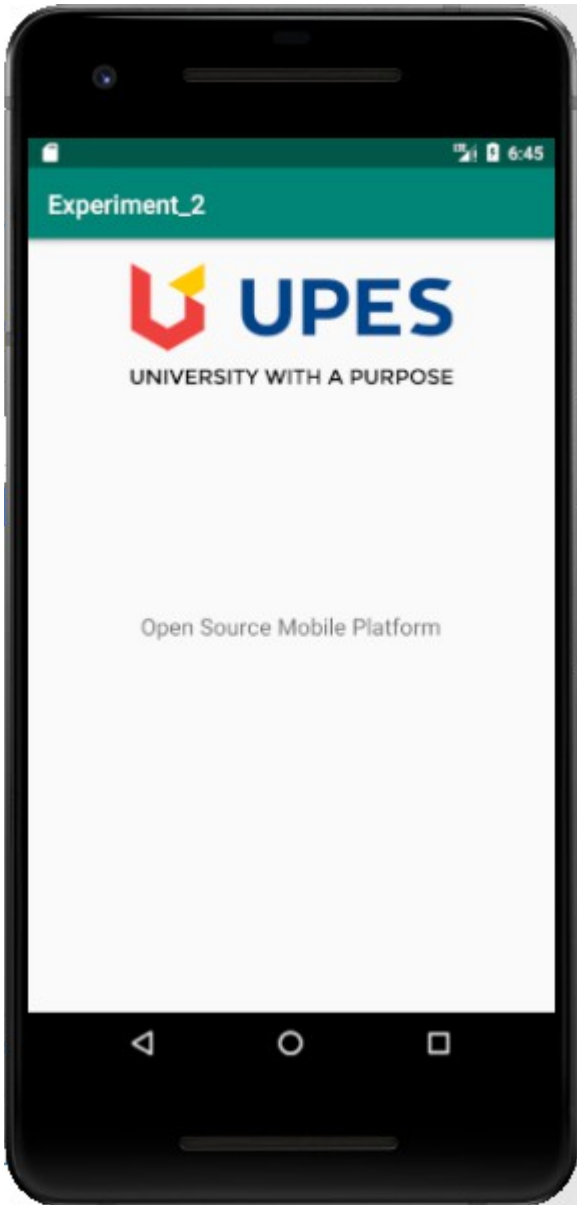
```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <!-- Embedding an Image on the top of Activity. Uses constraint
layout.Image is picked from res/drawable with id @drawable/upes-->

    <ImageView
        android:id="@+id/imageView"
        android:layout_width="380dp"
        android:layout_height="162dp"
        android:layout_marginStart="16dp"
        android:layout_marginTop="16dp"
        android:layout_marginEnd="15dp"
        android:layout_marginBottom="176dp"
        app:layout_constraintBottom_toTopOf="@+id/textView"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:srcCompat="@drawable/upes" />

    <!-- Embedding a Text view. Uses constraint layout.
     Message is picked from res/values/strins.xml with id
@string/Message-->

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/Message"
        android:textAppearance="@style/TextAppearance.AppCompat.Medium"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

4. **strings.xml**

```
<resources>
    <string name="app_name">Experiment_2</string>
    <string name="Message">Open Source Mobile Platform</string>
</resources>
```

5. **Output**


7:05
Search Apps...
API Demos
Calculator
Calendar
Camera
Chrome
Clock
Contacts
Custom Locale
Dev Tools
Downloads
Drive
Duo
Experiment_2
Gallery
Gestures Buil..
Gmail
Google
Hangouts
Maps
Messenger


6:45
Experiment_2
UPES
UNIVERSITY WITH A PURPOSE
Open Source Mobile Platform

EXPERIMENT 3:

Title:

Demonstration of Activity Life Cycle

Objective:

To create an android application and understand the life cycle in different scenario.

List of Lab Activities:

- Write a program to demonstrate different stages of the Android application activity lifecycle, by which program has to implement below functions:
  - onCreate()
  - onStart()
  - onResume()
  - onPause()
  - onStop()
  - onRestart()
  - onDestroy()
- Generate messages and print using Log.d
- Explore Logcat to view log output

List of Practice Activities:

- Tag different messages in different scenario.
- Use Android Monitor to see the performance of application.

Solution

1. **AndroidManifest.xml**
2. **MainActivity.java**
3. **activity_main.xml**
4. **OutPut:**

EXPERIMENT 4:

Title:

Use of GUI Components, Font and Colors

Objective:

- To demonstration the use of simple GUI components, Font and Colors
- To understand use of resources into application

List of Lab Activities:

- Create an android application that contains a text message and two buttons, 'CHANGE FONT' and 'CHANGE COLOR', which change font size and color of given message respectively.
- Separate data from code and use it from resources.
- Explore String.xml and use it for string values.

List of Practice Activities:

- Create an android application for native calculator
- Create an android application that takes information about a student with the help of different views and display it on same screen.
- Use student year as a spinner and use Date Picker to receive Date of Birth.

Solution

1. **AndroidManifest.xml**
2. **MainActivity.java**
3. **activity_main.xml**
4. **OutPut:**
5.

EXPERIMENT 5:

Title:

Use of different Layouts for better Interface

Objective:

To demonstrate use of different layouts like LinearLayout, RelativeLayout, FrameLayout and TableLayout

List of Lab Activities:

- Create a Linear Layout with an activity created as shown below where the controls in the page are linearly aligned.
- Create a Relative Layout with an activity created as shown below where the controls in the page are Relatively aligned.

List of Practice Activities:

- Create a Grid Layout with an activity created as shown below where the controls in the page are aligned in Grid.

- Create a Table Layout with an activity created as shown below where the controls in the page are aligned in table.

Solution

1. **AndroidManifest.xml**
2. **MainActivity.java**
3. **activity_main.xml**
4. **OutPut:**

EXPERIMENT 6:

Title:

Communication and data exchange among activities

Objective:

To understand and demonstrate the use of linking activities using Intent.

List of Lab Activities:

- Understand the usage of Intent Filter in Manifestfile.
- Write a program to create an Implicit Intent there by invoking a browser and opening “google.com” website.
- Create an android application with at least two activities. Create first activity with a textfield and a button ‘Go’. As the user clicks on button it should move to second screen and print a welcome message with user name.

List of Practice Activities:

- Create an android application for authentication process. First activity should accept the user email address and pass the email id to the second activity. In the second activity it should show the user email id and ask for the password.
- Create an android application that takes information about a student with the help of different views and display it on second screen.
- Add two buttons in an activity; 1) Call and 2) Choose contact. By Clicking on make call button, it should open the phone dialer with a predefined number. By clicking on choose contact button, it should allow the user to select a particular contact and show the details as a toast message.

Solution

1. **AndroidManifest.xml**
2. **MainActivity.java**
3. **activity_main.xml**

4. **OutPut:**
5.