



King Saud University

College of Computer and Information Sciences

Computer Science Department

Course Code:	CSC 111
Course Title:	Introduction to Programming
Semester:	Fall 2012
Exercises Cover Sheet:	Mid 2 Exam

Student Name:

Student ID:

Student Section No.

Tick the Relevant	Computer Science B.Sc. Program ABET Student Outcomes	Question No. Relevant Is Hyperlinked	Covering %
√	a) Apply knowledge of computing and mathematics appropriate to the discipline;	1	33
	b) Analyze a problem, and identify and define the computing requirements appropriate to its solution		
√	c) Design, implement and evaluate a computer-based system, process, component, or program to meet desired needs;	2, 3	67
	d) Function effectively on teams to accomplish a common goal;		
	e) Understanding of professional, ethical, legal, security, and social issues and responsibilities;		
	f) Communicate effectively with a range of audiences;		
	g) Analyze the local and global impact of computing on individuals, organizations and society;		
	h) Recognition of the need for, and an ability to engage in, continuing professional development;		
√	i) Use current techniques, skills, and tools necessary for computing practices.		
	j) Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;		
	k) Apply design and development principles in the construction of software systems of varying complexity;		

Question 1 (10 Marks):

1. What is the value of b after executing the following code? **(2 Marks)**

<pre>i = 8; j = 3; k = 1; b = ((j == 6 && i <= k) (j < 8));</pre>		<pre>i = 8; j = 10; k = 1; b = ((j == 6 && i <= k) (j < 8));</pre>
--	--	---

answer :

true2.00false

2. What is the display of the following code? **(3 Marks)**

```
int result = 0, operator = 2,  
    firstNumber=3,secondNumber=4; | firstNumber=4,secondNumber=3;  
  
switch (operator) {  
    case 1: result = firstNumber / secondNumber ;  
    case 2: result = firstNumber * secondNumber ;  
    case 3: result = firstNumber + secondNumber ;  
    case 4: result = result+(firstNumber - secondNumber) ;  
        break;  
    default: result = 0;  
}  
System.out.println("result = " + result );
```

answer :

result = 63.00result = 8

1. what is the display of the following code? **(2 Marks)**

```
int i = 0;
while (i < 5) {
    if ((i + 3) % 2 == 0) {
        System.out.println("i= "+i);
        i+=3;
    }
    else i+=4;
    i++;
}
System.out.println("I am out of the loop");
```

Answer:

I am out of the loop

..... 2.00

-
2. what is the display of the following code? **(3 Marks)**

```
int i = 1;
int x = 0;
while (x <= 15) {
    x = x * 3+i;
    i+=2 ;
    System.out.println(x + "##");
}
```

Answer:

1 ##

..... 1.00

6 ##

..... 1.00

23 ##

..... 1.00

Question 2 (12 Marks):

Point
-x : int -y : int -color : string
+Point() +Point(in a : int, in b : int) +setPoint(in a : int, in b : int) : void +getX() : int +getY() : int +getColor() : string +movePoint(in dx : int, in dy : int) : void -changeColor() : void

Consider the class **Point** that defines a point with its coordinates (x,y) and its color. The class Point has the following attributes:

- x** : represents the value of the first coordinate
- y** : represents the value of the second coordinate
- color** : represents the color of the point

The class **Point** has the following methods:

A constructor **Point()**: initializes x, y with the value 0 (zero) and the attribute **color** with the value "black".

A constructor **Point(int a, int b)**: initializes x, y with the value a and b and the attribute **color** with the value "black".

setPoint(int a, int b): stores the values of the input parameters in the attributes **x** and **y**.

movePoint(int dx, int dy): move the point from its actual position to a new position where dx and dy represent the shift from the actual position to the new one.

changeColor(): a private method that changes the color of the point according to its coordinates(int, int). changes the color of the point according to the following rules.

x	y	color
<0	<0	red
>=0	<0	green
<0	>=0	blue
>=0	>=0	yellow

Note: **setPoint** and **movePoint** changes the coordinates of the point. Any **changes** of the coordinates of the point changes the color of the point according to the defined table.

Implement the class *Point*.**Answer :**

```
class Point { ..... 0.25
    private int x; ..... 0.25
    private int y; ..... 0.25
    private String color; ..... 0.25

    public Point() {
        x = y = 0; ..... 0.50
        color = "black"; ..... 0.50
    }

    public Point(int a, int b) {
        x = a; ..... 0.25
        y = b; ..... 0.25
        color = "black"; ..... 0.50
    }

    public void setPoint(int a, int b) {
        x = a; ..... 0.50
        y = b; ..... 0.50
        changeColor(); ..... 1.00
    }

    public int getX() {
        return x; ..... 1.00
    }

    public int getY() {
        return y; ..... 1.00
    }

    public String getColor() {
        return color; ..... 1.00
    }

    public void movePoint(int dx, int dy) {
        x += dx; ..... 0.50
        y += dy; ..... 0.50
        changeColor(); ..... 1.00
    }

    public void changeColor() {
        if (x < 0 && y < 0) color = "red"; ..... 0.50
        if (x >=0 && y < 0) color = "green"; ..... 0.50
        if (x < 0 && y >=0) color = "blue"; ..... 0.50
        if (x >=0 && y >=0) color = "yellow"; ..... 0.50
    }
}
```


Question 3 (8 Marks):

Write a Java program that:

- creates 2 points. The first one at the position (-5, 6) and the second one in the origin.
- moves the first point with 2 in the x axis and with 1 in the y axis;
- sets new coordinates to the second point, entered by the user from the keyboard.
- displays the color of the point that has the biggest y.

Answer :

```
import java.util.Scanner; ..... 0.25

class TestPoint { ..... 0.25
    public static void main(String[] args) { ..... 0.25

        Scanner S = new Scanner(System.in); ..... 0.50

        Point p1 = new Point(-5, 6); ..... 1.00

        Point p2 = new Point(); ..... 1.00
        // or Point p2 = new Point(0, 0);

        p1.movePoint(2, 1); ..... 1.00

        int x = S.nextInt(); ..... 0.50
        int y = S.nextInt(); ..... 0.50
        p2.setPoint(x, y); ..... 0.75

        if (p1.getY() > p2.getY()) ..... 0.50
            System.out.println(p1.getColor()); ..... 0.50
        else ..... 0.50
            System.out.println(p2.getColor()); ..... 0.50
    }
}
```


Result					
Question No.	Relevant Student Outcome	SO is Covered by %	Full Mark	Student Mark	Assessor's Feedback
1	a	33	10		
2	c	40	12		
3	c	27	8		
Totals		100%	30		
I certify that the work contained within this assignment is all my own work and referenced where required. Student Signature: _____ Date: _____					Feedback Received: Student Signature: _____ Date: _____