Isaac Ray Shoebottom
CS 1073 (FR02A)
Assignment 10
3429069

Section A

Source Code (Converter):

```
/**
 * Class containing the methods for conversion
 * @author Isaac Shoebottom (3429069)
 */

public class Converter {

    /**
     * Convert hexadecimal to base 10
     * @param hex String containing the hex digits
     * @return returns the decimal value
     */
    static long hex2Decimal(String hex) {
        String hexChars = "0123456789ABCDEF";
        hex = hex.toUpperCase();
        long decimal = 0;
        int intermediaryValue;
        char index;
        for (int i = hex.length(), p = 0; i != 0; i--, p++) {
            index = hex.charAt(i-1);
            intermediaryValue = hexChars.indexOf(index);
            if (intermediaryValue == -1)
                return -1;
            decimal = decimal + intermediaryValue*(int)(Math.pow(16,
p));
        }
        return decimal;
    }
```

```
/**
 * Converts the english text to the encoded text
 * @param english String containing standard english
 * @return Returns encoded text
 */
static String english2Encrypted(String english) {
    english = english.toUpperCase();
    if (english.length() > 1) {
        english = swapFirstAndLastLettersInString(english);
    }

    for (int i = 0; i < english.length(); i++) {
        char index = english.charAt(i);
        switch (index) {
            case 'E':
                english = replaceInString(english, i, "A");
                break;
            case 'A':
                english = replaceInString(english, i, "E");
                break;
            case 'O':
                english = replaceInString(english, i, "I");
                break;
            case 'I':
                english = replaceInString(english, i, "O");
                break;
            case 'U':
                english = replaceInString(english, i, "Y");
                break;
            case 'Y':
```

```
                    english = replaceInString(english, i, "U");
                    break;
                }
            }
            return english;
        }

        /**
         * Replace a letter in a string
         * @param str String to be modified
         * @param index The character's index to be replaced
         * @param replace The string that will be replacing the character
         * @return The string with the string replaced
         */
        private static String replaceInString(String str, int index,
String replace){
            return str.substring(0, index) + replace +
str.substring(index+1);
        }

        /**
         * Swaps the first and letters in every word in a string
         * @param str The string to be swapped
         * @return The string with letters swapped
         */
        private static String swapFirstAndLastLettersInString(String str)
{
            StringBuilder output = new StringBuilder();
            String[] splitStr = str.trim().split("\\s+");

            for(int i = 0; i < splitStr.length; i++) {
```

```
            if (splitStr[i].length() != 1) {
                splitStr[i] =
swapFirstAndLastLetterFromWord(splitStr[i]);
            }

            output.append(" ").append(splitStr[i]);
            if (i == 0) {
                output = new StringBuilder(splitStr[i]);
            }

        }

        return output.toString();
    }

    /**
     * Method to swap the first and last letters in a word
     * @param str The string to be swapped
     * @return The swapped string
     */
    private static String swapFirstAndLastLetterFromWord(String str) {
        return str.charAt(str.length() - 1) + str.substring(1,
str.length() - 1) + str.charAt(0);
    }
}
```

Source Code (Driver):

```
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;

/**
 * GUI Class
 * @author Isaac Shoebottom (3429069)
 */

public class Driver extends Application {
    FlowPane flowPane = new FlowPane();
    Text textInstructions = new Text("Enter a hex value or English
word or phrase:");
    TextField textFieldMain = new TextField("");
    Button buttonH2D= new Button("Hex To Decimal");
    Button buttonE2E = new Button("English to Encrypted");
    Text textResult = new Text("Welcome to the Converter App!");

    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);

    buttonH2D.setOnAction(this::calculateHex);
    buttonE2E.setOnAction(this::calculateEncrypted);

    textFieldMain.setPrefWidth(150);

    flowPane.getChildren().addAll(
            textInstructions,
            textFieldMain,
            buttonH2D, buttonE2E,
            textResult
            );

    primaryStage.setScene(new Scene(flowPane, 250, 200));
    primaryStage.setResizable(false);
    primaryStage.show();
}

private void calculateHex(ActionEvent actionEvent) {
    long input = Converter.hex2Decimal(textFieldMain.getText());
    if (input == -1) {
        textResult.setText("Invalid input");
    }
    else {
        textResult.setText(Long.toString(input));
```

```
        }
    }
    private void calculateEncrypted(ActionEvent actionEvent) {

textResult.setText(Converter.english2Encrypted(textFieldMain.getText()
));
    }
}
```

Section B

Photos