

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Information and Computer Science Department

Summer Semester 163

ICS 201 - Introduction to Computing II

Final Exam

Tuesday, August 22, 2017

Duration: 120 minutes

Name:

ID#:

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Question #	Max Score	Score
1	35	
2	35	
3	35	
Total	100	

**Question # 1**

Write a GUI fraction simplifier in which the user enters a fraction to simplify it.

```

import javafx.application.*;
import javafx.geometry.Pos;
import javafx.scene.control.*;
import javafx.scene.layout.*;
import javafx.stage.*;
import javafx.scene.*;

public class Q1 extends Application {
    public static void main(String args[]) {
        Launch(args);
    }

    public void start(Stage Stage) {
        Label lbl = new Label("Enter the fraction to Simplfy");
        TextField tx = new TextField();
        Button btn = new Button("Simplfy");
        Button btn2 = new Button("Clear");
        Stage.setTitle("fractionSimplfier");
        Stage.setMinHeight(250);
        Stage.setMinWidth(500);
        VBox r = new VBox(10);
        r.getChildren().addAll(lbl, tx, btn, btn2);
        r.setAlignment(Pos.CENTER);
        Scene s = new Scene(r);
        Stage.setScene(s);
        Stage.show();
        btn.setOnAction(e -> {
            String f = tx.getText().trim();
            int indx = f.indexOf("/");
            int d = 0, n = -1;
            if (indx > 0 && indx < f.length() - 1) {
                d = Integer.parseInt(f.substring(0, indx));
                n = Integer.parseInt(f.substring(indx + 1));
            }
            if ((n > 0) && indx > 0 && indx < f.length() - 1) {
                for (int i = d; i > 0; i--) {
                    if ((d % i == 0) && (n % i == 0)) {
                        d /= i;
                        n /= i;
                    }
                }
                if (n == 1)
                    tx.setText(String.format("%d", d));
                else
                    tx.setText(String.format("%d/%d", d, n));
            } else if (indx > 0 && indx < f.length() - 1)
                tx.setText("The numrator should not be zero!!!");
            else
                tx.setText("The fraction should not be like that!!!");
        });
        btn2.setOnAction(e -> tx.setText(null));
    }
}

```

**Question # 2**

Write a method that takes a linked list of courses as a parameter and removes the duplicates using iterators/  
list iterators only.

```
import java.util.*;
```

```
public class Q2 {
    public static void main(String[] args) {
        LinkedList<String> courses = new LinkedList<>();
        for (int i = 0; i < 10; i++) {
            courses.add(String.format("ICS20%d", i));
        }

        for (int i = 4; i < 6; i++) {
            courses.add(String.format("ICS20%d", i));
        }
        for (int i = 0; i < 3; i++) {
            courses.add(String.format("ICS20%d", i));
        }
        System.out.println("courses before removeing the duplicate");
        for (String c : courses)
            System.out.println(c);
        duplicated2(courses);
        System.out.println("courses after removeing the duplicate");
        for (String c : courses)
            System.out.println(c);
    }

    public static void duplicated(LinkedList<String> c) {
        Iterator<String> it = c.iterator();
        int r = 1;
        while (it.hasNext()) {
            String s = it.next();
            for (int i = r; i < c.size(); i++) {
                if (s.equals(c.get(i)))
                    it.remove();
            }
            r++;
        }
    }

    public static void duplicated2(LinkedList<String> c) {
        LinkedList<String> s = new LinkedList<>();
        for (int i = 0; i < c.size(); i++) {
            if (!(s.contains(c.get(i)))) {
                s.add(c.get(i));
            }
        }
        c.clear();
        c.addAll(s);
    }
}
```

**Question # 3**

Write a program that displays four images in a cycle. The image will change every second.

```
import javafx.application.*;
import javafx.scene.*;
import javafx.scene.image.*;
import javafx.scene.layout.*;
import javafx.stage.*;

public class Q3 extends Application {
    public ImageView image;

    public static void main(String[] args) {
        Launch(args);
    }

    public void start(Stage stg) {
        image = new ImageView();
        cycle();
        HBox root = new HBox();
        root.getChildren().add(image);
        Scene scene = new Scene(root);
        stg.setScene(scene);
        stg.show();
    }

    public void cycle() {
        Thread t = new Thread(new Runnable() {
            public void run() {
                try {
                    while (true) {
                        image.setImage(new Image("0.jpg"));
                        Thread.sleep(1000);
                        image.setImage(new Image("1.jpg"));
                        Thread.sleep(1000);
                        image.setImage(new Image("2.jpg"));
                        Thread.sleep(1000);
                        image.setImage(new Image("3.jpg"));
                    }
                } catch (Exception e) {
                }
            }
        });
        t.start();
    }
}
```