KARACHI INSTITUTE OF ECONOMICS & TECHNOLOGY
College of Engineering
(Department of Software Engineering)

CS3306 – Mobile Application Development
Complex Engineering Problem

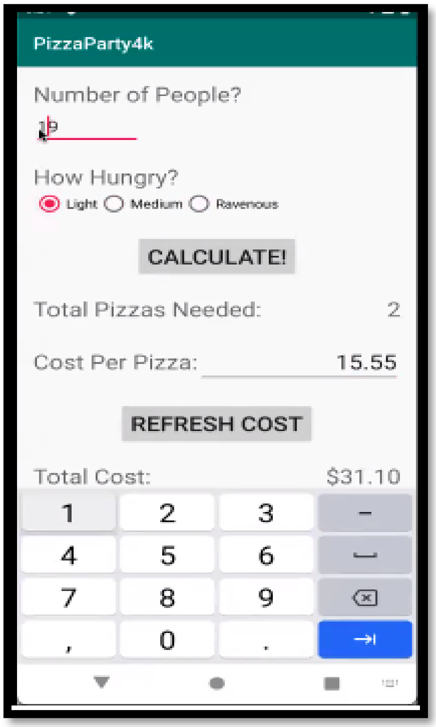
Student name: __Rehan Abu Hashir___ **Faculty Signature: ______________________**

Student ID: __10673_______________ **Date: __________________________________**

CLOs		PLOs		Bloom Taxonomy	
CLO-1		PLO-1: Engineering Knowledge		C1: Knowledge	
CLO-2		PLO-03: Design/ Development of Solution		C3: Apply	
CLO-3		PLO-05: Modern Tools Usage		C5:Innovation	
SNo.	**Complex Engineering Solving Attributes**	**Excellent (75-100%)**	**Average (50-75%)**	**Poor (<50%)**	**Marks**
CLO-1 (20%)	**WP1- Depth of Engineering Knowledge** Resolved with forefront in-depth engineering knowledge	The student states the problem clearly and has sufficient in-depth knowledge to solve the problem.	The student inadequately defines the problem and has insufficient in-depth knowledge to solve the problem.	The student cannot define the problem and has a lack of knowledge to solve the problem.	
CLO-2 (30%) CLO-3 (50%)	**WP3 - Depth of analysis required** Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models	Identifies the correct approach for solving the problem that applies within a specific context and obtained the output as per requirement.	Identifies the improper approach for solving the problem that applies within a specific context and obtained slightly different output as per requirement.	Unable to identify the approach for solving the problem that applies within a specific context that will lead to wrong output.	
				Total Marks:	

Problem Statement: **(Marks: __/10)**

You will make a mobile app that calculates how many pizzas a user needs based on the hunger level of their guests. You will need to implement the necessary resources, layout, and event listeners to accomplish this task. The video link below will also explain clearly that what is required.



PizzaParty4k

Number of People?

19

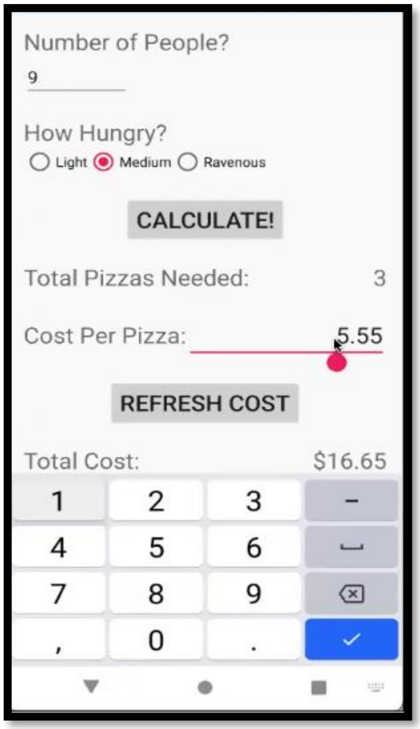
How Hungry?

● Light ○ Medium ○ Ravenous

Total Pizzas Needed: 2

Cost Per Pizza: 15.55

Total Cost: $31.10



Number of People?

9

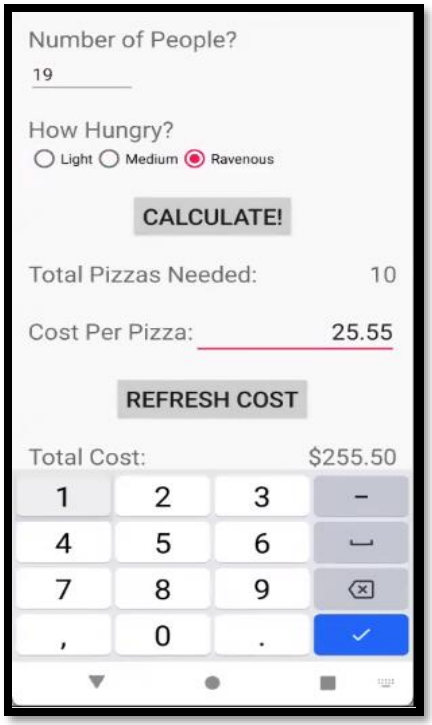
How Hungry?

○ Light ● Medium ○ Ravenous

Total Pizzas Needed: 3

Cost Per Pizza: 5.55

Total Cost: $16.65



Number of People?

19

How Hungry?

○ Light ○ Medium ● Ravenous

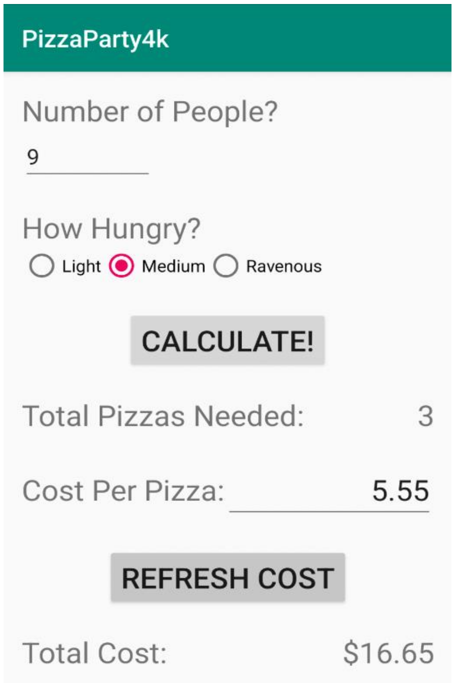
Total Pizzas Needed: 10

Cost Per Pizza: 25.55

Total Cost: $255.50

Part I - View: Create the Layout

The full layout is shown below.



PizzaParty4k

Number of People?

9

How Hungry?

○ Light ● Medium ○ Ravenous

Total Pizzas Needed: 3

Cost Per Pizza: 5.55

Total Cost: $16.65

In this exercise, there isn't a tree to traverse to build it up. You will need to create the container and element structure by breaking the image into components. As a hint, you'll need four LinearLayouts, two EditTexts, a RadioGroup of RadioButtons, and some other components. How those all go together is for you to organize. You may need to do some additional research as to how each of the View objects work.

As you are building up the layout, you'll need to make sure you are creating the appropriate string resource for each piece of text.

Part II - Activity: Add in the Logic

Next, we'll wire up our two buttons. The calculate button will take the values from the Number of People and How Hungry inputs to calculate the number of pizzas needed. The How Hungry radio buttons determine how many slices each person will eat.

- Light Hunger - 1 slice per person
- Medium Hunger - 2 slices per person
- Ravenous Hunger - 4 slices per person

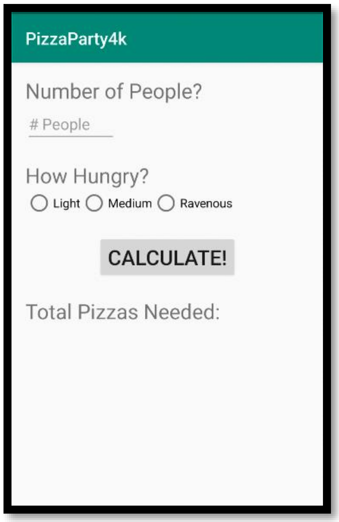
Once we know the total number of slices needed for all people, we can now compute the number of pizzas needed. Each pizza is comprised of 8 slices and we can only order whole pizzas. Thus if there are 9 medium hunger people, then 18 slices are needed or 3 pizzas. Display the number of pizzas needed in the appropriate TextView. As with the layout piece in Part I, there may be additional research needed to interact with the EditText and RadioGroup objects.

After we know the number of pizzas, we'll then calculate the total cost. By default, each pizza is $5.55. Display the cost for all the pizzas, with a $, in the appropriate TextView.

The user is able to change the price per pizza. Upon doing so, the user can then press the refresh cost button to update the total cost. There are now two triggers to update the total cost, so be sure to properly encapsulate the logic for this calculation.

Part III - View & Activity: UX/UI (or UI/UX)

When the user first opens the app, their view should be as shown below.



The total number of pizzas and the associated costs are initially hidden and not visible. After the calculate button is pressed for the first time, then those elements become visible. Watch the demo video above to see the expected flow. Again, some additional research will be needed to accomplish this task.

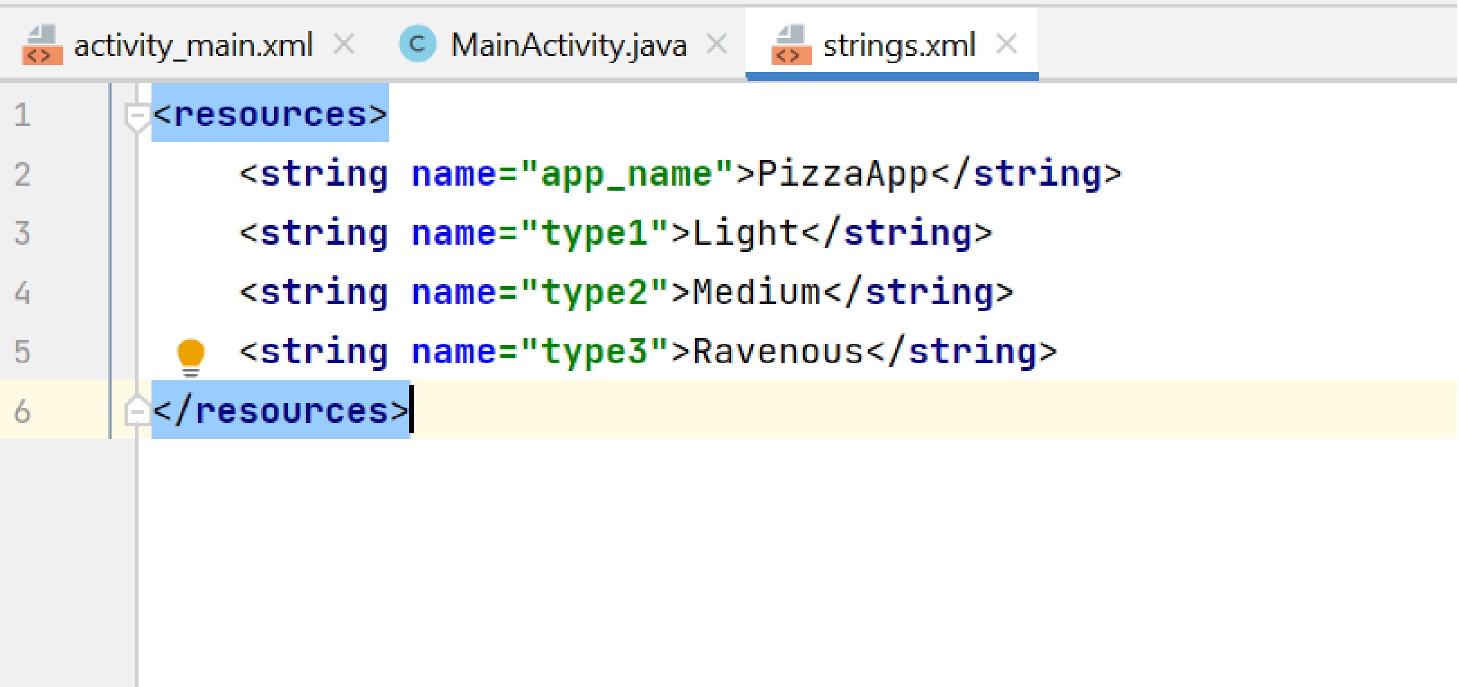
Grading Rubric

Your submission will be graded according to the following rubric.

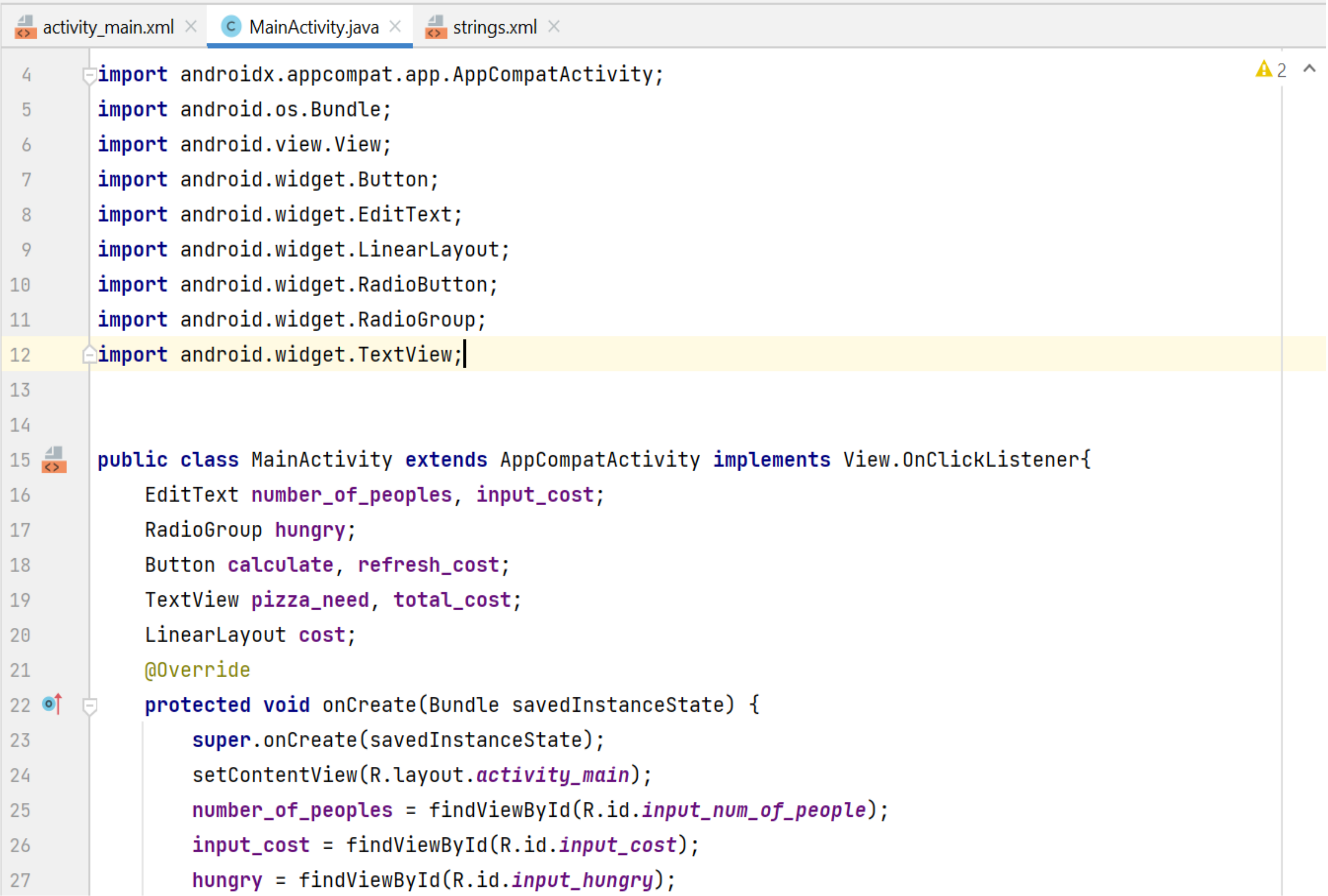
CLO	Percentage	Requirement Description
CLO-1	15%	Layout matches the provided image.
	5%	Event listeners implemented correctly.
CLO-2	15%	String resources used appropriately.
	15%	UI/UX matches with the diagram/front end provided. Cost is initially hidden.
CLO-3	35%	App functions as expected (number of pizzas and cost calculated correctly) and structured correctly (Activity, Layout, Strings).
	10%	Submission includes source code
	5%	Submission compiles and executes without error.

Submission

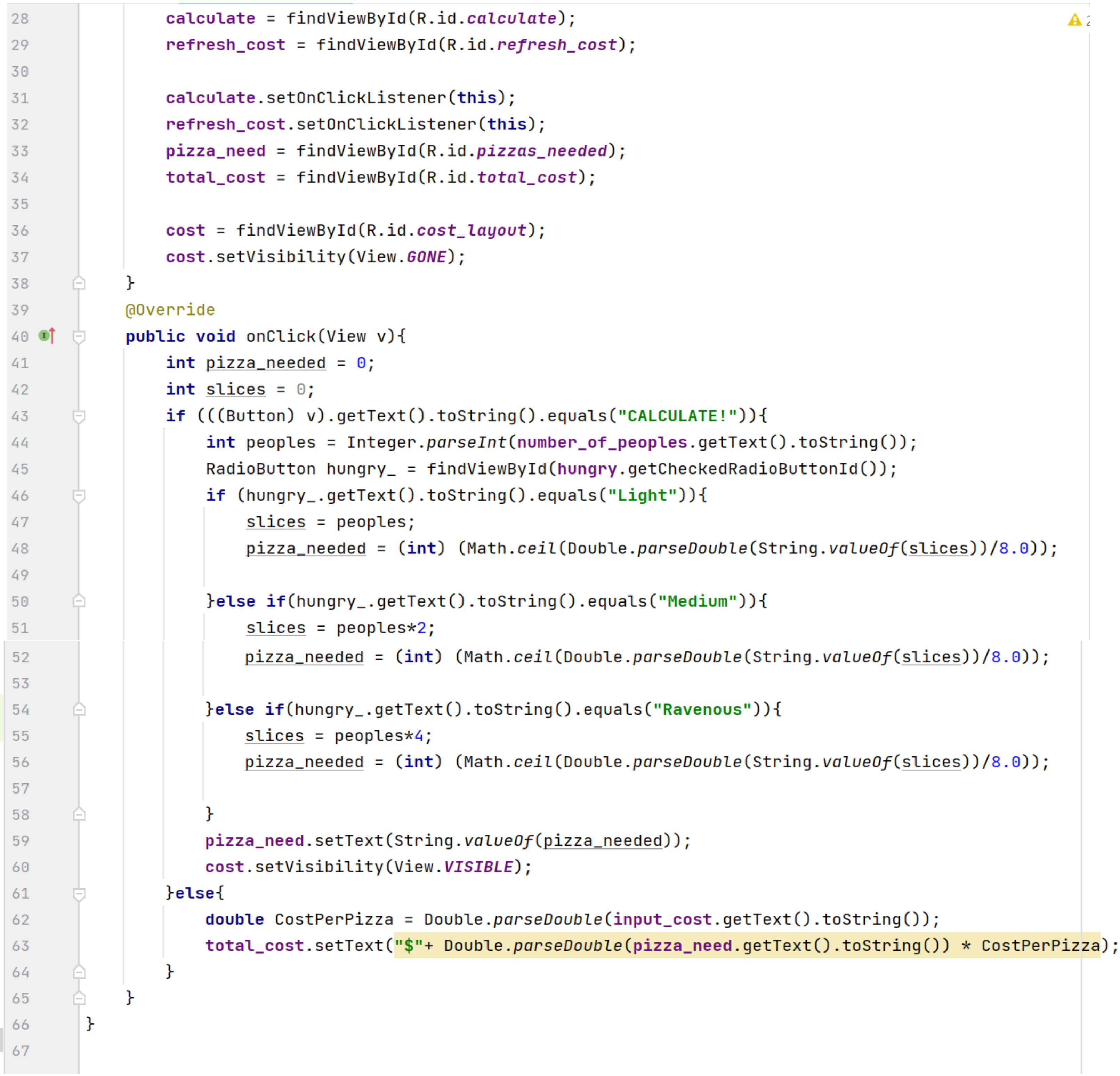
Solution:



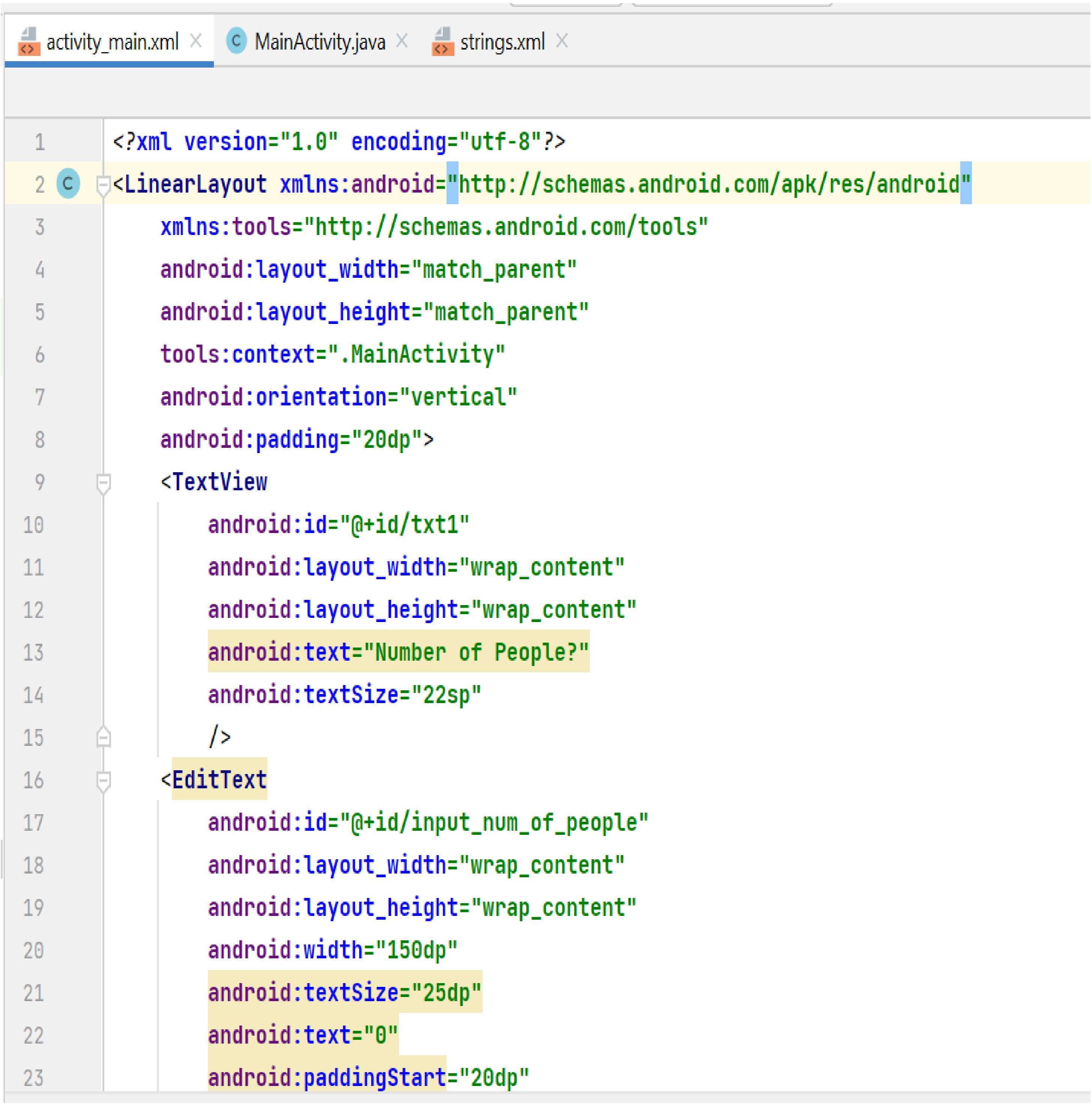
```xml
<resources>
    <string name="app_name">PizzaApp</string>
    <string name="type1">Light</string>
    <string name="type2">Medium</string>
    <string name="type3">Ravenous</string>
</resources>
```



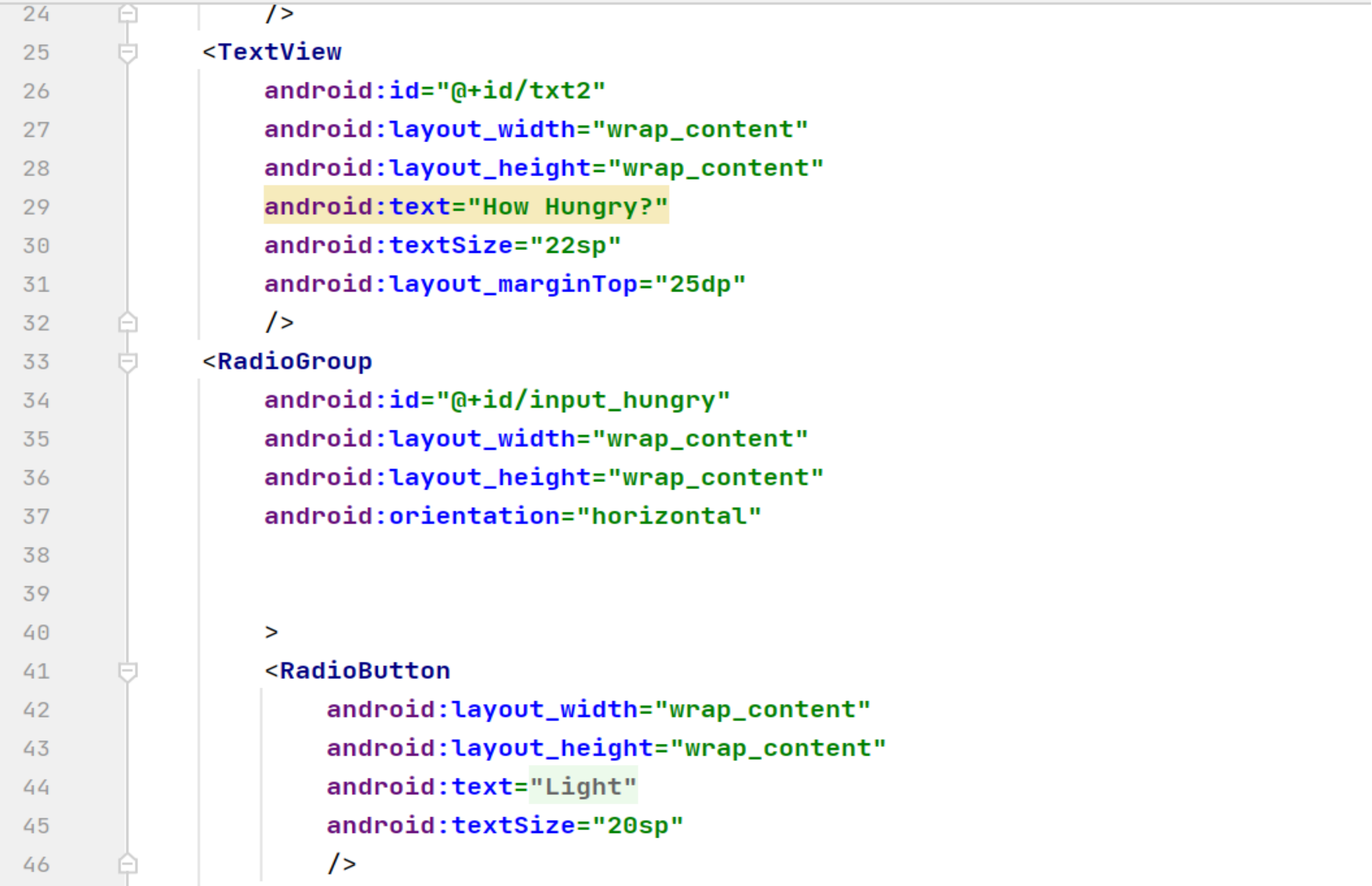
```java
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.LinearLayout;
import android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.TextView;


public class MainActivity extends AppCompatActivity implements View.OnClickListener{
    EditText number_of_peoples, input_cost;
    RadioGroup hungry;
    Button calculate, refresh_cost;
    TextView pizza_need, total_cost;
    LinearLayout cost;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        number_of_peoples = findViewById(R.id.input_num_of_people);
        input_cost = findViewById(R.id.input_cost);
        hungry = findViewById(R.id.input_hungry);
```



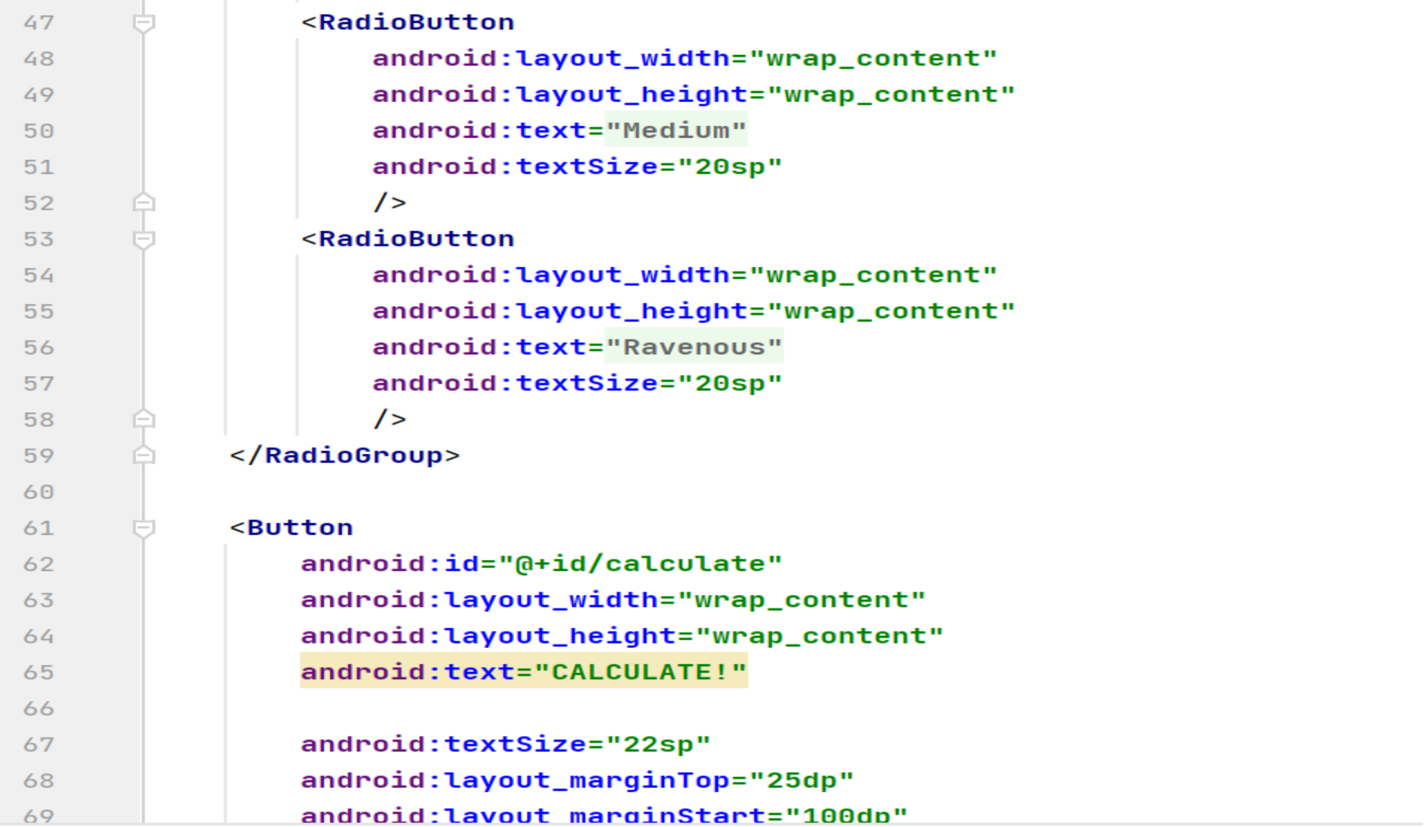
```
        calculate = findViewById(R.id.calculate);
        refresh_cost = findViewById(R.id.refresh_cost);

        calculate.setOnClickListener(this);
        refresh_cost.setOnClickListener(this);
        pizza_need = findViewById(R.id.pizzas_needed);
        total_cost = findViewById(R.id.total_cost);

        cost = findViewById(R.id.cost_layout);
        cost.setVisibility(View.GONE);
    }
    @Override
    public void onClick(View v){
        int pizza_needed = 0;
        int slices = 0;
        if (((Button) v).getText().toString().equals("CALCULATE!")){
            int peoples = Integer.parseInt(number_of_peoples.getText().toString());
            RadioButton hungry_ = findViewById(hungry.getCheckedRadioButtonId());
            if (hungry_.getText().toString().equals("Light")){
                slices = peoples;
                pizza_needed = (int) (Math.ceil(Double.parseDouble(String.valueOf(slices))/8.0));

            }else if(hungry_.getText().toString().equals("Medium")){
                slices = peoples*2;
                pizza_needed = (int) (Math.ceil(Double.parseDouble(String.valueOf(slices))/8.0));

            }else if(hungry_.getText().toString().equals("Ravenous")){
                slices = peoples*4;
                pizza_needed = (int) (Math.ceil(Double.parseDouble(String.valueOf(slices))/8.0));

            }
            pizza_need.setText(String.valueOf(pizza_needed));
            cost.setVisibility(View.VISIBLE);
        }else{
            double CostPerPizza = Double.parseDouble(input_cost.getText().toString());
            total_cost.setText("$"+ Double.parseDouble(pizza_need.getText().toString()) * CostPerPizza);
        }
    }
}
```



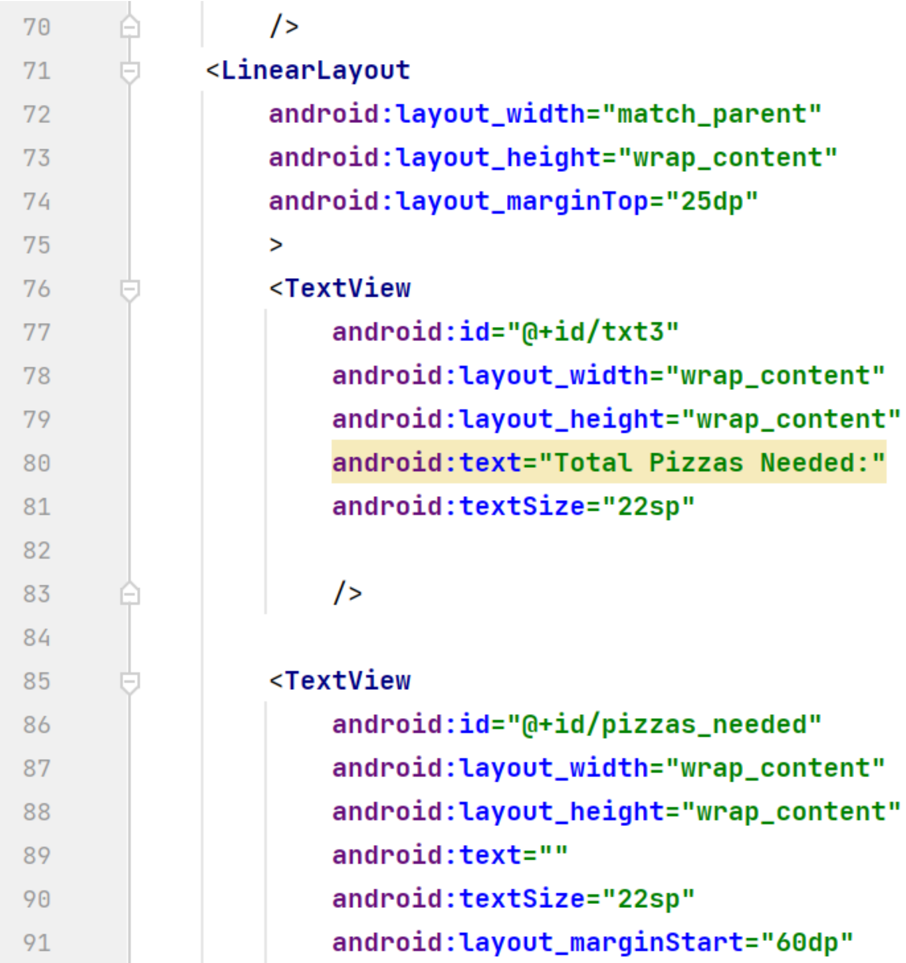
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity"
    android:orientation="vertical"
    android:padding="20dp">
    <TextView
        android:id="@+id/txt1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Number of People?"
        android:textSize="22sp"
        />
    <EditText
        android:id="@+id/input_num_of_people"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:width="150dp"
        android:textSize="25dp"
        android:text="0"
        android:paddingStart="20dp"
```



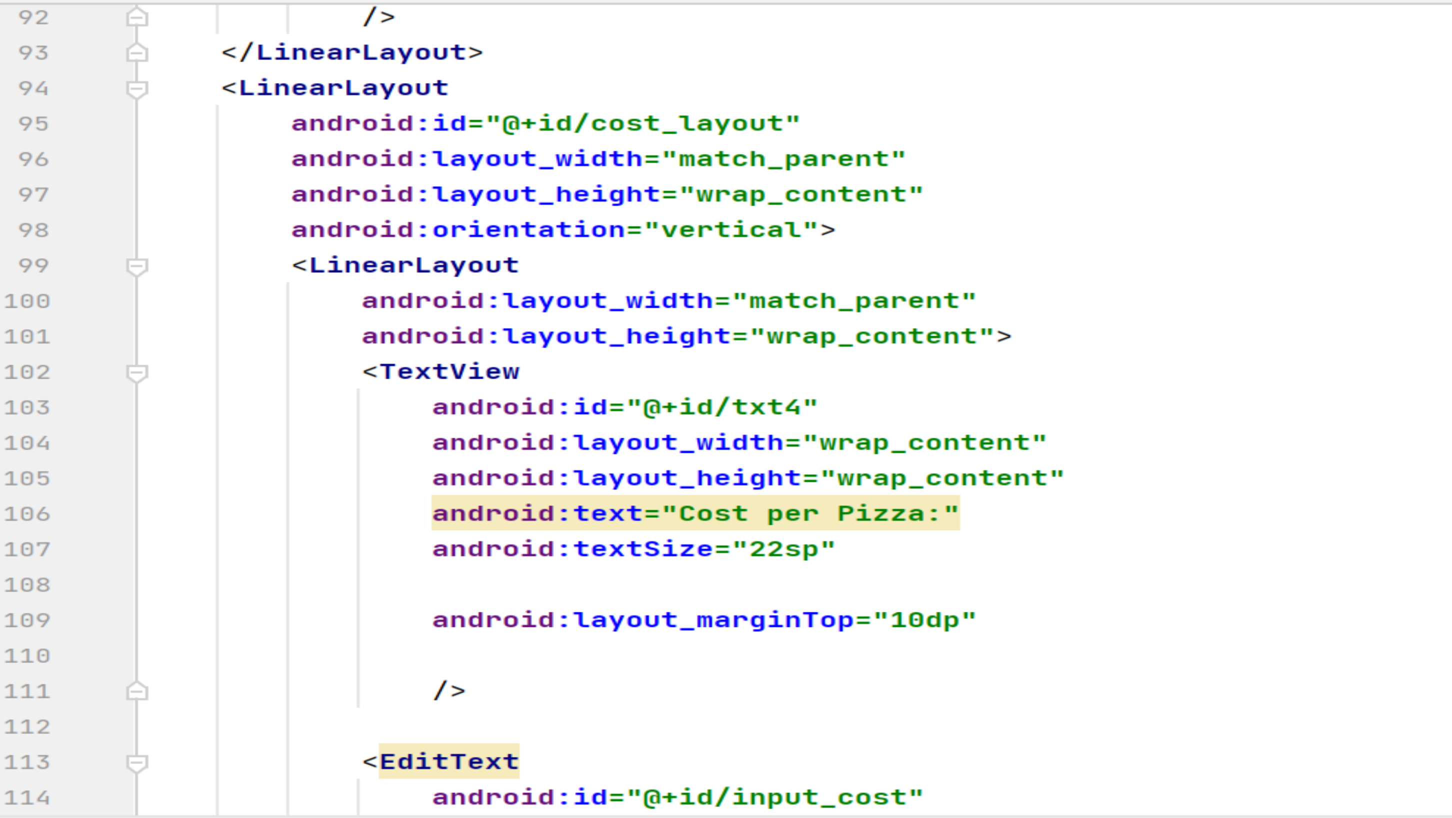
```
        />
    <TextView
        android:id="@+id/txt2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="How Hungry?"
        android:textSize="22sp"
        android:layout_marginTop="25dp"
        />
    <RadioGroup
        android:id="@+id/input_hungry"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="horizontal"


        >
        <RadioButton
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Light"
            android:textSize="20sp"
            />
```



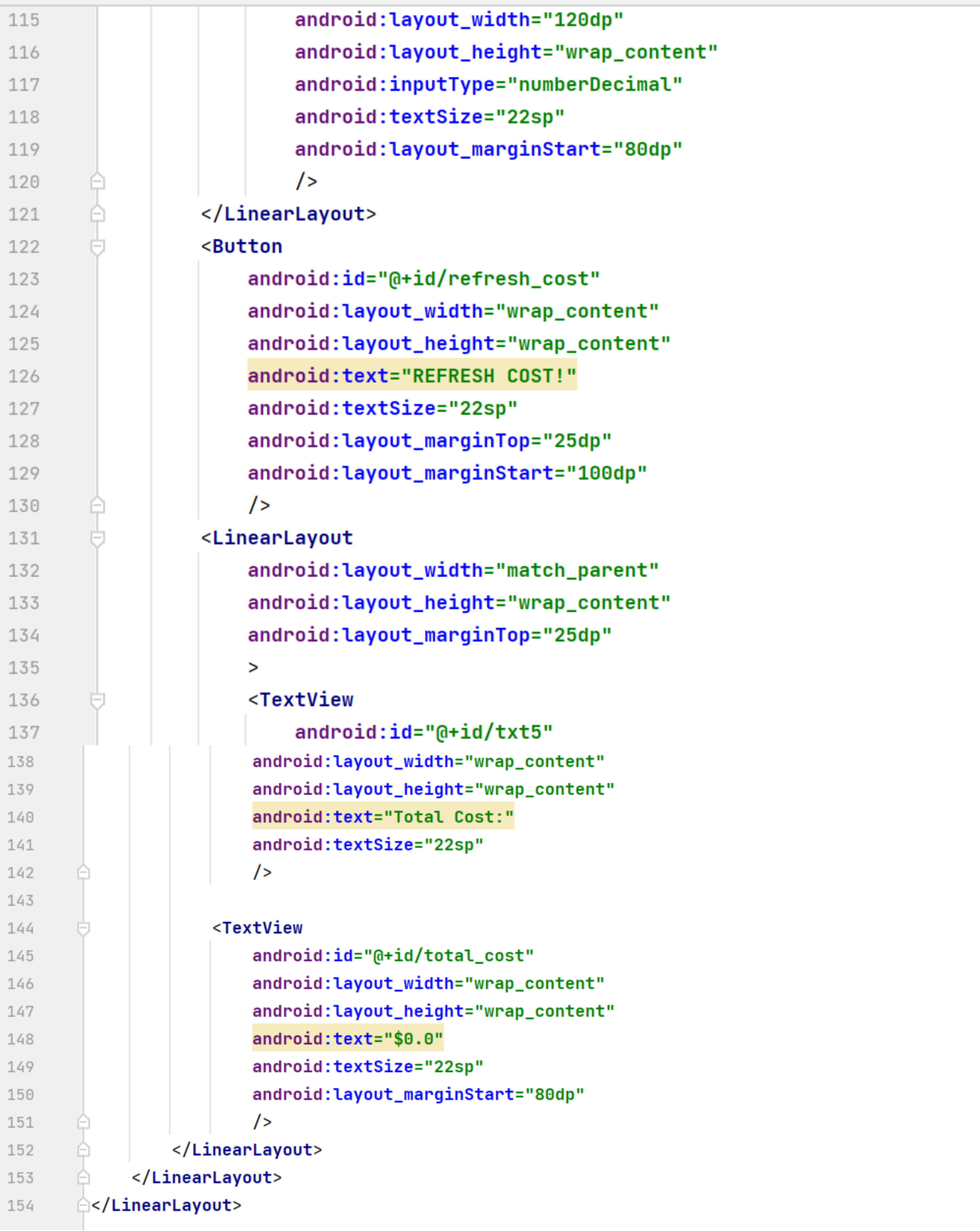
```
        <RadioButton
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Medium"
            android:textSize="20sp"
            />
        <RadioButton
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Ravenous"
            android:textSize="20sp"
            />
    </RadioGroup>

    <Button
        android:id="@+id/calculate"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="CALCULATE!"

        android:textSize="22sp"
        android:layout_marginTop="25dp"
        android:layout_marginStart="100dp"
```



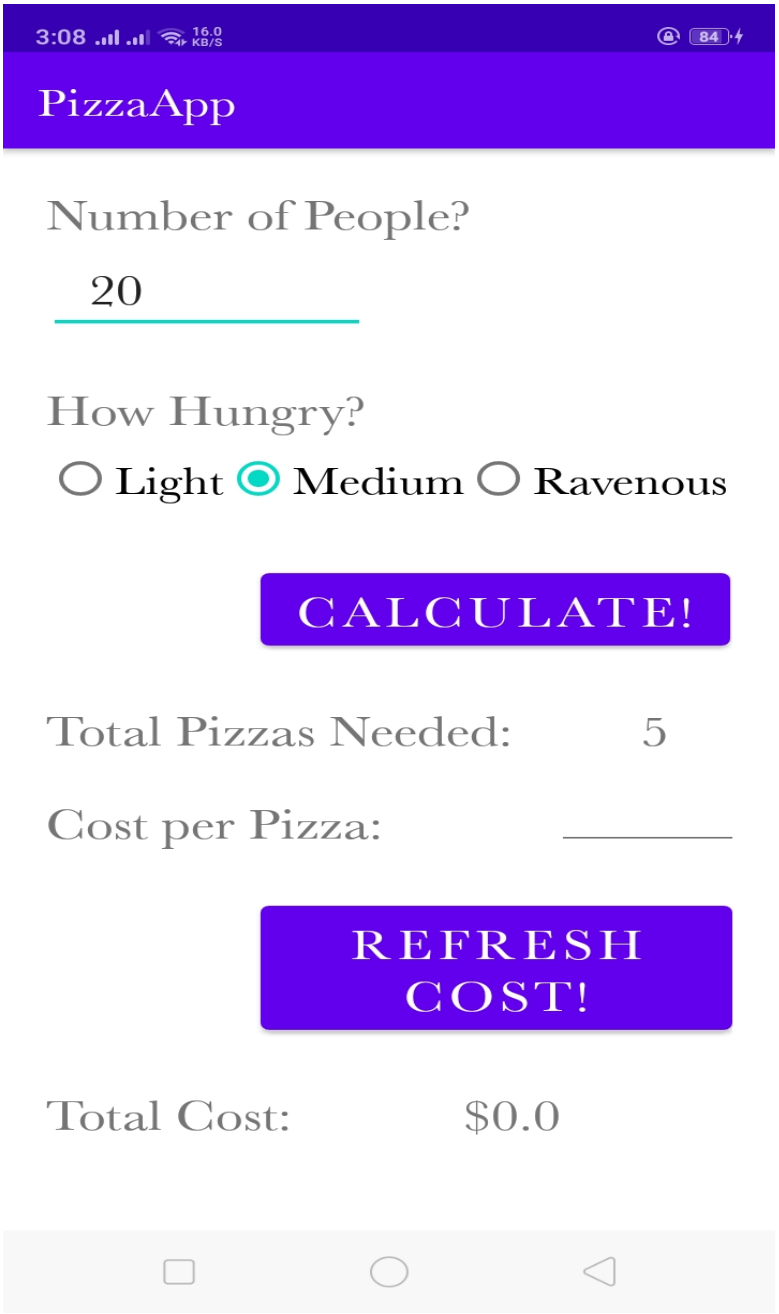
```xml
        />
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="25dp"
        >
        <TextView
            android:id="@+id/txt3"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Total Pizzas Needed:"
            android:textSize="22sp"

            />

        <TextView
            android:id="@+id/pizzas_needed"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text=""
            android:textSize="22sp"
            android:layout_marginStart="60dp"
```



```xml
            />
    </LinearLayout>
    <LinearLayout
        android:id="@+id/cost_layout"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="vertical">
        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content">
            <TextView
                android:id="@+id/txt4"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="Cost per Pizza:"
                android:textSize="22sp"

                android:layout_marginTop="10dp"

                />

            <EditText
                android:id="@+id/input_cost"
```



```xml
                android:layout_width="120dp"
                android:layout_height="wrap_content"
                android:inputType="numberDecimal"
                android:textSize="22sp"
                android:layout_marginStart="80dp"
                />
        </LinearLayout>
        <Button
            android:id="@+id/refresh_cost"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="REFRESH COST!"
            android:textSize="22sp"
            android:layout_marginTop="25dp"
            android:layout_marginStart="100dp"
            />
        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginTop="25dp"
            >
            <TextView
                android:id="@+id/txt5"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="Total Cost:"
                android:textSize="22sp"
                />

            <TextView
                android:id="@+id/total_cost"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="$0.0"
                android:textSize="22sp"
                android:layout_marginStart="80dp"
                />
        </LinearLayout>
    </LinearLayout>
</LinearLayout>
```



Number of People?

20

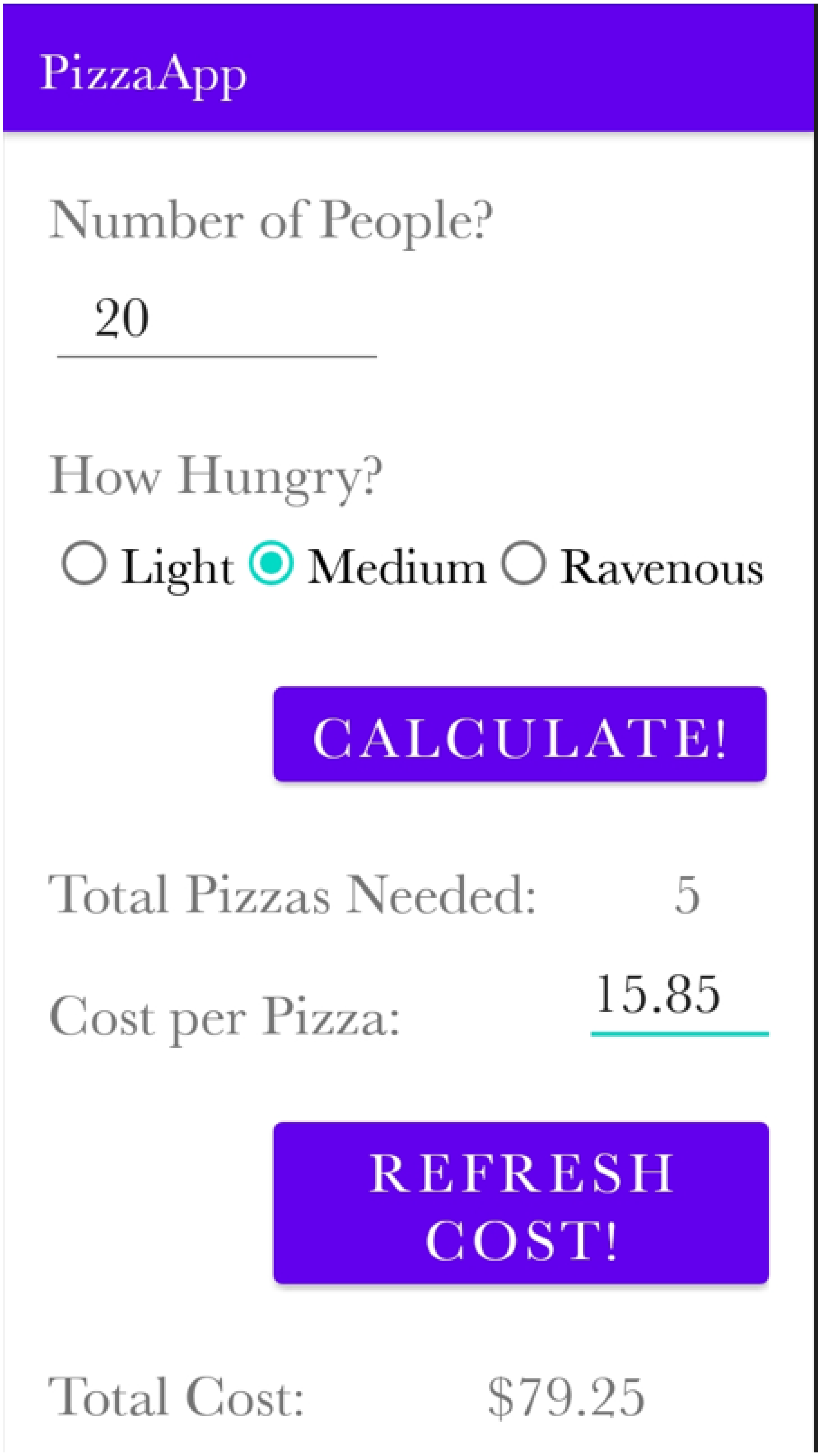
How Hungry?

○ Light ● Medium ○ Ravenous

Total Pizzas Needed: 5

Cost per Pizza: ________

Total Cost: $0.0



Number of People?

20

How Hungry?

○ Light ● Medium ○ Ravenous

Total Pizzas Needed: 5

Cost per Pizza: 15.85

Total Cost: $79.25