

King Fahd University of Petroleum and Minerals
 College of Computer Sciences and Engineering
 Information and Computer Science Department
Second Semester 2009/2010 (092)
ICS 102 - Introduction to Computing I

Major Exam 02
 Sunday, 16th May 15, 2010
 Time: 120 minutes

Name:

ID#:

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Please circle your section number below:

Section	01	02	03	04	05
Instructor	Ghouti	Ghouti	Zhioua	Al-Suhaim	Almuhamma di
Day and Time	SM 07:00- 07:50	SM 08:00- 08:50	SM 09:00 - 09:50	SM 13:10-14:00	SM 10:00-10:50

Question #	Maximum Marks	Obtained Marks	Remarks
1	15		
2	25		
3	20		
4	20		
5	20		
Total	100		

~Good Luck~

Q1. [15 marks, 10 + 5] Java requires all variables to be declared and instantiated before they are used.

1. Write code fragments to perform each of the following:

- (a) Declare a one-dimensional array to keep the names of 100 students.
- (b) Declare and instantiate a two-dimensional array with 8 rows and 9 columns that contains **boolean** values.
- (c) Declare and instantiate 2 two-dimensional arrays, A and B, such that A stores a 5×5 matrix, and B stores a 5×1 matrix.
- (d) Declare an array to hold the names of the months in a year.
- (e) Declare a two-dimensional array indexed from 0 through 10 for the first dimension and from 0 to 15 for the second dimension that contains **char** values.

2. Write a code fragment that declares a two-dimensional array, M, to store a 100×100 identity matrix.

Hint: the identity matrix has 1's in the main diagonal and 0's elsewhere, like this:

```
1 0 0
0 1 0
0 0 1
```

Q2. [25 marks] Determine the output of each of the following error-free code fragments. If the output is infinite or has more than 6 lines, then write only the first 6 lines.

	Code Fragment	Output
a)	<pre>int counter = 0; for (int j = 0; j <= 500; j++) counter++; System.out.println(counter); counter = 0; for (int j = 100; j > 20; j--) counter++; System.out.println(counter); for (int j = 400; j < 500; j++) counter = j; System.out.println(counter);</pre>	[3 marks]
b)	<pre>int x = 10, y = 0; while (x > ++y) x--; System.out.println(x + " " + y); x = 10; y = 0; do { x--; }while (x > ++y); System.out.println(x + " " + y);</pre>	[4 marks]
c)	<pre>int i = 0; int j = 0; int k = 0; for (i = 1; i < 4; i++) for (j = 1; j < i; j++) System.out.println(i + " " + j); k++; System.out.println(i+ " " +j+ " " +k); // Becareful: no style</pre>	[6 marks]
d)	<pre>int [] a = {10, 20, 30}; int [][] b = {{1,2,3}, {4,5,6}, {7,8,9}}; a[1] = a[2]++; b[1] = b[2]; for(int k = 0; k < b.length; k++) { System.out.println(a[k]+ " > " +b[k][1]); a[2-k]++; b[k][k] = 99; }</pre>	[6 marks]
e)	<pre>String x = "*SureNiceExam*:p"; int a = 1, b = 0; do{ System.out.print(x.charAt(a++)); //same line if(a == 3) { System.out.print(x.charAt(5*a)); b = 4 } while (a <= b) System.out.print(x.charAt(b--)); }while(b != 2); System.out.println(x.substring(9,13));</pre>	[6 marks]

Q3. [20 marks] The price of a product is marked down by 10% if you buy more than three kilos, and it is reduced by 20% if you buy over six kilos. Write a java program that prompts a user for a price per kilo (double) and the desired number of kilos (double). The program should print the total price for the product. The desired number of kilos must be at most 20.

Example:

Enter the price per kilo: **2.5**

Enter the desired number of kilos (20k max): **30**

Invalid!

Enter the desired number of kilos (20k max): **88**

Invalid!

Enter the desired number of kilos (20k max): **8**

Total amount after 20% off is: 16.0

```
public class TotalPrice {  
    public static void main(String[] args) {
```

Q4. [20 marks] Write a java program that computes the multiplication table for integers from 0 to 1000. It saves the table in a text file named "MulTable.txt". The output should be as follows:

	0	1	2	3	4	5	6	7	8	9	...	1000
0	0	0	0	0	0	0	0	0	0	0		
1	0	1	2	3	4	5	6	7	8	9		
2	0	2	4	6	8	10	12	14	16	18		
.....												
1000	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	1000000

```
public class MultiplicationTable {
    public static void main(String[] args) {
```

Q5. [20 marks] Assume you have a table representing results of soccer season of 32 teams, like:

	Win	Draw	Loss
Team 1	11	2	1
Team 2	8	3	3
Team 3	8	2	4
...			
Team 32	1	4	9

Suppose the table is saved in a file named "data.txt" that has 32 lines, and each line in the file contains 3 integers representing the win, draw, and loss counts for each team. Write a java program that stores these values in an appropriate 2-D array then creates a 1-D array to store the points. (win = 3 points, draw = 1 point, loss = 0 points). Then your program should print the information appropriately, like:

Team 1: 35 points
Team 2: 27 points
Team 3: 26 points
...
Team 32: 7 points

```
public class Soccer {  
    public static void main(String[] args) {
```