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|  | **SUKKUR IBA UNIVERSITY**  MERIT – QUALITY – EXCELLENCE  Lab handout 07 | | | |  |
| Mobile Application Development (CSE-426), Fall 2022, BE-EE(CS)-VIII | | | | | |
| Name: Shakir Ali | | CMS ID#: 031-19-0009 | | Instructor: Dr. Abdul Aziz | |
| Section: A Lab group: NA | | Department: Electrical Engineering | | Marks obtained out of 100% | |
| **NOTE: Must follow submission instructions** | | |  | | |

**Design & develop calculator application**

**Lab Exercise and Submission**

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| --- |
| Exercise 1 |
| **Design & develop calculator application.** |
| Screenshot of AVD output here: |
| Insert XML code for layout here:  *<?*xml version="1.0" encoding="utf-8"*?>* <LinearLayout 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"  android:background="@color/black"  android:orientation="vertical"  tools:context=".MainActivity">   <LinearLayout  android:layout\_width="match\_parent"  android:layout\_height="0dp"  android:orientation="vertical"  android:layout\_weight="3">   <TextView  android:id="@+id/workingTextView"  android:layout\_width="wrap\_content"  android:layout\_height="0dp"  android:layout\_weight="1"  android:paddingRight="30dp"  android:gravity="center\_vertical"  android:layout\_gravity="end"  android:textAlignment="textEnd"  android:textColor="@color/white"  android:textSize="30sp" />  <TextView  android:id="@+id/resultTextView"  android:layout\_width="wrap\_content"  android:layout\_height="0dp"  android:layout\_weight="1"  android:paddingRight="30dp"  android:gravity="center\_vertical"  android:layout\_gravity="end"  android:textAlignment="textEnd"  android:textColor="@color/white"  android:textSize="45sp" />   </LinearLayout>   <LinearLayout  android:layout\_width="match\_parent"  android:layout\_height="0dp"  android:layout\_weight="1">    <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:backgroundTint="@color/red"  android:onClick="clearOnClick"  android:text="C"  android:textColor="@color/white"  android:textSize="@dimen/calcButtonTextSize" />   <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="()"  android:onClick="bracketsOnClick"  android:backgroundTint="@color/black"  android:textColor="@color/white"  android:textSize="@dimen/calcButtonTextSize" />   <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="^"  android:onClick="powerOfOnClick"  android:backgroundTint="@color/black"  android:textColor="@color/white"  android:textSize="@dimen/calcButtonTextSize" />   <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="/"  android:onClick="divisionOnClick"  android:backgroundTint="@color/black"  android:textColor="@color/white"  android:textSize="@dimen/calcButtonTextSize" />  </LinearLayout>   <LinearLayout  android:layout\_width="match\_parent"  android:layout\_height="0dp"  android:layout\_weight="1">    <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="1"  android:onClick="oneOnClick"  android:textColor="@color/white"  android:backgroundTint="@color/black"  android:textSize="@dimen/calcButtonTextSize" />    <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="2"  android:onClick="twoOnClick"  android:textColor="@color/white"  android:backgroundTint="@color/black"  android:textSize="@dimen/calcButtonTextSize" />   <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="3"  android:onClick="threeOnClick"  android:textColor="@color/white"  android:backgroundTint="@color/black"  android:textSize="@dimen/calcButtonTextSize" />   <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="\*"  android:onClick="timesOnClick"  android:textColor="@color/white"  android:backgroundTint="@color/black"  android:textSize="@dimen/calcButtonTextSize" />  </LinearLayout>   <LinearLayout  android:layout\_width="match\_parent"  android:layout\_height="0dp"  android:layout\_weight="1">   <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="4"  android:onClick="fourOnClick"  android:textColor="@color/white"  android:backgroundTint="@color/black"  android:textSize="@dimen/calcButtonTextSize" />    <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="5"  android:onClick="fiveOnClick"  android:textColor="@color/white"  android:backgroundTint="@color/black"  android:textSize="@dimen/calcButtonTextSize" />   <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="6"  android:onClick="sixOnClick"  android:textColor="@color/white"  android:backgroundTint="@color/black"  android:textSize="@dimen/calcButtonTextSize" />   <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="-"  android:onClick="minusOnClick"  android:textColor="@color/white"  android:backgroundTint="@color/black"  android:textSize="@dimen/calcButtonTextSize" />  </LinearLayout>   <LinearLayout  android:layout\_width="match\_parent"  android:layout\_height="0dp"  android:layout\_weight="1">    <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="7"  android:onClick="sevenOnClick"  android:textColor="@color/white"  android:backgroundTint="@color/black"  android:textSize="@dimen/calcButtonTextSize" />    <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="8"  android:onClick="eightOnClick"  android:textColor="@color/white"  android:backgroundTint="@color/black"  android:textSize="@dimen/calcButtonTextSize" />   <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="9"  android:onClick="nineOnClick"  android:textColor="@color/white"  android:backgroundTint="@color/black"  android:textSize="@dimen/calcButtonTextSize" />   <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="+"  android:onClick="plusOnClick"  android:backgroundTint="@color/black"  android:textColor="@color/white"  android:textSize="@dimen/calcButtonTextSize" />  </LinearLayout>  <LinearLayout  android:layout\_width="match\_parent"  android:layout\_height="0dp"  android:layout\_weight="1">    <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="."  android:onClick="decimalOnClick"  android:textColor="@color/white"  android:backgroundTint="@color/black"  android:textSize="@dimen/calcButtonTextSize" />    <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="0"  android:onClick="zeroOnClick"  android:textColor="@color/white"  android:backgroundTint="@color/black"  android:textSize="@dimen/calcButtonTextSize" />   <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="√"  android:onClick="sqrtOnClick"  android:textColor="@color/white"  android:backgroundTint="@color/black"  android:textSize="@dimen/calcButtonTextSize" />   <Button  android:layout\_width="0dp"  android:layout\_height="match\_parent"  android:layout\_weight="1"  android:text="="  android:onClick="equalsOnClick"  android:textColor="@color/white"  android:backgroundTint="@color/black"  android:textSize="@dimen/calcButtonTextSize" />  </LinearLayout> </LinearLayout> |
| Insert Activity code here:  package com.example.calculator;  import androidx.appcompat.app.AppCompatActivity;  import android.os.Bundle; import android.view.View; import android.widget.TextView;  import java.util.ArrayList;   public class MainActivity extends AppCompatActivity {  TextView workingsTV;  TextView resultsTV;   String workings = "";  String formula = "";  String tempFormula = "";   @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate(savedInstanceState);  setContentView(R.layout.*activity\_main*);  workingsTV = (TextView) findViewById(R.id.*workingTextView*);  resultsTV = (TextView) findViewById(R.id.*resultTextView*);  }    private void setWorkings(String givenValue) {  workings = workings + givenValue;  workingsTV.setText(workings);  }    public void equalsOnClick(View view) {  checkForPowerOf();   String val = workings;  String replacedstr = val.replace('÷', '/').replace('×', '\*');  double result = *eval*(replacedstr);    resultsTV.setText(String.*valueOf*(result));   }   private void checkForPowerOf() {  ArrayList<Integer> indexOfPowers = new ArrayList<>();  for (int i = 0; i < workings.length(); i++) {  if (workings.charAt(i) == '^')  indexOfPowers.add(i);  }   formula = workings;  tempFormula = workings;  for (Integer index : indexOfPowers) {  changeFormula(index);  }  formula = tempFormula;  }   private void changeFormula(Integer index) {  String numberLeft = "";  String numberRight = "";   for (int i = index + 1; i < workings.length(); i++) {  if (isNumeric(workings.charAt(i)))  numberRight = numberRight + workings.charAt(i);  else  break;  }   for (int i = index - 1; i >= 0; i--) {  if (isNumeric(workings.charAt(i)))  numberLeft = numberLeft + workings.charAt(i);  else  break;  }   String original = numberLeft + "^" + numberRight;  String changed = "Math.pow(" + numberLeft + "," + numberRight + ")";  tempFormula = tempFormula.replace(original, changed);  }   private boolean isNumeric(char c) {  if ((c <= '9' && c >= '0') || c == '.')  return true;   return false;  }    public void clearOnClick(View view) {  workingsTV.setText("");  workings = "";  resultsTV.setText("");  leftBracket = true;  }   boolean leftBracket = true;   public void bracketsOnClick(View view) {  if (leftBracket) {  setWorkings("(");  leftBracket = false;  } else {  setWorkings(")");  leftBracket = true;  }  }   public void powerOfOnClick(View view) {  setWorkings("^");  }   public void divisionOnClick(View view) {  setWorkings("/");  }   public void sevenOnClick(View view) {  setWorkings("7");  }   public void eightOnClick(View view) {  setWorkings("8");  }   public void nineOnClick(View view) {  setWorkings("9");  }   public void timesOnClick(View view) {  setWorkings("\*");  }  public void sqrtOnClick(View view) {  setWorkings("√");  }   public void fourOnClick(View view) {  setWorkings("4");  }   public void fiveOnClick(View view) {  setWorkings("5");  }   public void sixOnClick(View view) {  setWorkings("6");  }   public void minusOnClick(View view) {  setWorkings("-");  }   public void oneOnClick(View view) {  setWorkings("1");  }   public void twoOnClick(View view) {  setWorkings("2");  }   public void threeOnClick(View view) {  setWorkings("3");  }   public void plusOnClick(View view) {  setWorkings("+");  }   public void decimalOnClick(View view) {  setWorkings(".");  }   public void zeroOnClick(View view) {  setWorkings("0");  }   *//eval function* public static double eval(final String str) {  return new Object() {  int pos = -1, ch;   void nextChar() {  ch = (++pos < str.length()) ? str.charAt(pos) : -1;  }   boolean eat(int charToEat) {  while (ch == ' ') nextChar();  if (ch == charToEat) {  nextChar();  return true;  }  return false;  }   double parse() {  nextChar();  double x = parseExpression();  if (pos < str.length()) throw new RuntimeException("Unexpected: " + (char)ch);  return x;  }    double parseExpression() {  double x = parseTerm();  for (;;) {  if (eat('+')) x += parseTerm(); *// addition* else if (eat('-')) x -= parseTerm(); *// subtraction* else return x;  }  }   double parseTerm() {  double x = parseFactor();  for (;;) {  if (eat('\*')) x \*= parseFactor(); *// multiplication* else if (eat('/')) x /= parseFactor(); *// division* else return x;  }  }   double parseFactor() {  if (eat('+')) return parseFactor(); *// unary plus* if (eat('-')) return -parseFactor(); *// unary minus* double x;  int startPos = this.pos;  if (eat('(')) { *// parentheses* x = parseExpression();  eat(')');  } else if ((ch >= '0' && ch <= '9') || ch == '.') { *// numbers* while ((ch >= '0' && ch <= '9') || ch == '.') nextChar();  x = Double.*parseDouble*(str.substring(startPos, this.pos));  } else if (ch >= 'a' && ch <= 'z') { *// functions* while (ch >= 'a' && ch <= 'z') nextChar();  String func = str.substring(startPos, this.pos);  x = parseFactor();  if (func.equals("sqrt")) x = Math.*sqrt*(x);  else throw new RuntimeException("Unknown function: " + func);  } else {  throw new RuntimeException("Unexpected: " + (char)ch);  }   if (eat('^')) x = Math.*pow*(x, parseFactor()); *// exponentiation* return x;  }  }.parse();  } } |