**ANDROID LAB ASSIGNMENT**

**MCA 307**

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**Roll No : 36**

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| Create an app that illustrates the following layouts of the android studio.  ● Constraint Layout  ● Linear Layout  ● Relative Layout  ● Frame Layout  ● Table Layout |

**Question 1:**

**PROGRAM CODE:**

**activity\_main.xml**

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| <?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:id="@+id/main"      android:layout\_width="match\_parent"      android:layout\_height="match\_parent"      tools:context=".MainActivity">      <Button          android:id="@+id/l1"          android:layout\_width="143dp"          android:layout\_height="53dp"          android:layout\_marginStart="138dp"          android:layout\_marginEnd="130dp"          android:layout\_marginBottom="678dp"          android:text="LinearLayout"          app:layout\_constraintBottom\_toBottomOf="parent"          app:layout\_constraintEnd\_toEndOf="parent"          app:layout\_constraintStart\_toStartOf="parent"          app:layout\_constraintTop\_toTopOf="parent" />      <Button          android:id="@+id/l2"          android:layout\_width="175dp"          android:layout\_height="58dp"          android:layout\_marginStart="182dp"          android:layout\_marginTop="86dp"          android:layout\_marginEnd="54dp"          android:layout\_marginBottom="587dp"          android:text="Relative Layout"          app:layout\_constraintBottom\_toBottomOf="parent"          app:layout\_constraintEnd\_toEndOf="parent"          app:layout\_constraintStart\_toStartOf="parent"          app:layout\_constraintTop\_toTopOf="parent" />      <Button          android:id="@+id/l3"          android:layout\_width="142dp"          android:layout\_height="59dp"          android:layout\_marginStart="251dp"          android:layout\_marginTop="173dp"          android:layout\_marginEnd="18dp"          android:layout\_marginBottom="499dp"          android:text="Frame Layout"          app:layout\_constraintBottom\_toBottomOf="parent"          app:layout\_constraintEnd\_toEndOf="parent"          app:layout\_constraintStart\_toStartOf="parent"          app:layout\_constraintTop\_toTopOf="parent" />      <Button          android:id="@+id/l4"          android:layout\_width="136dp"          android:layout\_height="65dp"          android:layout\_marginStart="115dp"          android:layout\_marginTop="258dp"          android:layout\_marginEnd="160dp"          android:layout\_marginBottom="408dp"          android:text="Table Layout"          app:layout\_constraintBottom\_toBottomOf="parent"          app:layout\_constraintEnd\_toEndOf="parent"          app:layout\_constraintStart\_toStartOf="parent"          app:layout\_constraintTop\_toTopOf="parent" />  </androidx.constraintlayout.widget.ConstraintLayout> |

**frame\_layout\_example.xml**

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| <?xml version="1.0" encoding="utf-8"?>  <FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"      android:layout\_width="match\_parent"      android:layout\_height="match\_parent">      <TextView          android:id="@+id/textView3"          android:layout\_width="177dp"          android:layout\_height="64dp"          android:layout\_gravity="center"          android:text="Frame Layout"          android:textAlignment="center"          android:textSize="24sp" />      <Button          android:id="@+id/button4"          android:layout\_width="wrap\_content"          android:layout\_height="wrap\_content"          android:layout\_gravity="bottom|center\_horizontal"          android:layout\_marginBottom="20dp"          android:text="b1" />      <Button          android:id="@+id/back\_button"          android:layout\_width="wrap\_content"          android:layout\_height="wrap\_content"          android:layout\_gravity="bottom|center\_horizontal"          android:text="Back to Main"          android:layout\_marginBottom="100dp" />  </FrameLayout> |

**linear\_layout\_example.xml**

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| <?xml version="1.0" encoding="utf-8"?>  <LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"      android:orientation="vertical"      android:layout\_width="match\_parent"      android:layout\_height="match\_parent">      <TextView          android:id="@+id/textView"          android:layout\_width="match\_parent"          android:layout\_height="wrap\_content"          android:text="Hello ,Linear Layout"          android:textAlignment="center"          android:textSize="24sp" />      <Button          android:id="@+id/button2"          android:layout\_width="match\_parent"          android:layout\_height="74dp"          android:text="Button1" />      <Button          android:id="@+id/button3"          android:layout\_width="match\_parent"          android:layout\_height="83dp"          android:text="Button2" />      <Button          android:id="@+id/back\_button"          android:layout\_width="match\_parent"          android:layout\_height="wrap\_content"          android:text="Back to Main" />  </LinearLayout> |

**relative\_layout\_example.xml**

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| <?xml version="1.0" encoding="utf-8"?>  <RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"      android:layout\_width="match\_parent"      android:layout\_height="match\_parent">      <TextView          android:id="@+id/textView2"          android:layout\_width="wrap\_content"          android:layout\_height="wrap\_content"          android:text="Relative Layout"          android:textAlignment="textStart"          android:textSize="24sp" />      <Button          android:id="@+id/button6"          android:layout\_width="wrap\_content"          android:layout\_height="wrap\_content"          android:layout\_marginLeft="50dp"          android:layout\_marginTop="100dp"          android:text="Button1" />      <Button          android:id="@+id/button7"          android:layout\_width="wrap\_content"          android:layout\_height="wrap\_content"          android:layout\_marginLeft="300dp"          android:layout\_marginTop="50dp"          android:text="b2" />      <Button          android:id="@+id/back\_button"          android:layout\_width="wrap\_content"          android:layout\_height="wrap\_content"          android:layout\_alignParentBottom="true"          android:layout\_centerHorizontal="true"          android:text="Back to Main" />  </RelativeLayout> |

**table\_layout\_example.xml**

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| <?xml version="1.0" encoding="utf-8"?>  <TableLayout xmlns:android="http://schemas.android.com/apk/res/android"      android:layout\_width="match\_parent"      android:layout\_height="match\_parent">      <TableRow          android:layout\_width="match\_parent"          android:layout\_height="match\_parent">          <TextView              android:id="@+id/textView4"              android:layout\_width="wrap\_content"              android:layout\_height="wrap\_content"              android:layout\_marginLeft="10dp"              android:layout\_marginTop="20dp"              android:text="Row1,Col1"              android:textSize="24sp" />          <TextView              android:id="@+id/textView5"              android:layout\_width="wrap\_content"              android:layout\_height="wrap\_content"              android:layout\_marginLeft="10dp"              android:layout\_marginTop="20dp"              android:text="Row1,Col2"              android:textSize="24sp" />      </TableRow>      <TableRow          android:layout\_width="match\_parent"          android:layout\_height="match\_parent" >          <TextView              android:id="@+id/textView6"              android:layout\_width="wrap\_content"              android:layout\_height="wrap\_content"              android:layout\_marginLeft="10dp"              android:layout\_marginTop="20dp"              android:text="Row2,col1"              android:textSize="24sp" />          <TextView              android:id="@+id/textView7"              android:layout\_width="wrap\_content"              android:layout\_height="wrap\_content"              android:layout\_marginLeft="10dp"              android:layout\_marginTop="20dp"              android:text="Row2,Col2"              android:textSize="24sp" />      </TableRow>      <TableRow          android:layout\_width="match\_parent"          android:layout\_height="match\_parent">          <Button              android:id="@+id/back\_button"              android:layout\_width="match\_parent"              android:layout\_height="wrap\_content"              android:text="Back to Main" />      </TableRow>  </TableLayout> |

**MainActivity.java**

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| package com.example.layouts;  import android.os.Bundle;  import androidx.activity.EdgeToEdge;  import androidx.appcompat.app.AppCompatActivity;  import androidx.core.graphics.Insets;  import androidx.core.view.ViewCompat;  import androidx.core.view.WindowInsetsCompat;  public class MainActivity extends AppCompatActivity {      @Override      protected void onCreate(Bundle savedInstanceState) {          super.onCreate(savedInstanceState);          EdgeToEdge.enable(this);          setContentView(R.layout.activity\_main);          setMainView();          ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> {              Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());              v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);              return insets;          });      }      private void setMainView() {          setContentView(R.layout.activity\_main);          findViewById(R.id.l1).setOnClickListener(v -> {              setContentView(R.layout.linear\_layout\_example);              findViewById(R.id.back\_button).setOnClickListener(view -> setMainView());          });          findViewById(R.id.l2).setOnClickListener(v -> {              setContentView(R.layout.relative\_layout\_example);              findViewById(R.id.back\_button).setOnClickListener(view -> setMainView());          });          findViewById(R.id.l3).setOnClickListener(v -> {              setContentView(R.layout.frame\_layout\_example);              findViewById(R.id.back\_button).setOnClickListener(view -> setMainView());          });          findViewById(R.id.l4).setOnClickListener(v -> {              setContentView(R.layout.table\_layout\_example);              findViewById(R.id.back\_button).setOnClickListener(view -> setMainView());          });      }  } |

**OUTPUT :**

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| Create an app that demonstrates Tab Layout and Grid View. |

**Question 2:**

**PROGRAM CODE:**

**activity\_main.xml**

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| <?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:id="@+id/main"      android:layout\_width="match\_parent"      android:layout\_height="match\_parent"      android:orientation="vertical"      tools:context=".MainActivity">      <com.google.android.material.tabs.TabLayout          android:id="@+id/tablayout1"          android:layout\_width="match\_parent"          android:layout\_height="wrap\_content"          android:layout\_marginBottom="683dp">          <com.google.android.material.tabs.TabItem              android:layout\_width="wrap\_content"              android:layout\_height="wrap\_content"              android:text="Monday" />          <com.google.android.material.tabs.TabItem              android:layout\_width="wrap\_content"              android:layout\_height="wrap\_content"              android:text="Tuesday" />          <com.google.android.material.tabs.TabItem              android:layout\_width="wrap\_content"              android:layout\_height="wrap\_content"              android:text="Wednesday" />      </com.google.android.material.tabs.TabLayout>      <androidx.viewpager2.widget.ViewPager2          android:id="@+id/pager1"          android:layout\_width="match\_parent"          android:layout\_height="match\_parent" />  </LinearLayout> |

**Fragment\_grid.xml**

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| <?xml version="1.0" encoding="utf-8"?>  <LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"      android:orientation="vertical"      android:layout\_width="match\_parent"      android:layout\_height="match\_parent">      <GridView          android:id="@+id/grid1"          android:layout\_width="match\_parent"          android:layout\_height="match\_parent"          android:horizontalSpacing="10dp"          android:numColumns="2"          android:verticalSpacing="10dp" />  </LinearLayout> |

**MainActivity.java**

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| --- |
| package com.example.tabgridview;  import android.os.Bundle;  import androidx.activity.EdgeToEdge;  import androidx.appcompat.app.AppCompatActivity;  import androidx.core.graphics.Insets;  import androidx.core.view.ViewCompat;  import androidx.core.view.WindowInsetsCompat;  import androidx.annotation.NonNull;  import androidx.viewpager2.widget.ViewPager2;  import com.google.android.material.tabs.TabLayout;  import com.google.android.material.tabs.TabLayoutMediator;  public class MainActivity extends AppCompatActivity {      @Override      protected void onCreate(Bundle savedInstanceState) {          super.onCreate(savedInstanceState);          EdgeToEdge.enable(this);          setContentView(R.layout.activity\_main);          TabLayout tabLayout = findViewById(R.id.tablayout1);          ViewPager2 viewPager = findViewById(R.id.pager1);          ViewPagerAdapter adapter = new ViewPagerAdapter(this);          viewPager.setAdapter(adapter);          new TabLayoutMediator(tabLayout, viewPager, new TabLayoutMediator.TabConfigurationStrategy() {              @Override              public void onConfigureTab(@NonNull TabLayout.Tab tab, int position) {                  tab.setText("Tab " + (position + 1));              }          }).attach();          ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> {              Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());              v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);              return insets;          });      }  } |

**GridFragment.java**

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| package com.example.tabgridview;  //import these:-  import android.os.Bundle;  import android.view.LayoutInflater;  import android.view.View;  import android.view.ViewGroup;  import android.widget.ArrayAdapter;  import android.widget.GridView;  import androidx.annotation.NonNull;  import androidx.annotation.Nullable;  import androidx.fragment.app.Fragment;  public class GridFragment extends Fragment{      @Nullable      @Override      public View onCreateView(@NonNull LayoutInflater inflater, @Nullable ViewGroup container, @Nullable Bundle savedInstanceState) {          View view = inflater.inflate(R.layout.fragment\_grid, container, false);          GridView gridView = view.findViewById(R.id.grid1);          String[] items = {"Item 1", "Item 2", "Item 3", "Item 4", "Item 5", "Item 6"};          ArrayAdapter<String> adapter = new ArrayAdapter<>(getContext(), android.R.layout.simple\_list\_item\_1, items);          gridView.setAdapter(adapter);          return view;      }  } |

**ViewPagerAdapter.java**

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| package com.example.tabgridview;  import androidx.annotation.NonNull;  import androidx.fragment.app.Fragment;  import androidx.fragment.app.FragmentActivity;  import androidx.viewpager2.adapter.FragmentStateAdapter;  public class ViewPagerAdapter extends FragmentStateAdapter{      public ViewPagerAdapter(@NonNull FragmentActivity fragmentActivity) {          super(fragmentActivity);      }      @NonNull      @Override      public Fragment createFragment(int position) {          // You can create multiple fragments for different tabs          return new GridFragment();      }      @Override      public int getItemCount() {          // Number of tabs          return 3;      }  } |

**OUTPUT :**

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**Question 3:**

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| Develop a calculator app using appropriate layouts. |

**PROGRAM CODE:**

**activity\_main.xml**

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| <?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:id="@+id/main"      android:layout\_width="match\_parent"      android:layout\_height="match\_parent"      android:gravity="end"      android:orientation="vertical"      tools:context=".MainActivity">      <TextView          android:id="@+id/display"          android:layout\_width="match\_parent"          android:layout\_height="wrap\_content"          android:background="#000000"          android:gravity="end"          android:padding="24dp"          android:text="0"          android:textColor="#FFFFFF"          android:textSize="32sp"          android:textStyle="bold" />      <androidx.gridlayout.widget.GridLayout          android:id="@+id/gridlayout"          android:layout\_width="match\_parent"          android:layout\_height="0dp"          android:layout\_weight="1"          android:padding="16dp"          app:alignmentMode="alignMargins"          app:columnCount="4"          app:rowCount="5">          <Button              android:id="@+id/buttonC"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="C"              android:textSize="24sp"              app:layout\_column="0"              app:layout\_columnWeight="1"              app:layout\_row="0"              app:layout\_rowWeight="1" />          <Button              android:id="@+id/buttonBackspace"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="⌫"              android:textSize="24sp"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />          <Button              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text=" "              app:layout\_columnWeight="1"              app:layout\_rowWeight="1"              tools:ignore="SpeakableTextPresentCheck" />          <Button              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text=" "              app:layout\_columnWeight="1"              app:layout\_rowWeight="1"              tools:ignore="SpeakableTextPresentCheck" />          <Button              android:id="@+id/button"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="7"              android:textColor="#FFFFFF"              android:textSize="24sp"              android:textStyle="bold"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />          <Button              android:id="@+id/button2"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="8"              android:textColor="#FFFFFF"              android:textSize="24sp"              android:textStyle="bold"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />          <Button              android:id="@+id/button3"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="9"              android:textColor="#FFFFFF"              android:textSize="24sp"              android:textStyle="bold"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />          <Button              android:id="@+id/button4"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="/"              android:textColor="#FFFFFF"              android:textSize="24sp"              android:textStyle="bold"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />          <Button              android:id="@+id/button5"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="4"              android:textColor="#FFFFFF"              android:textSize="24sp"              android:textStyle="bold"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />          <Button              android:id="@+id/button6"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="5"              android:textColor="#FFFFFF"              android:textSize="24sp"              android:textStyle="bold"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />          <Button              android:id="@+id/button7"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="6"              android:textColor="#FFFFFF"              android:textSize="24sp"              android:textStyle="bold"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />          <Button              android:id="@+id/button8"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="\*"              android:textColor="#FFFFFF"              android:textSize="24sp"              android:textStyle="bold"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />          <Button              android:id="@+id/button9"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="1"              android:textColor="#FFFFFF"              android:textSize="24sp"              android:textStyle="bold"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />          <Button              android:id="@+id/button10"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="2"              android:textColor="#FFFFFF"              android:textSize="24sp"              android:textStyle="bold"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />          <Button              android:id="@+id/button11"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="3"              android:textColor="#FFFFFF"              android:textSize="24sp"              android:textStyle="bold"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />          <Button              android:id="@+id/button12"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="-"              android:textColor="#FFFFFF"              android:textSize="24sp"              android:textStyle="bold"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />          <Button              android:id="@+id/button13"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="0"              android:textColor="#FFFFFF"              android:textSize="24sp"              android:textStyle="bold"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />          <Button              android:id="@+id/button14"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="."              android:textColor="#FFFFFF"              android:textSize="24sp"              android:textStyle="bold"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />          <Button              android:id="@+id/button15"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="="              android:textColor="#FFFFFF"              android:textSize="24sp"              android:textStyle="bold"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />          <Button              android:id="@+id/button16"              android:layout\_width="0dp"              android:layout\_height="0dp"              android:text="+"              android:textColor="#FFFFFF"              android:textSize="24sp"              android:textStyle="bold"              app:layout\_columnWeight="1"              app:layout\_rowWeight="1" />      </androidx.gridlayout.widget.GridLayout>  </LinearLayout> |

**MainActivity.java**

|  |
| --- |
| package com.example.calculatorapp;  import android.os.Bundle;  import androidx.activity.EdgeToEdge;  import androidx.appcompat.app.AppCompatActivity;  import androidx.core.graphics.Insets;  import androidx.core.view.ViewCompat;  import androidx.core.view.WindowInsetsCompat;  //  import android.view.View;  import android.widget.Button;  import android.widget.TextView;  public class MainActivity extends AppCompatActivity {      private TextView display;      private StringBuilder currentInput = new StringBuilder();      private double firstNumber = 0;      private String operator = "";      @Override      protected void onCreate(Bundle savedInstanceState) {          super.onCreate(savedInstanceState);          EdgeToEdge.enable(this);          setContentView(R.layout.activity\_main);          //          display = findViewById(R.id.display);          View.OnClickListener listener = new View.OnClickListener() {              @Override              public void onClick(View view) {                  Button button = (Button) view;                  String buttonText = button.getText().toString();                  handleInput(buttonText);              }          };          //array:          int[] buttonIds = {                  R.id.button, R.id.button2, R.id.button3, R.id.button4,                  R.id.button5, R.id.button6, R.id.button7, R.id.button8,                  R.id.button9, R.id.button10, R.id.button11, R.id.button12,                  R.id.button13, R.id.button14, R.id.button15, R.id.button16 ,                  R.id.buttonC, R.id.buttonBackspace          };          for (int id : buttonIds) {              findViewById(id).setOnClickListener(listener);          }          ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> {              Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());              v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);              return insets;          });      }      private void handleInput(String input) {          if ("0123456789.".contains(input)) {              currentInput.append(input);              display.setText(currentInput.toString());          } else if ("+-\*/".contains(input)) {              if (currentInput.length() > 0) {                  firstNumber = Double.parseDouble(currentInput.toString());                  operator = input;                  currentInput.setLength(0);              }          } else if ("=".equals(input)) {              if (currentInput.length() > 0 && !operator.isEmpty()) {                  double secondNumber = Double.parseDouble(currentInput.toString());                  double result = 0;                  switch (operator) {                      case "+":                          result = firstNumber + secondNumber;                          break;                      case "-":                          result = firstNumber - secondNumber;                          break;                      case "\*":                          result = firstNumber \* secondNumber;                          break;                      case "/":                          if (secondNumber != 0) {                              result = firstNumber / secondNumber;                          } else {                              display.setText("Error");                              return;                          }                          break;                  }                  display.setText(String.valueOf(result));                  currentInput.setLength(0);                  currentInput.append(result);                  operator = "";              }          }          else if ("C".equals(input)) {              currentInput.setLength(0);              display.setText("0");              operator = "";              firstNumber = 0;          } else if ("⌫".equals(input)) {              if (currentInput.length() > 0) {                  currentInput.deleteCharAt(currentInput.length() - 1);                  display.setText(currentInput.toString());              }              if (currentInput.length() == 0) {                  display.setText("0");              }          }      }  } |

**OUTPUT :**

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**Question 4:**

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| --- |
| Create an android application that displays a contact list using List View. |

**PROGRAM CODE:**

**activity\_main.xml**

|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?>  <RelativeLayout 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/main"      android:layout\_width="match\_parent"      android:layout\_height="match\_parent"      tools:context=".MainActivity" >      <ListView          android:id="@+id/contact\_list\_view"          android:layout\_width="match\_parent"          android:layout\_height="match\_parent" />  </RelativeLayout> |

**contact\_item.xml**

|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?>  <LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"      android:layout\_width="match\_parent"      android:layout\_height="match\_parent"      android:orientation="vertical"      android:padding="16dp">      <TextView          android:id="@+id/contact\_name"          android:layout\_width="match\_parent"          android:layout\_height="wrap\_content"          android:text="TextView"          android:textColor="#000"          android:textSize="24sp"          android:textStyle="bold" />      <TextView          android:id="@+id/contact\_number"          android:layout\_width="match\_parent"          android:layout\_height="wrap\_content"          android:text="TextView"          android:textColor="#777"          android:textSize="16sp"          android:textStyle="bold" />  </LinearLayout> |

**MainActivity.java**

|  |
| --- |
| package com.example.contactlistapp;  import android.os.Bundle;  import androidx.activity.EdgeToEdge;  import androidx.appcompat.app.AppCompatActivity;  import androidx.core.graphics.Insets;  import androidx.core.view.ViewCompat;  import androidx.core.view.WindowInsetsCompat;  //  import android.widget.ListView;  import java.util.ArrayList;  import java.util.List;  public class MainActivity extends AppCompatActivity {      private ListView contactListView;      private ContactAdapter contactAdapter;      private List<Contact> contactList;      @Override      protected void onCreate(Bundle savedInstanceState) {          super.onCreate(savedInstanceState);          EdgeToEdge.enable(this);          setContentView(R.layout.activity\_main);          //          contactListView = findViewById(R.id.contact\_list\_view);          contactList = new ArrayList<>();          contactList.add(new Contact("Muhammad Anshad P A", "8157847663"));          contactList.add(new Contact("Dilsha C P", "9995592263"));          contactList.add(new Contact("Alice Brown", "555-123-4567"));          contactList.add(new Contact("Bob Johnson", "777-888-9999"));          contactAdapter = new ContactAdapter(this, contactList);          contactListView.setAdapter(contactAdapter);          ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> {              Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());              v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);              return insets;          });      }  } |

**ContactAdapter.java**

|  |
| --- |
| package com.example.contactlistapp;  import android.content.Context;  import android.view.LayoutInflater;  import android.view.View;  import android.view.ViewGroup;  import android.widget.BaseAdapter;  import android.widget.TextView;  import java.util.List;  public class ContactAdapter extends BaseAdapter {      private Context context;      private List<Contact> contactList;      public ContactAdapter(Context context, List<Contact> contactList) {          this.context = context;          this.contactList = contactList;      }      @Override      public int getCount() {          return contactList.size();      }      @Override      public Object getItem(int position) {          return contactList.get(position);      }      @Override      public long getItemId(int position) {          return position;      }      @Override      public View getView(int position, View convertView, ViewGroup parent) {          if (convertView == null) {              convertView = LayoutInflater.from(context).inflate(R.layout.contact\_item, parent, false);          }          Contact contact = contactList.get(position);          TextView nameTextView = convertView.findViewById(R.id.contact\_name);          TextView phoneTextView = convertView.findViewById(R.id.contact\_number);          nameTextView.setText(contact.getName());          phoneTextView.setText(contact.getPhoneNumber());          return convertView;      }  } |

**Contact.java**

|  |
| --- |
| package com.example.contactlistapp;  public class Contact {      private String name;      private String phoneNumber;      public Contact(String name, String phoneNumber) {          this.name = name;          this.phoneNumber = phoneNumber;      }      public String getName() {          return name;      }      public String getPhoneNumber() {          return phoneNumber;      }  } |

**OUTPUT :**

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**Question 5:**

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| Design the user interface of an online food delivery app using Custom List View  that displays different items available for the day along with its details. |

**PROGRAM CODE:**

**activity\_main.xml**

|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?>  <LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"      xmlns:tools="http://schemas.android.com/tools"      android:layout\_width="match\_parent"      android:layout\_height="match\_parent"      android:orientation="vertical"      tools:context=".MainActivity">      <ListView          android:id="@+id/food\_list\_view"          android:layout\_width="match\_parent"          android:layout\_height="match\_parent"/>  </LinearLayout> |

**List\_item\_food.xml**

|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?>  <LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"      android:layout\_width="match\_parent"      android:layout\_height="wrap\_content"      android:orientation="horizontal"      android:padding="16dp">      <ImageView          android:id="@+id/food\_image"          android:layout\_width="80dp"          android:layout\_height="80dp"          android:layout\_marginRight="16dp"          android:scaleType="centerCrop" />      <LinearLayout          android:layout\_width="0dp"          android:layout\_height="wrap\_content"          android:layout\_weight="1"          android:orientation="vertical">          <TextView              android:id="@+id/food\_name"              android:layout\_width="match\_parent"              android:layout\_height="wrap\_content"              android:textSize="18sp"              android:textStyle="bold" />          <TextView              android:id="@+id/food\_description"              android:layout\_width="match\_parent"              android:layout\_height="wrap\_content"              android:textSize="14sp" />          <TextView              android:id="@+id/food\_price"              android:layout\_width="match\_parent"              android:layout\_height="wrap\_content"              android:textSize="16sp"              android:textStyle="italic"              android:textColor="@android:color/holo\_red\_dark" />      </LinearLayout>  </LinearLayout> |

**MainActivity.java**

|  |
| --- |
| package com.example.fooddelivery;  import android.os.Bundle;  import android.widget.ListView;  import androidx.appcompat.app.AppCompatActivity;  import java.util.ArrayList;  import java.util.List;  public class MainActivity extends AppCompatActivity {      private ListView foodListView;      private FoodItemAdapter foodItemAdapter;      private List<FoodItem> foodItemList;      @Override      protected void onCreate(Bundle savedInstanceState) {          super.onCreate(savedInstanceState);          setContentView(R.layout.activity\_main);          foodListView = findViewById(R.id.food\_list\_view);          foodItemList = new ArrayList<>();          foodItemList.add(new FoodItem("Mojito", " Refreshment", 90, R.drawable.mojito));          foodItemList.add(new FoodItem("Biriyani", " Dhum biriyani", 160, R.drawable.biriyani));          foodItemList.add(new FoodItem("Burger", " Jumbo burger", 220, R.drawable.burger));          foodItemList.add(new FoodItem("Dosa", " Masala Dosa ", 80, R.drawable.dosa));          foodItemList.add(new FoodItem("Loaded Fries", " Fries with loaded chicken topings", 180, R.drawable.loaded\_fries));          foodItemList.add(new FoodItem("Mandi", " Alfaham Mandi", 220, R.drawable.mandi));          foodItemList.add(new FoodItem("Momos", " Fried Momos", 120, R.drawable.momos));          foodItemList.add(new FoodItem("Payasam", " Adapradhaman", 160, R.drawable.payasam));          foodItemList.add(new FoodItem("Pizza", " Chicken Suasage pizaa", 199, R.drawable.pizza));          foodItemList.add(new FoodItem("Porotta Beef", " Porotta with Beef", 120, R.drawable.porotta));          foodItemList.add(new FoodItem("Russian", " Honey Cake", 180, R.drawable.russian\_honey\_cake));          foodItemList.add(new FoodItem("Sandwich", " Special Sanddwich", 180, R.drawable.sandwich));          foodItemList.add(new FoodItem("Shawarma", " jumbo shawarma", 220, R.drawable.shawarma));          foodItemAdapter = new FoodItemAdapter(this, foodItemList);          foodListView.setAdapter(foodItemAdapter);      }  } |

**FoodItem.java**

|  |
| --- |
| package com.example.fooddelivery;  public class FoodItem {      private String name;      private String description;      private double price;      private int imageResourceId;      public FoodItem(String name, String description, double price, int imageResourceId) {          this.name = name;          this.description = description;          this.price = price;          this.imageResourceId = imageResourceId;      }      public String getName() {          return name;      }      public String getDescription() {          return description;      }      public double getPrice() {          return price;      }      public int getImageResourceId() {          return imageResourceId;      }  } |

**FoodItemAdapter.java**

|  |
| --- |
| package com.example.fooddelivery;  import android.content.Context;  import android.view.LayoutInflater;  import android.view.View;  import android.view.ViewGroup;  import android.widget.BaseAdapter;  import android.widget.ImageView;  import android.widget.TextView;  import java.util.List;  public class FoodItemAdapter extends BaseAdapter {      private Context context;      private List<FoodItem> foodItemList;      public FoodItemAdapter(Context context, List<FoodItem> foodItemList) {          this.context = context;          this.foodItemList = foodItemList;      }      @Override      public int getCount() {          return foodItemList.size();      }      @Override      public Object getItem(int position) {          return foodItemList.get(position);      }      @Override      public long getItemId(int position) {          return position;      }      @Override      public View getView(int position, View convertView, ViewGroup parent) {          if (convertView == null) {              convertView = LayoutInflater.from(context).inflate(R.layout.list\_item\_food, parent, false);          }          FoodItem currentFoodItem = (FoodItem) getItem(position);          ImageView foodImageView = convertView.findViewById(R.id.food\_image);          TextView foodNameTextView = convertView.findViewById(R.id.food\_name);          TextView foodDescriptionTextView = convertView.findViewById(R.id.food\_description);          TextView foodPriceTextView = convertView.findViewById(R.id.food\_price);          foodImageView.setImageResource(currentFoodItem.getImageResourceId());          foodNameTextView.setText(currentFoodItem.getName());          foodDescriptionTextView.setText(currentFoodItem.getDescription());          foodPriceTextView.setText(String.format("$%.2f", currentFoodItem.getPrice()));          return convertView;      }  } |

**Image Files :**

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**OUTPUT :**

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**Question 6:**

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| --- |
| Create suitable apps to demonstrate following menus in android   1. Options Menu 2. Context Menu 3. Pop Up Menu |

|  |
| --- |
| 1. ***Options Menu*** |

**PROGRAM CODE:**

**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:id="@+id/main"      android:layout\_width="match\_parent"      android:layout\_height="match\_parent"      tools:context=".MainActivity">      <androidx.appcompat.widget.Toolbar          android:id="@+id/toolbar"          android:layout\_width="match\_parent"          android:layout\_height="wrap\_content"          android:background="?attr/colorPrimary"          android:minHeight="?attr/actionBarSize"          android:theme="?attr/actionBarTheme"          app:layout\_constraintTop\_toTopOf="parent" />      <TextView          android:id="@+id/textView"          android:layout\_width="150dp"          android:layout\_height="54dp"          android:layout\_marginStart="130dp"          android:layout\_marginTop="347dp"          android:layout\_marginEnd="131dp"          android:layout\_marginBottom="330dp"          android:text="@string/menubar"          android:textAlignment="center"          android:textSize="24sp"          android:textStyle="bold"          app:layout\_constraintBottom\_toBottomOf="parent"          app:layout\_constraintEnd\_toEndOf="parent"          app:layout\_constraintStart\_toStartOf="parent"          app:layout\_constraintTop\_toTopOf="parent"          tools:ignore="TextSizeCheck" />  </androidx.constraintlayout.widget.ConstraintLayout> |

**res > manu > menu1.xml**

|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?>  <menu xmlns:app="http://schemas.android.com/apk/res-auto"      xmlns:android="http://schemas.android.com/apk/res/android">      <item          android:id="@+id/item1"          android:title="@string/kerala" />      <item          android:id="@+id/item2"          android:title="@string/tamil\_nadu" />      <item          android:id="@+id/item3"          android:title="@string/karnataka" />      <item          android:id="@+id/item4"          android:title="@string/andra\_pradesh" ></item>      <group android:id="@+id/group1" android:checkableBehavior="single">          <item              android:id="@+id/item5"              android:title="@string/gujarat" />          <item              android:id="@+id/item6"              android:title="@string/punjab" ></item>      </group>      <item          android:id="@+id/submenu"          android:title="@string/others" >          <menu >              <item                  android:id="@+id/item7\_1"                  android:title="@string/goa" />              <item                  android:id="@+id/item7\_2"                  android:title="@string/jammu" />          </menu>      </item>  </menu> |

**MainActivity.java**

|  |
| --- |
| package com.example.menubar;  import android.os.Bundle;  import androidx.activity.EdgeToEdge;  import androidx.appcompat.app.AppCompatActivity;  import androidx.core.graphics.Insets;  import androidx.core.view.ViewCompat;  import androidx.core.view.WindowInsetsCompat;  //import menu :  import android.view.Menu;  import android.view.MenuInflater;  import android.view.MenuItem;  import android.widget.Toast;  import androidx.appcompat.widget.Toolbar;  public class MainActivity extends AppCompatActivity {      @Override      protected void onCreate(Bundle savedInstanceState) {          super.onCreate(savedInstanceState);          EdgeToEdge.enable(this);          setContentView(R.layout.activity\_main);          Toolbar toolbar = findViewById(R.id.toolbar);          setSupportActionBar(toolbar);          ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> {              Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());              v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);              return insets;          });      }      @Override      public boolean onCreateOptionsMenu(Menu menu) {          MenuInflater inflater = getMenuInflater();          inflater.inflate(R.menu.menu1, menu);          return true;      }      @Override      public boolean onOptionsItemSelected(MenuItem item) {          //Handling item:          if (item.getItemId() == R.id.item1)              Toast.makeText(MainActivity.this, "Selected Kerala", Toast.LENGTH\_LONG).show();          if (item.getItemId() == R.id.item2)              Toast.makeText(MainActivity.this, "Selected Tamil Nadu", Toast.LENGTH\_LONG).show();          if (item.getItemId() == R.id.item3)              Toast.makeText(MainActivity.this, "Selected Karnataka", Toast.LENGTH\_LONG).show();          if (item.getItemId() == R.id.item4)              Toast.makeText(MainActivity.this, "Selected Andra Pradesh", Toast.LENGTH\_LONG).show();          if (item.getItemId() == R.id.item5)              Toast.makeText(MainActivity.this, "Selected Gujarat", Toast.LENGTH\_LONG).show();          if (item.getItemId() == R.id.item6)              Toast.makeText(MainActivity.this, "Selected Punjab", Toast.LENGTH\_LONG).show();          if (item.getItemId() == R.id.item7\_1)              Toast.makeText(MainActivity.this, "Selected Goa", Toast.LENGTH\_LONG).show();          if (item.getItemId() == R.id.item7\_2)              Toast.makeText(MainActivity.this, "Selected Jammu", Toast.LENGTH\_LONG).show();          return super.onOptionsItemSelected(item);      }  } |

**OUTPUT :**

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| 1. ***Context Menu*** |

**PROGRAM CODE:**

**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:id="@+id/main"      android:layout\_width="match\_parent"      android:layout\_height="match\_parent"      tools:context=".MainActivity">      <TextView          android:id="@+id/tv1"          android:layout\_width="158dp"          android:layout\_height="59dp"          android:text="@string/long\_press\_here"          android:textAlignment="center"          android:textSize="24sp"          android:textStyle="bold"          app:layout\_constraintBottom\_toBottomOf="parent"          app:layout\_constraintEnd\_toEndOf="parent"          app:layout\_constraintStart\_toStartOf="parent"          app:layout\_constraintTop\_toTopOf="parent"          tools:ignore="TextSizeCheck" />  </androidx.constraintlayout.widget.ConstraintLayout> |

**MainActivity.java**

|  |
| --- |
| package com.example.contextmenu;  import android.os.Bundle;  import androidx.activity.EdgeToEdge;  import androidx.appcompat.app.AppCompatActivity;  import androidx.core.graphics.Insets;  import androidx.core.view.ViewCompat;  import androidx.core.view.WindowInsetsCompat;  //  import android.view.ContextMenu;  import android.view.MenuItem;  import android.view.View;  import android.widget.TextView;  import android.graphics.Color;  import androidx.constraintlayout.widget.ConstraintLayout;  public class MainActivity extends AppCompatActivity {      TextView textView;      ConstraintLayout layout;      @Override      protected void onCreate(Bundle savedInstanceState) {          super.onCreate(savedInstanceState);          EdgeToEdge.enable(this);          setContentView(R.layout.activity\_main);          //Link those objects with respective id's that we have given in XML file          textView = (TextView) findViewById(R.id.tv1);          layout = (ConstraintLayout) findViewById(R.id.main);          //Here you have to register a view for context menu.          //You can register any view like listview . image View , textview , button etc.          registerForContextMenu(textView);          ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> {              Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());              v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);              return insets;          });      }      @Override      public void onCreateContextMenu(ContextMenu menu , View v , ContextMenu.ContextMenuInfo menuInfo){          super.onCreateContextMenu(menu,v,menuInfo);          //You can set menu header with title icon etc          menu.setHeaderTitle("Choose a color");          //Add menu items          menu.add(0,v.getId(),0,"Yellow");          menu.add(0,v.getId(),0,"Gray");          menu.add(0,v.getId(),0,"Cyan");      }      //Menu item select listener:      @Override      public boolean onContextItemSelected(MenuItem item){          if(item.getTitle() == "Yellow"){              layout.setBackgroundColor(Color.YELLOW);          }          if(item.getTitle() == "Gray"){              layout.setBackgroundColor(Color.GRAY);          }          if(item.getTitle() == "Cyan"){              layout.setBackgroundColor(Color.CYAN);          }          return true;      }  } |

**OUTPUT :**

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| --- |
| 1. ***Pop up Menu*** |

**PROGRAM CODE:**

**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:id="@+id/main"      android:layout\_width="match\_parent"      android:layout\_height="match\_parent"      tools:context=".MainActivity">      <Button          android:id="@+id/b1"          android:layout\_width="105dp"          android:layout\_height="62dp"          android:layout\_marginStart="160dp"          android:layout\_marginTop="179dp"          android:layout\_marginEnd="146dp"          android:layout\_marginBottom="490dp"          android:onClick="showPopUp"          android:text="@string/click\_here"          app:layout\_constraintBottom\_toBottomOf="parent"          app:layout\_constraintEnd\_toEndOf="parent"          app:layout\_constraintStart\_toStartOf="parent"          app:layout\_constraintTop\_toTopOf="parent" />  </androidx.constraintlayout.widget.ConstraintLayout> |

**res > menu > popup\_menu.xml**

|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?>  <menu      xmlns:android="http://schemas.android.com/apk/res/android"      android:title="Select a Language">      <item          android:id="@+id/item1"          android:title="Java"          />      <item          android:id="@+id/item2"          android:title="Android"          />      <item          android:id="@+id/item3"          android:title="C"          />      <item          android:id="@+id/item4"          android:title="Python"          />  </menu> |

**MainActivity.java**

|  |
| --- |
| package com.example.popupmenu;  import android.os.Bundle;  import androidx.activity.EdgeToEdge;  import androidx.appcompat.app.AppCompatActivity;  import androidx.core.graphics.Insets;  import androidx.core.view.ViewCompat;  import androidx.core.view.WindowInsetsCompat;  //  import android.view.MenuInflater;  import android.view.MenuItem;  import android.view.View;  import android.widget.Button;  import android.widget.PopupMenu;  import android.widget.Toast;  public class MainActivity extends AppCompatActivity {      Button button;      @Override      protected void onCreate(Bundle savedInstanceState) {          super.onCreate(savedInstanceState);          EdgeToEdge.enable(this);          setContentView(R.layout.activity\_main);          ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> {              Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());              v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);              return insets;          });      }      public void showPopUp(View v){          button=(Button) findViewById(R.id.b1);          PopupMenu p =new PopupMenu(MainActivity.this , button);          p.getMenuInflater().inflate(R.menu.popup\_menu,p.getMenu());          p.setOnMenuItemClickListener(new PopupMenu.OnMenuItemClickListener() {              @Override              public boolean onMenuItemClick(MenuItem menuItem) {                  Toast.makeText(MainActivity.this, menuItem.getTitle(),                          Toast.LENGTH\_SHORT).show();                  return true;              }          });      p.show();      }  } |

**OUTPUT :**

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**Question 7:**

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| Create suitable apps to demonstrate the following  ● Action Bar  ● Action Bar & Tabs  ● View Pager  ● Action Bar & View Pager |

**PROGRAM CODE:**

**activity\_main.xml**

|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?>  <RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"      xmlns:app="http://schemas.android.com/apk/res-auto"      android:layout\_width="match\_parent"      android:layout\_height="match\_parent">      <androidx.appcompat.widget.Toolbar          android:id="@+id/toolbar"          android:layout\_width="match\_parent"          android:layout\_height="?attr/actionBarSize"          android:background="?attr/colorPrimary"          android:elevation="4dp"          android:theme="@style/ThemeOverlay.AppCompat.ActionBar"          android:popupTheme="@style/ThemeOverlay.AppCompat.Light" />      <com.google.android.material.tabs.TabLayout          android:id="@+id/tab\_layout"          android:layout\_width="match\_parent"          android:layout\_height="wrap\_content"          android:layout\_below="@id/toolbar"          app:tabMode="fixed"          app:tabGravity="fill"          app:tabIndicatorColor="@android:color/white"          app:tabSelectedTextColor="@android:color/white" />      <androidx.viewpager.widget.ViewPager          android:id="@+id/view\_pager"          android:layout\_width="match\_parent"          android:layout\_height="match\_parent"          android:layout\_below="@id/tab\_layout" />  </RelativeLayout> |

**fragment\_tab.xml**

|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?>  <RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"      android:layout\_width="match\_parent"      android:layout\_height="match\_parent"      android:padding="16dp">      <TextView          android:id="@+id/tab\_text"          android:layout\_width="wrap\_content"          android:layout\_height="wrap\_content"          android:layout\_centerInParent="true"          android:textSize="24sp"          android:textColor="@android:color/black" />      <ImageView          android:id="@+id/tab\_image"          android:layout\_width="wrap\_content"          android:layout\_height="wrap\_content"          android:layout\_below="@id/tab\_text"          android:layout\_centerHorizontal="true"          android:layout\_marginTop="16dp"          android:src="@android:drawable/ic\_menu\_gallery" />  </RelativeLayout> |

**res > menu >menu\_main.xml**

|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?>  <menu xmlns:android="http://schemas.android.com/apk/res/android"      xmlns:app="http://schemas.android.com/apk/res-auto">      <item          android:id="@+id/action\_search"          android:title="Search"          app:showAsAction="ifRoom" />      <item          android:id="@+id/action\_settings"          android:title="Settings"          app:showAsAction="never" />  </menu> |

**MainActivity.java**

|  |
| --- |
| package com.example.Actionbar;    import androidx.appcompat.app.AppCompatActivity;  import androidx.appcompat.widget.Toolbar;  import androidx.viewpager.widget.ViewPager;  import android.os.Bundle;  import android.view.Menu;  import android.view.MenuInflater;  import com.google.android.material.tabs.TabLayout;  public class MainActivity extends AppCompatActivity {      private Toolbar toolbar;      private TabLayout tabLayout;      private ViewPager viewPager;      private ViewPagerAdapter adapter;      @Override      protected void onCreate(Bundle savedInstanceState) {          super.onCreate(savedInstanceState);          setContentView(R.layout.activity\_main);          toolbar = findViewById(R.id.toolbar);          setSupportActionBar(toolbar);          tabLayout = findViewById(R.id.tab\_layout);          viewPager = findViewById(R.id.view\_pager);          adapter = new ViewPagerAdapter(getSupportFragmentManager());          viewPager.setAdapter(adapter);          tabLayout.setupWithViewPager(viewPager);      }      @Override      public boolean onCreateOptionsMenu(Menu menu) {          MenuInflater inflater = getMenuInflater();          inflater.inflate(R.menu.menu\_main, menu);          return true;      }  } |

**TabFragment.java**

|  |
| --- |
| package com.example.Actionbar;  import android.annotation.SuppressLint;  import android.os.Bundle;  import android.view.LayoutInflater;  import android.view.View;  import android.view.ViewGroup;  import android.widget.ImageView;  import android.widget.TextView;  import androidx.annotation.NonNull;  import androidx.annotation.Nullable;  import androidx.fragment.app.Fragment;  public class TabFragment extends Fragment {      private static final String ARG\_POSITION = "position";      public static TabFragment newInstance(int position) {          TabFragment fragment = new TabFragment();          Bundle args = new Bundle();          args.putInt(ARG\_POSITION, position);          fragment.setArguments(args);          return fragment;      }      @SuppressLint("SetTextI18n")      @Nullable      @Override      public View onCreateView(@NonNull LayoutInflater inflater, @Nullable ViewGroup container, @Nullable Bundle savedInstanceState) {          View rootView = inflater.inflate(R.layout.fragment\_tab, container, false);          int position = getArguments().getInt(ARG\_POSITION);          @SuppressLint({"MissingInflatedId", "LocalSuppress"}) TextView textView = rootView.findViewById(R.id.tab\_text);          ImageView imageView = rootView.findViewById(R.id.tab\_image);          switch (position) {              case 0:                  textView.setText("Tab 1 Content");                 imageView.setImageResource(R.drawable.aimg1);                  break;              case 1:                  textView.setText("Tab 2 Content");                 imageView.setImageResource(R.drawable.aimg2);                  break;              case 2:                  textView.setText("Tab 3 Content");                 imageView.setImageResource(R.drawable.aimg3);                  break;          }          return rootView;      }  } |

**ViewPagerAdapter.java**

|  |
| --- |
| package com.example.Actionbar;  import androidx.annotation.NonNull;  import androidx.fragment.app.Fragment;  import androidx.fragment.app.FragmentManager;  import androidx.fragment.app.FragmentPagerAdapter;  public class ViewPagerAdapter extends FragmentPagerAdapter {      private String[] tabTitles = new String[]{"Tab 1", "Tab 2", "Tab 3"};      public ViewPagerAdapter(@NonNull FragmentManager fm) {          super(fm, BEHAVIOR\_RESUME\_ONLY\_CURRENT\_FRAGMENT);      }      @NonNull      @Override      public Fragment getItem(int position) {          return TabFragment.newInstance(position);      }      @Override      public int getCount() {          return tabTitles.length; // Number of tabs      }      @Override      public CharSequence getPageTitle(int position) {          return tabTitles[position];      }  } |

**OUTPUT :**

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