ASSIGNMENT- 1

C NO- C22020221415

ROLL NO.- 3415

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BATCH- B4

**MainActivity.java file**-:

package com.example.a3415\_calculator;  
  
import android.os.Build;  
import org.mariuszgromada.math.mxparser.\*;  
import android.support.annotation.RequiresApi;  
import android.support.v7.app.AppCompatActivity;  
import android.os.Bundle;  
import android.text.SpannableStringBuilder;  
import android.view.View;  
import android.widget.EditText;  
  
public class MainActivity extends AppCompatActivity {  
  
 private EditText display;  
  
 @RequiresApi(api = Build.VERSION\_CODES.*LOLLIPOP*)  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
  
 display=findViewById(R.id.*input*);  
  
 display.setShowSoftInputOnFocus(false);  
 display.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 if(getString(R.string.*display*).equals(display.getText().toString()))  
 {  
 display.setText("");  
 }  
 }  
 });  
 }  
  
 private void updateText(String strToAdd)  
 {  
 String oldStr=display.getText().toString();  
 int cursorPos=display.getSelectionStart();  
 String leftStr=oldStr.substring(0,cursorPos);  
 String rightStr= oldStr.substring(cursorPos);  
 if(getString(R.string.*display*).equals(display.getText().toString()))  
 {  
 display.setText(strToAdd);  
 display.setSelection(cursorPos + 1);  
 }  
 else {  
 display.setText(String.*format*("%s%s%s", leftStr, strToAdd, rightStr));  
 display.setSelection(cursorPos + 1);  
 }  
 }  
  
 public void zeroBTN(View view)  
 {  
 updateText("0");  
  
 }  
  
 public void oneBTN(View view)  
 {  
 updateText("1");  
 }  
 public void twoBTN(View view)  
 {  
 updateText("2");  
 }  
  
 public void threeBTN(View view)  
 {  
 updateText("3");  
 }  
  
 public void fourBTN(View view)  
 {  
 updateText("4");  
  
 }  
  
 public void fiveBTN(View view)  
 {  
 updateText("5");  
 }  
  
 public void sixBTN(View view)  
 {  
 updateText("6");  
  
 }  
  
 public void sevenBTN(View view)  
 {  
 updateText("7");  
 }  
  
 public void eightBTN(View view)  
 {  
 updateText("8");  
  
 }  
  
 public void nineBTN(View view)  
 {  
 updateText("9");  
  
 }  
  
 public void clearBTN(View view)  
 {  
 display.setText("");  
  
 }  
  
 public void expBTN(View view)  
 {  
 updateText("^");  
  
 }  
  
 public void addBTN(View view)  
 {  
 updateText("+");  
  
 }  
  
 public void minusBTN(View view)  
 {  
 updateText("-");  
  
 }  
  
 public void divideBTN(View view)  
 {  
 updateText("/");  
  
 }  
  
 public void multiplyBTN(View view)  
 {  
 updateText("x");  
  
 }  
  
 public void parBTN(View view)  
 {  
 int cursorPos=display.getSelectionStart();  
 int openPar=0;  
 int closedPar=0;  
 int textLen=display.getText().length();  
  
 for(int i=0;i<cursorPos;i++)  
 {  
 if(display.getText().toString().substring(i,i+1).equals("("))  
 {  
 openPar += 1;  
 }  
 if(display.getText().toString().substring(i,i+1).equals(")"))  
 {  
 closedPar +=1;  
 }  
  
 }  
 if(openPar==closedPar || display.getText().toString().substring(textLen-1,textLen).equals(" "))  
 {  
 updateText("(");  
 display.setSelection(cursorPos+1);  
 }  
 else if(closedPar < openPar && !display.getText().toString().substring(textLen-1,textLen).equals(" "))  
 {  
 updateText(")");  
  
 }  
 display.setSelection(cursorPos+1);  
  
 }  
  
 public void equalBTN(View view)  
 {  
 String userExp=display.getText().toString();  
 userExp=userExp.replaceAll("x","\*");  
  
 Expression exp=new Expression(userExp);  
 String result=String.*valueOf*(exp.calculate());  
  
 display.setText(result);  
 display.setSelection(result.length());  
 }  
  
 public void pointBTN(View view)  
 {  
 updateText(".");  
  
 }  
  
 public void backspaceBTN(View view)  
 {  
 int cursorPos=display.getSelectionStart();  
 int textLen=display.getText().length();  
  
 if(cursorPos!=0 && textLen!=0)  
 {  
 SpannableStringBuilder selection= (SpannableStringBuilder) display.getText();  
 selection.replace(cursorPos-1,cursorPos,"");  
 display.setText(selection);  
 display.setSelection(cursorPos-1);  
 }  
 }  
}

**activity\_main.xml**

<?xml version="1.0" encoding="utf-8"?>  
<android.support.constraint.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:id="@+id/linearLayout"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:background="@color/white"  
 tools:context=".MainActivity">  
  
  
 <TableLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/input"  
 app:layout\_constraintVertical\_bias="0.95"  
 tools:layout\_editor\_absoluteX="1dp">  
  
 <TableRow  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent">  
  
 <Button  
 android:id="@+id/clearBTN"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="10dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:backgroundTint="@color/red"  
 android:onClick="clearBTN"  
 android:text="@string/clear"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button23"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="parBTN"  
 android:text="@string/parenthesis"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button24"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="expBTN"  
 android:text="@string/exponent"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button25"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="divideBTN"  
 android:text="@string/divide"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
  
 </TableRow>  
  
 <TableRow  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent">  
  
 <Button  
 android:id="@+id/button26"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="sevenBTN"  
 android:text="@string/seven"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button27"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="eightBTN"  
 android:text="@string/eight"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button28"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="nineBTN"  
 android:text="@string/nine"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button29"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="multiplyBTN"  
 android:text="@string/multiply"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
 </TableRow>  
  
 <TableRow  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent">  
  
 <Button  
 android:id="@+id/button30"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="fourBTN"  
 android:text="@string/four"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button31"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="fiveBTN"  
 android:text="@string/five"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button32"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="sixBTN"  
 android:text="@string/six"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button33"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="minusBTN"  
 android:text="@string/subtract"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
 </TableRow>  
  
 <TableRow  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent">  
  
 <Button  
 android:id="@+id/button34"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="oneBTN"  
 android:text="@string/one"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button35"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="twoBTN"  
 android:text="@string/two"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button36"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="threeBTN"  
 android:text="@string/three"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button37"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="addBTN"  
 android:text="@string/add"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
  
 </TableRow>  
  
 <TableRow  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent">  
  
 <ImageButton  
 android:id="@+id/button"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:contentDescription="@string/backspace"  
 android:onClick="backspaceBTN"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintHorizontal\_bias="1.0"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 app:srcCompat="@drawable/backspace" />  
  
 <Button  
 android:id="@+id/button40"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="zeroBTN"  
 android:text="@string/zero"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button39"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:onClick="pointBTN"  
 android:text="@string/point"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button38"  
 style="@style/Widget.AppCompat.Button.Borderless"  
 android:layout\_width="0dp"  
 android:layout\_height="70dp"  
 android:layout\_margin="5dp"  
 android:layout\_weight="1"  
 android:background="@drawable/circle"  
 android:backgroundTint="#43A047"  
 android:onClick="equalBTN"  
 android:text="@string/equals"  
 android:textColor="@color/white"  
 android:textSize="24sp" />  
 </TableRow>  
 </TableLayout>  
  
 <EditText  
 android:id="@+id/input"  
 android:layout\_width="0dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="30dp"  
 android:text="@string/display"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent"  
 android:autofillHints="false"  
 android:inputType="none"  
 android:textSize="36sp"  
 android:textAlignment="textEnd"  
 tools:ignore="LabelFor"  
 android:gravity="end" />  
  
  
  
  
</android.support.constraint.ConstraintLayout>

**String .xml**

<resources>  
 <string name="app\_name">3415\_calculator</string>  
 <string name="zero">0</string>  
 <string name="one">1</string>  
 <string name="two">2</string>  
 <string name="three">3</string>  
 <string name="four">4</string>  
 <string name="five">5</string>  
 <string name="six">6</string>  
 <string name="seven">7</string>  
 <string name="eight">8</string>  
 <string name="nine">9</string>  
  
 <string name="clear">C</string>  
 <string name="exponent">^</string>  
 <string name="parenthesis">( )</string>  
 <string name="multiply">x</string>  
 <string name="add">+</string>  
 <string name="subtract">-</string>  
 <string name="point">.</string>  
 <string name="equals">=</string>  
 <string name="backspace"></string>  
 <string name="display">Enter a value</string>  
 <string name="divide">/</string>  
  
</resources>

**Circle.xml**

<?xml version="1.0" encoding="utf-8"?>  
<selector xmlns:android="http://schemas.android.com/apk/res/android">  
 <item>  
 <shape android:shape="rectangle">  
 <corners android:radius="1000dp"/>  
 <solid android:color="#263238"></solid>  
 </shape>  
 </item>  
</selector>

**OUTPUT**

