Sarawak Campus

Assignment Cover Sheet

(for individual and group assignments)

This cover sheet is to be attached to all assignments, both hard copy and electronic format

ASSIGNMENT DETAILS

Unit Code	COS30017	Unit Title	Software Development for Mobile Devices
Tutorial/Lab Group	2	Lecturer/Tutor Name	Ms. Marlene Lu
Assignment Title	Formative Assignment - 02		
Due date	10/07/2019	Date Received	10/03/2019

DECLARATION

For both individual and group assignments, in the case of assignment submission on behalf of another student, it is assumed that permission has been given. The University takes no responsibility for any loss, damage, theft, or alteration of the assignment.

To be completed if this is an individual assignment

I declare that this assignment is my individual work. I have not worked collaboratively, nor have I copied from any other student's work or from any other source/s, except where due acknowledgment is made explicitly in the text, nor has any part been written for me by another person.

Student Details	Student ID Number	Student Name	Student Signature
Student 1	100085926	Darren F.Chan Chyun Yaw	Darren Frederick Chan Chyun Yaw Digitally signed by Darren Frederick Chan Chyun Yaw Date: 2019.10.23 10:41:43 +08'00'

To be completed if this is a group assignment

We declare that this is a group assignment and that no part of this submission has been copied from any other student's work or from any other source except where due acknowledgment is made explicitly in the text, nor has any part been written for us by another person.

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Student 1			
Student 2			
Student 3			
Student 4			
Student 5			

MARKER'S COMMENTS

Total Mark		Marker's Signature		Date	

EXTENSION CERTIFICATE

This assignment has been given an extension by

Unit Convenor			
Extended due date		Date Received	

COS30017 – Software Development for Mobile Devices

Formative Assignment 2

Task 1

Java Code

```
package com.example.task1;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.content.ContextCompat;

import android.content.res.Configuration;
import android.graphics.Color;
import android.media.MediaPlayer;
import android.os.Bundle;
import android.provider.MediaStore;
import android.util.Log;
import android.view.View;
import android.widget.Button;

public class MainActivity extends AppCompatActivity {
    private Button btn_sneeze,btn_blow,btn_meds;
    private View inner,outer;
    static int state = 2;
    static int health=10;


    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        initUI();
    }
    private void sneeze(){
        final MediaPlayer mp=MediaPlayer.create(this,R.raw.sneeze2);
        mp.start();
    }
    private void blow(){
        final MediaPlayer mp=MediaPlayer.create(this,R.raw.blow_nose);
        mp.start();
    }
    private void meds(){
        final MediaPlayer mp=MediaPlayer.create(this,R.raw.slurp);
        mp.start();
    }
    private void initUI(){
        btn_sneeze=findViewById(R.id.button_sneeze);
        btn_blow=findViewById(R.id.button_blow);
        btn_meds=findViewById(R.id.button_take_medication);
        outer=findViewById(R.id.vertical_outer);
        inner=findViewById(R.id.viewLinearLayout);
```

```
    Log.d("health",String.valueOf(health));
    btn_sneeze.setOnClickListener(new View.OnClickListener(){
        @Override
        public void onClick(View view) {
            sneeze();
            state=0;
            health--;
            health();
        }
    });


    btn_blow.setOnClickListener(new View.OnClickListener(){
        @Override
        public void onClick(View view) {
            blow();
            state=1;

        }
    });

    btn_meds.setOnClickListener(new View.OnClickListener(){
        @Override
        public void onClick(View view) {
            if(health>=10){
                Log.d("message","Health is at >=10");
            }
            else{
                meds();
                if(health+2>10){
                    health++;
                    health();
                }else {
                    health += 2;
                    health();
                }
            }
        }
    });
}

@Override
public void onConfigurationChanged(Configuration newConfig) {
    super.onConfigurationChanged(newConfig);
    if(state==0){
        blow();
        state=1;
    }else{
        sneeze();
        state=0;
        health--;
        health();
    }

}
```

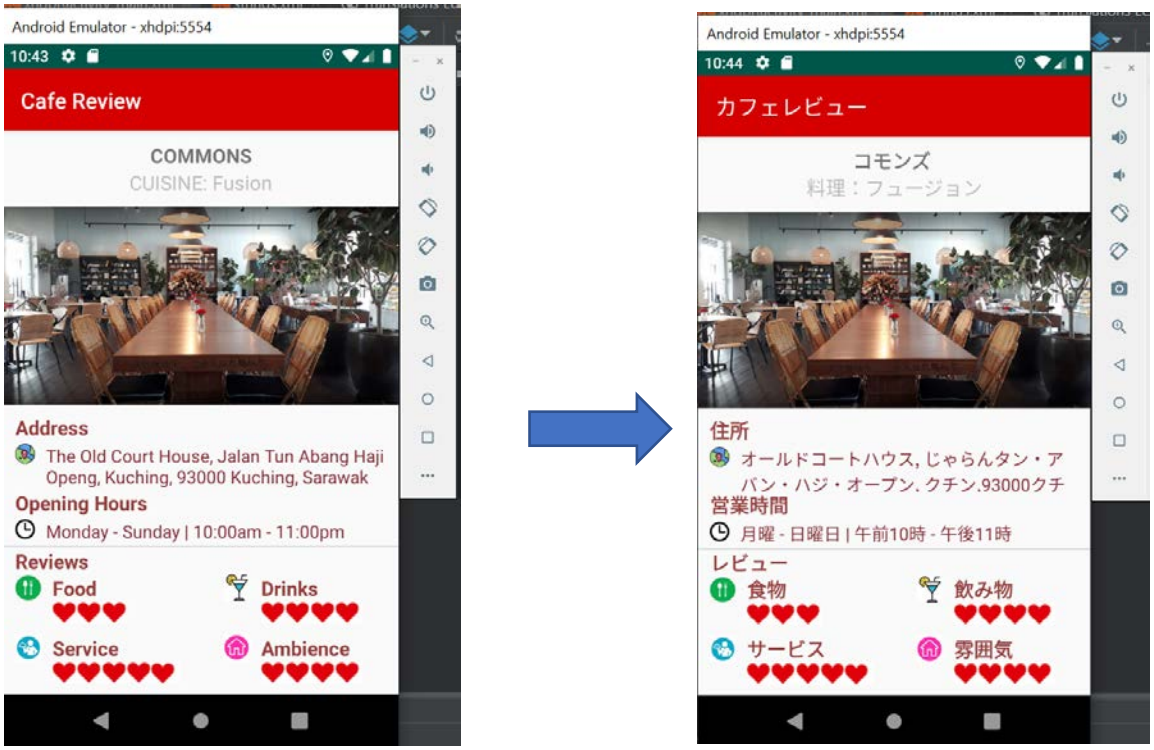
```
    private void checkHealth(){
        if(health>5 && health<=7){
            outer.setBackgroundColor(ContextCompat.getColor(this,R.color.light_blue));
            inner.setBackgroundColor(ContextCompat.getColor(this,R.color.light_blue));
        }else if(health<=5 && health>0){
            outer.setBackgroundColor(ContextCompat.getColor(this,R.color.red));
            inner.setBackgroundColor(ContextCompat.getColor(this,R.color.red));
            btn_sneeze.setEnabled(true);
        }else if(health==0){
            Log.d("message","Health is empty, please take medication");
            health=0;
            btn_sneeze.setEnabled(false);
        }else{
            outer.setBackgroundColor(ContextCompat.getColor(this,R.color.white));
            inner.setBackgroundColor(ContextCompat.getColor(this,R.color.white));
        }
    }
    private void printHealth(){
        Log.d("health",String.valueOf(health));
    }
    private void health(){
        printHealth();
        checkHealth();
    }
}
```

Android Manifest XML

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.task1">

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/AppTheme">
        <activity android:name=".MainActivity"
            android:configChanges="orientation|screenSize">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

</manifest>
```

Task 2

String externalization separates string values from its implementation and uses a reference of the string value in the implementation. This assists in localization as you do not need to rebuild the application to accommodate non-English languages and only need to translate the string values in stored in the string file.

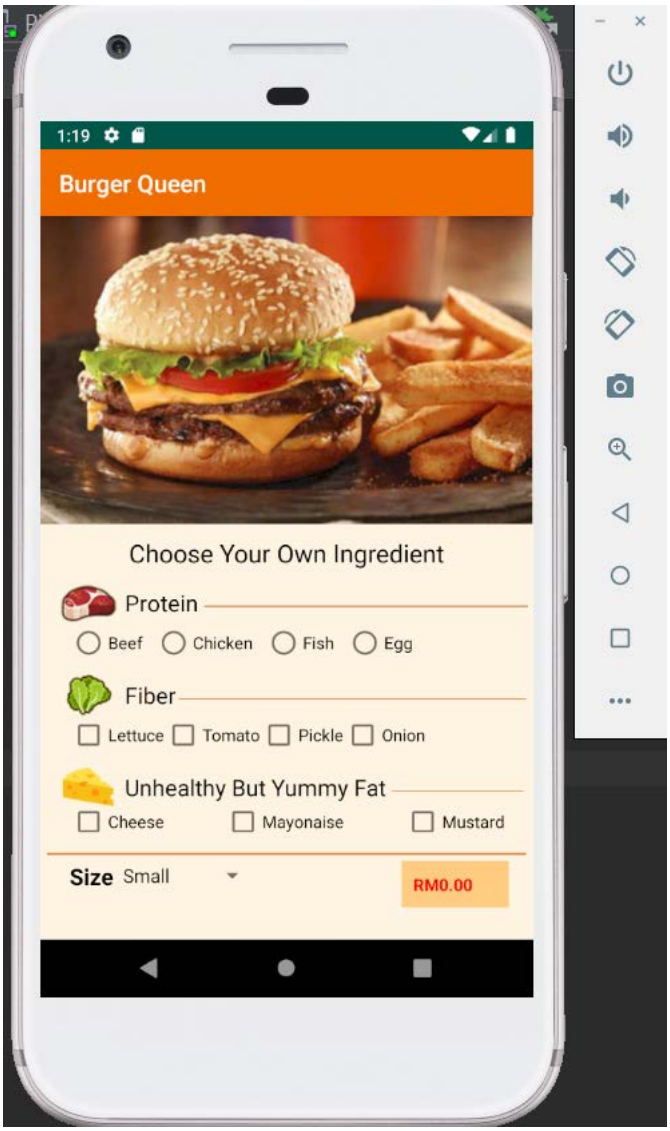


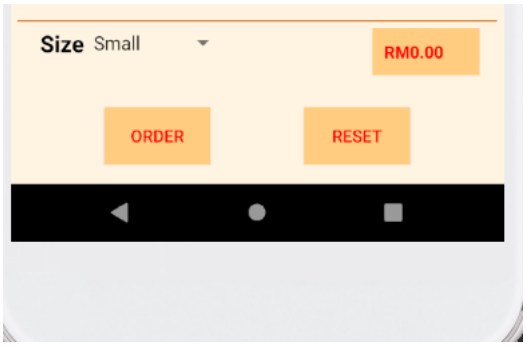
It is seen above that Task 2.2 has been localized to Japanese from English. This is done by switching the Android app's main language from English to Japanese by accessing Settings > System > Languages & input.

Screenshot that the string value is referenced in the layout file

```
<TextView
    android:id="@+id/textView_commons"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="10dp"
    android:text="@string/commons"
    android:textStyle="bold"
    android:textSize="18sp"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
```

Task 3





The Constraint layout as well as Linear layout is used in the structuring of the app's frontend. ScrollView was employed to make the app scrollable because not all UI elements are able to fit the initial screen size. A Toast message is used to display the total price when the Order button is pressed.

For the backend, the initialization of the interactable UI elements were separated into various methods based on UI type. The principle of separation of concern was employed in the various initialization methods, and various support methods created to prevent code redundancy. The only design pattern employed was the Adapter design pattern, or in this

case the ArrayAdapter, which was used to adapt the array of strings to the Spinner UI's dropdown menu. Comments were included to describe the functions and variables used, this takes into consideration code maintainability. Furthermore, a HashMap data structure was used to store the prices of the food items as well as the values to the size of the burger.

Aside from the initialization methods for the various UI elements, various support methods such as check(), updatePrice(), checkSize(), clearCheckBox(), checkSelection(), checkVeg(), vegChecked() and vegUnchecked() were created for code reusability. Below is a list of each of the mentioned methods functions:

- check() – used to check what type of meat is chosen and the price of the meat to be added to the total price.
- updatePrice() – update the TextView of the total price.
- checkSize() – used to check the size chosen for the burger and multiply the total price by the type of size chosen.
- clearCheckBox() – used to clear the checkboxes when the reset button is pressed.
- checkSelection() – check if three vegetables were selected, if true, mute the unselected checkbox, or unmute it when the selection of vegetables drops to 2.
- checkVeg() – check the number of vegetables chosen and apply the promotion if the number of vegetables chosen is 3.
- vegChecked() – adds the price of the vegetable to the total price, decreases the value for selection, increases the value of numOfVeg, calls the checkSelection method and checkVeg method.
- vegUnchecked() – decreases the price of the vegetable from the total price, increases the value for the selection, decreases the value of numOfVeg, calls the checkSelection method, and calls the checkVeg method.

Code

```
package com.example.burgerqueen;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.provider.MediaStore;
import android.util.Log;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.CheckBox;
import android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.Spinner;
import android.widget.TextView;
import android.widget.Toast;

import java.lang.reflect.Array;
import java.util.ArrayList;
import java.util.HashMap;

public class MainActivity extends AppCompatActivity{
```

```
    //Spinner fields and related variables
    private Spinner spinner;
    private ArrayAdapter<String> adapter;
    String[] size;
    static String sizeDefault="Small";

    //Button UI variables
    private Button order,reset;
    private RadioGroup radio_group;
    private RadioButton radiobutton;

    //Total price variables
    private TextView price;
    static double initialPrice=0.00;

    //Meat section variables
    static Boolean isMeatPicked=false;
    static double meat_price; //used to change back total price if meat is unpicked
    // and apply new price for new meat selected
    static Boolean isProteinPicked=false; //check if meat section is selection, it is required

    //Vegetable section variables
    //static String[]
checkBox_ID={"lettuce","tomato","pickle","onion","cheese","mayo","mustard"};
    static String[] checkBox_fiber_ID;
    static String[] checkBox_junk_ID;
    //static CheckBox[] checkBoxes=new CheckBox[checkBox_ID.length];
    static CheckBox[] checkBoxes_fiber;
    static CheckBox[] checkBoxes_junk;
    static int selection=3;
    static int numOfVeg=0;
    static boolean vegPromo=false;/*vegPromo is used to check if promo is hit*/

    //Hashmaps
    private HashMap<String,Double> meat;
    private HashMap<String,Double> fiber;
    private HashMap<String,Double> junk;
    private HashMap<String,Double> sizeHash;

    public MainActivity() {
    }

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        //Call initMain to initialize all UI elements
        initMain();
    }
    private void initMain(){
        //Initialization individual UI elements and systems of the program.
```

```
        initPrice();
        initSpinner();
        initRadioGroup();
        initCheckBox();
        initButton();
    }
    private void initPrice(){
        price=findViewById(R.id.total);
        price.setText(String.format("RM%.2f",initialPrice));

        //HashMap Meat
        meat=new HashMap<>();
        meat.put("Beef",4.50);
        meat.put("Fish",4.00);
        meat.put("Chicken",3.00);
        meat.put("Egg",2.00);

        //HashMap Fiber
        fiber=new HashMap<>();
        fiber.put("Veg",0.50);

        //HashMap Junk
        junk=new HashMap<>();
        junk.put("Cheese",1.00);
        junk.put("Mayonaise",0.50);
        junk.put("Mustard",0.70);

        //HashMap Size
        sizeHash=new HashMap<>();
        sizeHash.put("Regular",1.2);
        sizeHash.put("Small",1.0);
        sizeHash.put("Large",1.3);
        sizeHash.put("Gigantic",1.5);



    }
    private void initButton(){
        order=findViewById(R.id.order);
        reset=findViewById(R.id.reset);

        //ClickListener
        order.setOnClickListener(new View.OnClickListener(){
            @Override
            public void onClick(View view) {
                if(!isProteinPicked){
                    Toast.makeText(MainActivity.this,"Please select a
meat",Toast.LENGTH_SHORT).show();
                }
                else{
                    Toast.makeText(MainActivity.this,"Your total is
```

```
"+String.format("RM%.2f",initialPrice), Toast.LENGTH_SHORT).show();
                }
            }
        });
        reset.setOnClickListener(new View.OnClickListener(){
            @Override
            public void onClick(View view) {
                //Reset radio_group
                radio_group.setOnCheckedChangeListener(null);
                radio_group.clearCheck();
                isMeatPicked=false;
                meat_price=0.00;
                isProteinPicked=false;

                //Reset price
                initialPrice=0.00;
                updatePrice();

                //Reset vegetable section
                selection=3;
                vegPromo=false;
                clearCheckBox();

                //Reset spinner
                sizeDefault="Small";
                spinner.setSelection(0);
                spinner.setClickable(true);
                spinner.setEnabled(true);
                numOfVeg=0;

                //Reinitialize
                initMain();
            }
        });
    }



    private void initCheckBox(){
        //initialize fiber and junk checkbox arrays(testing)
        checkBox_fiber_ID=getResources().getStringArray(R.array.fiber);
        checkBox_junk_ID=getResources().getStringArray(R.array.junk);
        checkBoxes_fiber=new CheckBox[checkBox_fiber_ID.length];
        checkBoxes_junk=new CheckBox[checkBox_junk_ID.length];
        for(int i=0;i<checkBox_fiber_ID.length;i++){
            int temp=getResources().getIdentifier(checkBox_fiber_ID[i],"id",getPackageName());
            checkBoxes_fiber[i]=findViewById(temp);
            checkBoxes_fiber[i].setOnClickListener(new View.OnClickListener(){
                @Override
                public void onClick(View v) {
                    if(((CheckBox) v).isChecked()){
```

```
                vegChecked();
            }else{
                vegUnchecked();
            }
        }
    });
}
for(int i=0;i<checkBox_junk_ID.length;i++){
    int temp=getResources().getIdentifier(checkBox_junk_ID[i],"id",getPackageName());
    checkBoxes_junk[i]=findViewById(temp);
    checkBoxes_junk[i].setOnClickListener(new View.OnClickListener(){
        @Override
        public void onClick(View v) {
            if(((CheckBox)v).isChecked()){
                Double temp=junk.get(((CheckBox) v).getText().toString());
                if(temp!=null){
                    initialPrice+=temp;
                    updatePrice();
                }

            }else{
                Double temp=junk.get(((CheckBox) v).getText().toString());
                if(temp!=null){
                    initialPrice-=temp;
                    updatePrice();
                }
            }
        }
    });
}
}
private void initRadioGroup(){
    radio_group=findViewById(R.id.meat_rg);
    radio_group.setOnCheckedChangeListener(new
RadioGroup.OnCheckedChangeListener() {
        @Override
        public void onCheckedChanged(RadioGroup radioGroup, int i) {
            isProteinPicked=true;
            int id=radio_group.getCheckedRadioButtonId();
            radiobutton=findViewById(id);
            String result=radiobutton.getText().toString();
            //check() is used to check for the meat selected and apply the price
            // or detract the price accordingly
            check(result);
            //isMeatPicked is to confirm that selection has been done before, this is to allow
reselection
            isMeatPicked=true;
        }
    });

}
```

```
private void initSpinner(){
    size=getResources().getStringArray(R.array.sizes);
    spinner=findViewById(R.id.spinner);
    adapter=new ArrayAdapter<String>(this,android.R.layout.simple_spinner_item,size);
    adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
    spinner.setAdapter(adapter);
    spinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {
        @Override
        public void onItemSelected(AdapterView<?> adapterView, View view, int i, long l) {
            sizeDefault=spinner.getSelectedItem().toString();
            //checkSize() is used to check the size selected and apply
            // the appropriate percentage of increase to the total price
            checkSize();
        }

        @Override
        public void onNothingSelected(AdapterView<?> adapterView) {
            //if nothing is selected, this is too ensure that the default size is "Small"
            sizeDefault="Small";
        }
    });

}


private void check(String result){
    //if true, it will subtract meat_price from the initialPrice
    // to revert the totalPrice to 0.00 and apply the new price based on the meat selected.
    if(isMeatPicked){
        initialPrice-=meat_price;
        initialPrice+=meat.get(result);
        meat_price=meat.get(result);
        updatePrice();
    }else {
        //meat_price is used to subtract later on if isMeatPicked is true.
        initialPrice+=meat.get(result);
        meat_price=meat.get(result);
        updatePrice();
    }
}
private void updatePrice(){
    price.setText(String.valueOf(String.format("RM%.2f",initialPrice)));
}

private void checkSize(){
    //checks for the size selected, and apply the correct percentage for price increase.
    for(int i=0;i<size.length;i++){
        if(sizeDefault.equals("Small")){
            continue;
        }else{
            initialPrice*=sizeHash.get(sizeDefault);
```

```
            spinner.setClickable(false);
            spinner.setEnabled(false);
            updatePrice();
            break;
        }
    }

}
private void clearCheckBox(){
    for(int i=0;i<checkBoxes_fiber.length;i++){
        checkBoxes_fiber[i].setChecked(false);
        checkBoxes_fiber[i].setClickable(true);
        checkBoxes_fiber[i].setEnabled(true);
    }
    for(int i=0;i<checkBoxes_junk.length;i++){
        checkBoxes_junk[i].setChecked(false);
        checkBoxes_junk[i].setClickable(true);
        checkBoxes_junk[i].setEnabled(true);
    }
}

private void checkSelection(){
    for(int i=0;i<checkBoxes_fiber.length;i++){
        if(selection==0){
            if(!checkBoxes_fiber[i].isChecked()){
                checkBoxes_fiber[i].setClickable(false);
                checkBoxes_fiber[i].setEnabled(false);
            }
        }else{
            checkBoxes_fiber[i].setEnabled(true);
            checkBoxes_fiber[i].setClickable(true);
        }
    }
}

private void checkVeg(){
    if(numOfVeg==3){
        vegPromo=true;
        initialPrice-=0.50;
        updatePrice();
    }
    else{
        if(vegPromo){
            initialPrice+=0.50;
            vegPromo=false;
            updatePrice();
        }
    }
}
private void vegChecked(){
    initialPrice+=fiber.get("Veg");
```

```
        updatePrice();
        selection--;
        numOfVeg++;
        checkSelection();
        checkVeg();
    }
    private void vegUnchecked(){
        initialPrice-=fiber.get("Veg");
        updatePrice();
        selection++;
        numOfVeg--;
        checkSelection();
        checkVeg();
    }
}
```