

Family Name: .....

Other Names: .....

ID Number: .....

Signature .....

## Model Solutions

### COMP 102: Test 2

21, September, 2012

#### Instructions

- Time allowed: **45 minutes**
- There are 45 marks in total.
- Answer **all** the questions.
- Write your answers in the boxes in this test paper and hand in all sheets. You may ask for additional paper if you need it.
- If you think some question is unclear, ask for clarification.
- Brief Java documentation will be supplied with the test.
- This test will contribute 15% of your final grade,  
(But your mark will be boosted up to your exam mark if that is higher.)
- Only silent non-programmable calculators or silent programmable calculators with their memories cleared are permitted in this examination.
- Non-electronic foreign language translation dictionaries may be used.
- You may write notes and working on this paper, but make sure it is clear where your answers are.

#### Questions

#### Marks

1. Understanding Java

[17]

2. Event Driven Input

[10]

3. Defining Classes

[10]

4. File Processing

[8]

TOTAL:

**SPARE PAGE FOR EXTRA ANSWERS**

Cross out rough working that you do not want marked.  
Specify the question number for work that you do want marked.

## Question 1. Understanding Java

[17 marks]

(a) [4 marks] Consider the following counting method:

```
public void counting(int num){  
    int ans = 1;  
    int n = 1;  
    while ( n <= num ){  
        ans = ans + n;  
        Ul.println (ans);  
        n = n + 2;  
    }  
    Ul.println (n);  
}
```

What will be printed if counting(10) is called?

```
2  
5  
10  
17  
26  
11
```

(b) [3 marks] Consider the following choose method:

```
public void choose(int a, int b, int c){  
    Ul. printf ("choose %d, %d, %d ", a, b, c);  
    if (a < b)           { Ul. println ("Monday"); }  
    else if (b < c)      { Ul. println ("Tuesday"); }  
    else if (c == b || a == c) { Ul. println ("Wednesday"); }  
    else                 { Ul. println ("Sunday"); }  
}
```

What will be printed if choose(4, 3, 2) is called?

Sunday

What will be printed if choose(3, 2, 3) is called?

Tuesday

What will be printed if choose(2, 4, 4) is called?

Monday

**(Question 1 continued)**

(c) [4 marks] Suppose the file called `SomeText.txt` contains the following:

```
Hello 300 200 everyone
GoodBye 100 600
10 20 30 40 50
```

What will the following `fileExample` method print out?

Hint: keep track of the values of all the variables

```
public void fileExample(){
    try{
        Scanner scan = new Scanner(new File("SomeText.txt"));
        while ( scan.hasNext() ) {
            String token = scan.next();
            UI.println (token);
            int x = scan.nextInt ();
            String y = scan.nextLine();
            UI.println (x);
        }
        scan.close();
    }
    catch(IOException e){UI.println("Fail: " + e);}
}
```

```
Hello
300
GoodBye
100
10
20
```

(Question 1 continued on next page)

**(Question 1 continued)**

**(d)** [6 marks] Consider the Record class on the facing page.

What will the following fragment of code print out? (Note the variables carefully.)

```
Record b1 = new Record("TeamA");
b1.setScore(1);
UI.println(b1.getScore());
Record b2 = new Record("TeamB");
b2.setScore(2);
b1.setScore(5);
b1.print();
UI.println(b2.getScore());
```

```
new Score is: 1
1
new Score is: 2
new Score is: 5
TeamA : 5
2
```

(Question 1 continued on next page)

(Question 1 continued)

```
public class Record{
    // fields
    private String name;
    private int score = 0;

    public Record(String n){
        this.name = n;
    }

    public int getScore(){
        return this.score;
    }

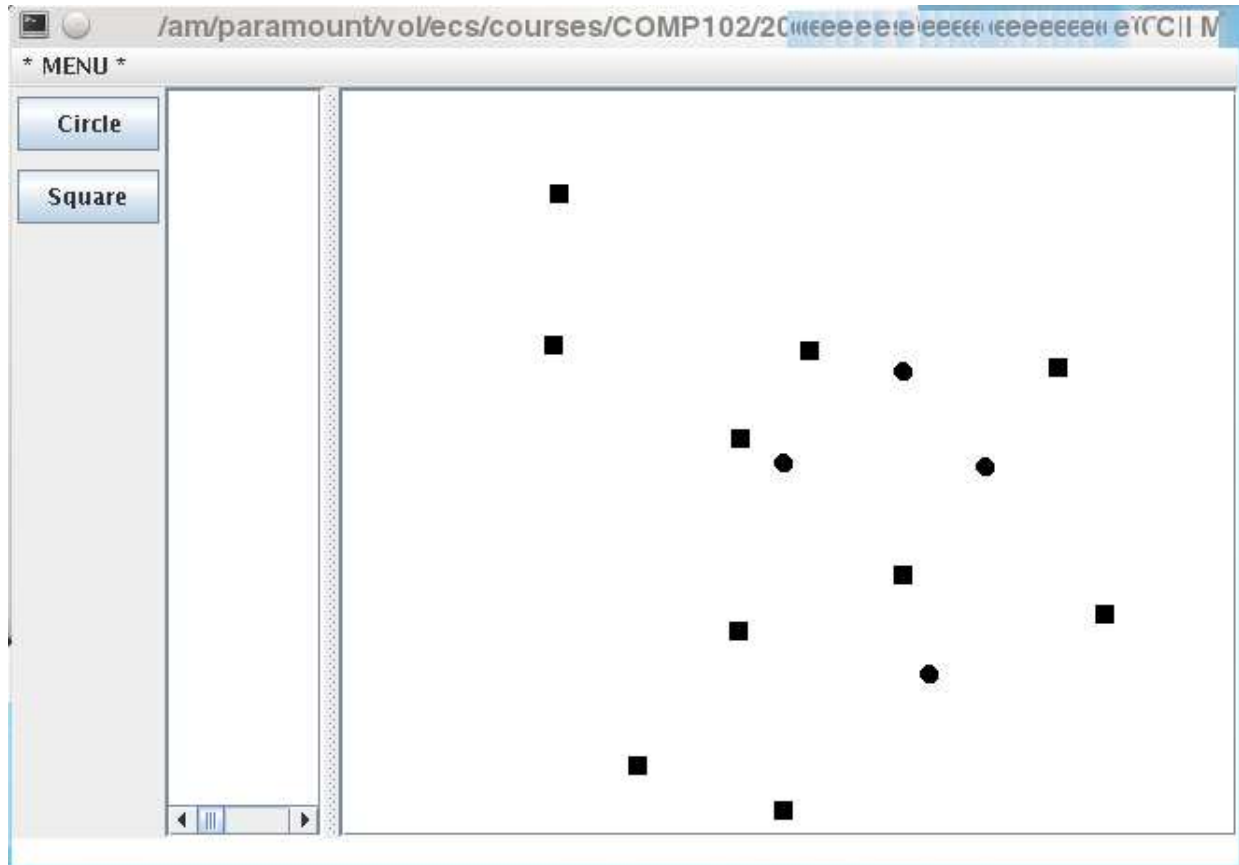
    public void setScore(int m){
        this.score = m;
        Ul.println ("new Score is: " + this.score);
    }

    public void print(){
        Ul.println (this.name + " : " + this.score);
    }
}
```

## Question 2. Event-Driven Input

[10 marks]

The SquareOrCircle program on the facing page should allow the user to draw square or circle shapes on the graphics pane, as shown below. The current program only can draw squares. When the user presses the mouse at one point, then the program draws a little square at the point. Add two buttons to the program (labeled Square and Circle) that allow the user to change the shapes.



(Question 2 continued on next page)



(Question 2 continued)

```
import comp102.*;

public class SquareOrCircle implements UIMouseListener {
    , UIButtonListener

    private String shape = "square";

    public SquareOrCircle(){
        UI.setMouseListener(this);
        UI.addButton("Circle", this);
        UI.addButton("Square", this);

    }
    public void buttonPerformed(String button){
        if (button.equals("Circle")){this.shape = "circle";}
        else if (button.equals("Square")){this.shape = "square";}
    }

    public void mousePerformed(String action, double x, double y) {

        if (action.equals("released")){
            if (this.shape.equals("circle"))
                UI.fillOval (x, y, 10, 10);
            else UI.fillRect (x, y, 10, 10);
        }
    }
}
```

### Question 3. Defining Classes

[10 marks]

For this question, you are to complete part of a program that allows people to open a bank account, deposit and withdraw from the account.

The `BankAccount` class on the facing page represents individual accounts. Each account has an account holder name and a balance.

You are to complete the `BankAccount` class:

- Define two fields to store the name of the account holder and the balance.
- Complete the constructor, which should have one parameter specifying the name. Each account has a zero balance when it is created.
- Complete the `statement` method, which has no parameters. It should print the name and the balance.
- Complete the `deposit` method, which has one parameter specifying the amount. It should update the balance and then print a statement (to show the name and the new balance).
- Complete the `withdraw` method, which should have one parameter—the amount to withdraw from the account. If there is enough money in the account, it should update the balance and print a statement (with name and updated balance). Otherwise, it should just print a message.

As an example of using the `BankAccount` class, the `testBankAccount` method below creates an account, deposits 200 dollars, withdraws 100 dollars and prints a statement.

```
public void testBankAccount(){
    BankAccount b = new BankAccount("Alan");
    b.deposit(200);
    b.withdraw(100);
    b.statement();
}
```

(Question 3 continued)

```
public class BankAccount{
    // Fields

    private String accountHolder;
    private double balance;

    public BankAccount(String name){

        this.accountHolder = name;
        this.balance = 0.0;

    }

    public void statement(){

        UI.printf ("%s has a balance of $%4.2f\n", this.accountHolder, balance);

    }

    public void deposit(double amount){

        this.balance = this.balance + amount;
        this.statement();

    }

    public void withdraw(double amount){

        if ( this.balance >= amount) {
            this.balance = this.balance - amount;
            this.statement();
        }
        else {
            UI.println ("You have insufficient funds to withdraw.");
        }

    }
}
```

#### Question 4. File Processing

[8 marks]

This question is the same as the ExamTimes question in Assignment 5.

Four of the lines of an example file “examdata.txt” are shown here:

```
ACCY111 CO216    19  20 ABD      ALSOP
COMP311 HU324     2   15 ANGELL  DUTTON
COMP311 KK203     2   10 ELLIS   KUMAR
HRIR303 HULT220  20  30 ALLERBY  JIANG
```

The format of the lines is as follows:

- The first token is the course code
- The second token is the exam room
- The third token is the date (the day of the month).
- The fourth token is the number of students in the room.
- The last two tokens specify the range of names of students in that room.

Your task is to complete the `PrintSession` in the `ExamTimes` class on the facing page.

The `printSession` method would be useful for constructing a timetable for the exam administrators to post each exam day. It prints out all the courses that are scheduled for a particular day. It asks the user for a date, and then prints all the exams (course, room, and name ranges) scheduled on that date.

(Question 4 continued on next page)

(Question 4 continued)

```
public void printSession(int targetDate){
    // YOUR CODE HERE
    UI.printf ("\nExams on %d:\n\n", targetDate);
    try{
        Scanner fileScan = new Scanner(new File("examdata.txt"));
        while (fileScan.hasNext()){
            String code = fileScan.next();
            String room = fileScan.next();
            int date = fileScan.nextInt();
            int count = fileScan.nextInt();
            String startName = fileScan.next();
            String endName = fileScan.next();

            if ( date==targetDate ){
                UI.printf ("%s is in %s \t(%s to %s)\n", code, room, startName, endName);
            }
        }
        fileScan.close();

    }catch(IOException e){UI.println("File Failure: " + e);}
}
```

\*\*\*\*\*

**SPARE PAGE FOR EXTRA ANSWERS**

Cross out rough working that you do not want marked.  
Specify the question number for work that you do want marked.