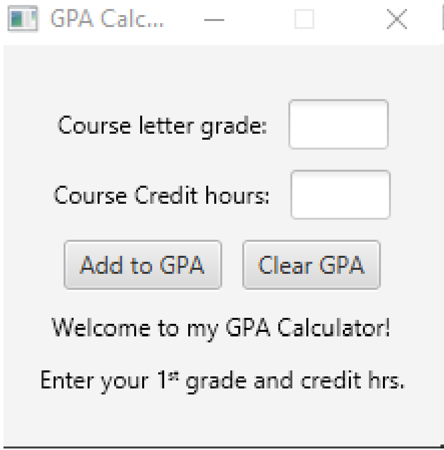
Isaac Ray Shoebottom
CS 1073 (FR02A)
Assignment 9
3429069

Section A

Source Code (GPACalculator):

```
import javafx.application.Application;
import javafx.event.ActionEvent;
import javafx.geometry.Insets;
import javafx.geometry.Pos;
import javafx.scene.Scene;
import javafx.scene.control.Button;
import javafx.scene.control.TextField;
import javafx.scene.layout.FlowPane;
import javafx.scene.text.Text;
import javafx.stage.Stage;

import java.text.DecimalFormat;

public class GPACalculator extends Application {
    FlowPane flowPane = new FlowPane();
    Text textPointsForCourse = new Text("Welcome to my GPA
Calculator!");
    Text textCumulativeGPA = new Text("Enter your 1st grade and credit
hrs.");
    TextField textFieldCLG = new TextField("");
    TextField textFieldCCH = new TextField("");
    Text textCLG = new Text("Course letter grade:");
    Text textCCH = new Text("Course Credit hours:");
    Button buttonAddGPA = new Button("Add to GPA");
    Button buttonClearGPA = new Button("Clear GPA");
    double GPA;
    double totalCreditHours;
    double totalGradePoints;
    public static void main(String[] args) {
        launch(args);
    }
    @Override
    public void start(Stage primaryStage) {
        primaryStage.setTitle("GPA Calculator");
        flowPane.setPadding(new Insets(10, 10, 10, 10));
        flowPane.setHgap(10);
        flowPane.setVgap(10);
        flowPane.setAlignment(Pos.CENTER);

        buttonAddGPA.setOnAction(this::AddGPA);
        buttonClearGPA.setOnAction(this::ClearGPA);

        textFieldCCH.setPrefWidth(50);
        textFieldCCH.setOnAction(this::AddGPA);
        textFieldCLG.setPrefWidth(50);
        textFieldCLG.setOnAction(actionEvent ->
textFieldCCH.requestFocus());

        flowPane.getChildren().addAll(
                textCLG, textFieldCLG,
                textCCH, textFieldCCH,
                buttonAddGPA, buttonClearGPA,
                textPointsForCourse,
                textCumulativeGPA);

        primaryStage.setScene(new Scene(flowPane, 210, 190));
        primaryStage.setResizable(false);
        primaryStage.show();
    }
    private void ClearGPA(ActionEvent actionEvent) {
        textCumulativeGPA.setText("Enter your 1st grade and credit
hrs.");
        textPointsForCourse.setText("Totals have been reset");
        textFieldCCH.setText("");
        textFieldCLG.setText("");
        totalCreditHours = 0;
        totalGradePoints= 0;
        GPA = 0;
    }
    private void AddGPA(ActionEvent actionEvent) {
        double creditHours =
Double.parseDouble(textFieldCCH.getText());
        double gradePoints = 0;
        String letterGrade = textFieldCLG.getText();
        switch (letterGrade.toUpperCase()) {
            case "A+":
                gradePoints = 4.3*creditHours; break;
            case "A":
                gradePoints = 4.0*creditHours; break;
            case "A-":
                gradePoints = 3.7*creditHours; break;
            case "B+":
                gradePoints = 3.3*creditHours; break;
            case "B":
                gradePoints = 3.0*creditHours; break;
            case "B-":
                gradePoints = 2.7*creditHours; break;
            case "C+":
                gradePoints = 2.3*creditHours; break;
            case "C":
                gradePoints = 2.0*creditHours; break;
            case "D":
                gradePoints = 1.0*creditHours; break;
            case "F":
            case "WF":
                gradePoints = 0.0; break;
            default:
                textPointsForCourse.setText("Invalid Grade - GPA not
changed");
        }

        DecimalFormat df = new DecimalFormat("#.0");
        textPointsForCourse.setText("Points for this course: " +
df.format(gradePoints));
        totalCreditHours = totalCreditHours +
Double.parseDouble(textFieldCCH.getText());
        totalGradePoints = totalGradePoints + gradePoints;
        GPA = totalGradePoints/totalCreditHours;
        textCumulativeGPA.setText("Your cumulative GPA is: " +
df.format(GPA));
    }
```

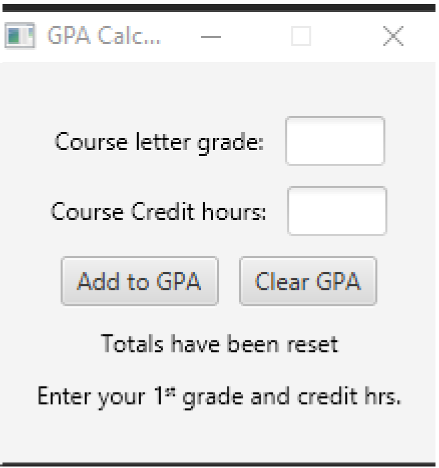


Course letter grade:

Course Credit hours:

Welcome to my GPA Calculator!

Enter your 1st grade and credit hrs.



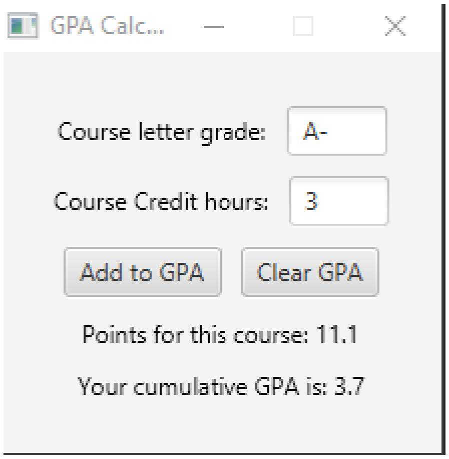
Course letter grade:

Course Credit hours:

Totals have been reset

Enter your 1st grade and credit hrs.

}

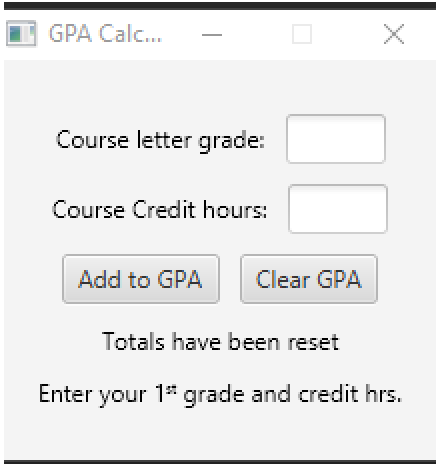


Course letter grade: A-

Course Credit hours: 3

Points for this course: 11.1

Your cumulative GPA is: 3.7



Course letter grade:

Course Credit hours:

Totals have been reset

Enter your 1st grade and credit hrs.

Section B

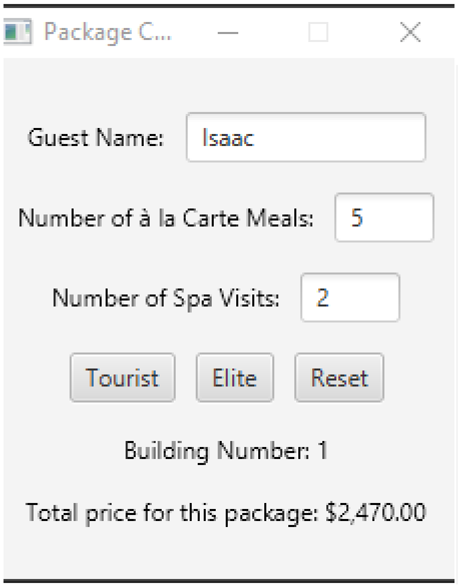
3 classes

```
import java.text.DecimalFormat;
import java.text.NumberFormat;
import java.util.Locale;

public class ResortBooking {
    String name;
    TouristPackageBooking tTourist;
    ElitePackageBooking eTourist;
    NumberFormat cf = NumberFormat.getCurrencyInstance(Locale.CANADA);

    ResortBooking(TouristPackageBooking touristIn, String name) {
        tTourist = touristIn;
        this.name = name;
    }
    ResortBooking(ElitePackageBooking touristIn, String name) {
        eTourist = touristIn;
        this.name = name;
    }

    String getBuildingNumber(TouristPackageBooking tourist) {
        return "Building Number: " + tourist.getBuildingNumber();
    }
    String getBuildingNumber(ElitePackageBooking tourist) {
        return "Building Number: " + tourist.getBuildingNumber();
    }

    String getTotalCost(TouristPackageBooking tourist) {
        return "Total price for this package: " + cf.format(tourist.getTotalCost());
    }
    String getTotalCost(ElitePackageBooking tourist) {
        return "Total price for this package: " + cf.format(tourist.getTotalCost());
    }
}
```

```
public class TouristPackageBooking {
    final double basePrice = 1475.00;
    long aLaCarteMeals;
    long spaVisits;

    TouristPackageBooking(long aLaCarteMeals, long spaVisits) {
        this.aLaCarteMeals = aLaCarteMeals;
        this.spaVisits = spaVisits;
    }
    double getTotalCost() {
        double spaVisitCosts = 0;
        if (spaVisits == 1) {
            spaVisitCosts = 125.00;
        }
        else if (spaVisits > 1) {
            spaVisitCosts = 125 + ((spaVisits - 1) * 100);
        }
        return (basePrice + (aLaCarteMeals*35.00) + spaVisitCosts);
    }
    int getBuildingNumber() {
        return (int)((Math.random() * (5-2) + 2));
    }
}
```

```java
public class ElitePackageBooking extends  TouristPackageBooking{

    ElitePackageBooking(long aLaCarteMeals, long spaVisits) {
        super(aLaCarteMeals, spaVisits);
    }

    @Override
    double getTotalCost() {
        double aLaCarteMealsCost;
        if (aLaCarteMeals <= 3) {
            aLaCarteMealsCost = 0.00;
        }
        else {
            aLaCarteMealsCost = (aLaCarteMeals -3) * 35.00;
        }
        return ((super.basePrice+775) + (aLaCarteMealsCost) + (spaVisits*75));
    }

    @Override
    int getBuildingNumber() {
        return 1;
    }
}
```

Output



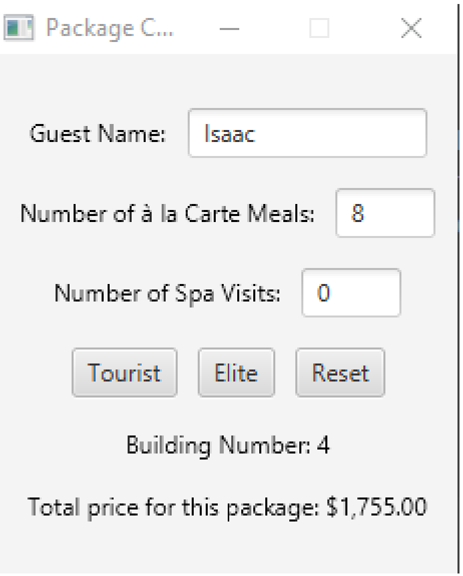
Guest Name: Isaac

Number of à la Carte Meals: 5

Number of Spa Visits: 2

Building Number: 1

Total price for this package: $2,470.00



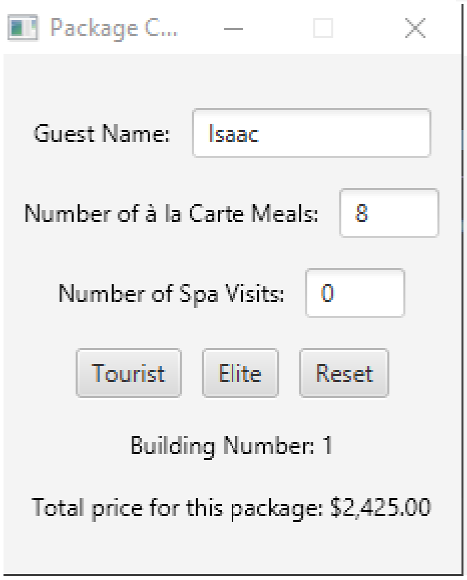
Guest Name: Isaac

Number of à la Carte Meals: 8

Number of Spa Visits: 0

Building Number: 4

Total price for this package: $1,755.00



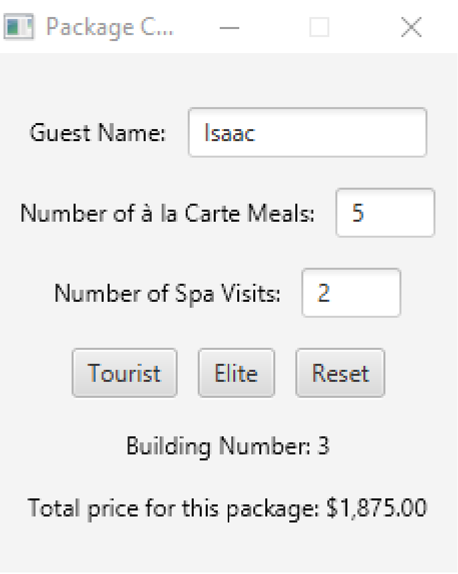
Guest Name: Isaac

Number of à la Carte Meals: 8

Number of Spa Visits: 0

Building Number: 1

Total price for this package: $2,425.00



Guest Name: Isaac

Number of à la Carte Meals: 5

Number of Spa Visits: 2

Building Number: 3

Total price for this package: $1,875.00

Section C

Gui

```
import javafx.application.Application;

import javafx.event.ActionEvent;

import javafx.geometry.Insets;

import javafx.geometry.Pos;

import javafx.scene.Scene;

import javafx.scene.control.Button;

import javafx.scene.control.TextField;

import javafx.scene.layout.FlowPane;

import javafx.scene.text.Text;

import javafx.stage.Stage;


public class GUIFrontEnd extends Application {

    FlowPane flowPane = new FlowPane();

    Text textBuildingNumber = new Text("Welcome to Paradise Palms!");

    Text textTotalCost = new Text("Enter your booking information.");

    TextField textFieldName = new TextField("");

    TextField textFieldALCM = new TextField("");

    TextField textFieldNSV = new TextField("");

    Text textName = new Text("Guest Name:");

    Text textALCM = new Text("Number of \u00E0 la Carte Meals:");

    Text textNSV = new Text("Number of Spa Visits:");

    Button buttonTourist = new Button("Tourist");

    Button buttonElite = new Button("Elite");

    Button buttonReset = new Button("Reset");


    public static void main(String[] args) {

        launch(args);
    }
    @Override
    public void start(Stage primaryStage) {
        primaryStage.setTitle("Package Calculator");
        flowPane.setPadding(new Insets(10, 10, 10, 10));
        flowPane.setHgap(10);
        flowPane.setVgap(15);
        flowPane.setAlignment(Pos.CENTER);

        buttonElite.setOnAction(this::calculateElite);
        buttonTourist.setOnAction(this::calculateTourist);
        buttonReset.setOnAction(this::reset);

        textFieldName.setPrefWidth(120);
        textFieldALCM.setPrefWidth(50);
        textFieldNSV.setPrefWidth(50);

        flowPane.getChildren().addAll(
            textName, textFieldName,
            textALCM, textFieldALCM,
            textNSV, textFieldNSV,
            buttonTourist, buttonElite, buttonReset,
            textBuildingNumber,
            textTotalCost);

        primaryStage.setScene(new Scene(flowPane, 220, 250));
        primaryStage.setResizable(false);
        primaryStage.show();
    }
```

```
    private void calculateElite(ActionEvent actionEvent) {
        ElitePackageBooking tourist = new ElitePackageBooking(Long.parseLong(textFieldALCM.getText()),
Long.parseLong(textFieldNSV.getText()));
        ResortBooking resort = new ResortBooking(tourist, textFieldName.getText());
        textBuildingNumber.setText(resort.getBuildingNumber(tourist));
        textTotalCost.setText(resort.getTotalCost(tourist));

    }
    private void calculateTourist(ActionEvent actionEvent) {
        TouristPackageBooking tourist = new
TouristPackageBooking(Long.parseLong(textFieldALCM.getText()),
Long.parseLong(textFieldNSV.getText()));
        ResortBooking resort = new ResortBooking(tourist, textFieldName.getText());
        textBuildingNumber.setText(resort.getBuildingNumber(tourist));
        textTotalCost.setText(resort.getTotalCost(tourist));
    }
    private void reset(ActionEvent actionEvent) {
        textFieldName.setText("");
        textFieldALCM.setText("");
        textFieldNSV.setText("");
        textBuildingNumber.setText("Welcome to Paradise Palms!");
        textTotalCost.setText("Enter your booking information.");
    }
}
```