

King Fahd University of Petroleum and Minerals
College of Computer Sciences and Engineering
Information and Computer Science Department
First Semester 2010/2011 (101)
ICS 102 - Introduction to Computing I

Major Exam II
Thursday, 18th October 2010
Time: 100 minutes

Name:

Key

ID#:

--	--	--	--	--	--	--	--	--

G:

Please circle your section number below:

Section	02	04	06	08
Instructor	Almuhammadi	Almuhammadi	Zhioua	Ghouti
Day and Time	SM 08:00-08:50	SM 10:00- 10:50	SM 13:10 - 14:00	SM 09:00-09:50

Note:

1. This is a closed book, closed notes exam.
2. Usage of calculators, laptops and cell phones is prohibited during the exam.
3. Please **switch off** your cell phones NOW.

Question #	Out Of	Score	Remarks
1	26		
2	24		
3	25		
4	25		
Total	100		

~Good Luck~

Q1. [26 marks, 5+7+7+7] Write code fragments to perform each of the following tasks: (Do not write the whole program, assume all the needed classes are imported and ignore exceptions)

- (a) Create a one-dimensional array, **weekDays**, and initialize it with the days of the week abbreviated as: Sat, Sun, Mon, Tue, Wed, Thu, and Fri.

```
String [] weekDays = {"Sat", "Sun", "Mon", "Tue", "Wed", "Thu", "Fri"};
```

- (b) Declare and instantiate a one-dimensional array, **logicTable**, of 100 elements and initialize it with alternating **true** and **false** values.

true	false	true	false	true
------	-------	------	-------	------	-------

```
boolean [] logicTable = new boolean [100];
for (int j = 0; j < logicTable.length; j++)
    logicTable[j] = ((j % 2) == 0); // true only if j is even
```

- (c) Create a two-dimensional array, **M**, that stores a 100 × 100 matrix of integers such that values in the first row and the last row are 5, and everywhere else are 4.

5	5	5	5	5
4	4	4	4	4
4	4	4	4	4
.....
5	5	5	5	5

```
int [][] M = new int [100][100];
for (int j = 0; j < 100; j++) // put 5 in rows 0 and 99
    M [0][j] = M[99][j] = 5;
for (int i = 1; i < 99; i++)
    for (int j = 0; j < 100; j++)
        M[i][j] = 4; // put 4 in rows 1 through 98
```

- (d) Open the input file **myInput.txt**, then read the first line in the file and display it on the screen.

```
Scanner inputFile =
    new Scanner(new FileInputStream("myInput.txt"));
String line = inputFile.nextLine();
System.out.println(line);
```

Q2. [24 marks, 8 each] Determine the output of each of the following error-free code fragments. If the output is infinite or has more than 8 lines, then write only the first 8 lines.

	Code Fragment	Output
a)	<pre>int i = 0; int j = 0; int k = 0; // Becareful: no style for (i = 4; i > 0; --i){ for (j = 1; j < i; j++) System.out.println(i + " " + j); if (j > 0) continue; k++; } System.out.println(i+ " " +j+ " " +k);</pre>	<p>[8 marks]</p> <pre>4 1 4 2 4 3 3 1 3 2 2 1 0 1 0</pre>
b)	<pre>int [] x = {2, 4, 6}; int [][] y = {{10,12,14}, {20, 30,40}, {50}}; y[2] = y[1]; y[1] = x; x[2] = y[1][1]++; y[2][1]++; System.out.println(x[1] + " " + y[1][1]); System.out.println(x[2] + " " + y[2][1]); System.out.println(y[1][2] + " " + y[2][2]);</pre>	<p>[8 marks]</p> <pre>5 5 4 31 4 40</pre>
c)	<pre>String x = "Java-is-fun"; int n = x.length(); for (int k = 1; k < n; k+=2, n--) { System.out.println(x.substring(k,n)+k+n); }</pre>	<p>[8 marks]</p> <pre>ava-is-fun111 a-is-fu310 is-f59 -78</pre>

Q3. [25 marks] Write a program that displays all the integers between 1 and 999 that are divisible by 5 or 6, but not both. Display the output on the screen 10 numbers per line.

Hint: Use the *mod* operator (%) to test for divisibility.

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

        int count = 0; // count the numbers per line
        for(int x = 1; x <= 999; x++)
        {
            if (((x%5 == 0) && (x%6 != 0)) || ((x%5 != 0) && (x%6 == 0)))
            {
                count++;
                System.out.print(x + ", ");
                if(count == 10) // if reach end of line
                {
                    System.out.println(); // go to next line
                    count = 0; // reset counter
                }
            }
        }
    }
}
```

Q4. [25 marks] Write a program that reads from the user the class work grade and prints its letter grade. The letter grade assignment is based on the following rule:

A	B	C	D	F
≥ 90.0	≥ 80.0	≥ 70.0	≥ 60.0	< 60.0

Notes:

- 1- The program must ensure that the user enters a valid grade between **0** and **100**.
- 2- If the user enters an invalid value for the total grade, he will be prompted to re-enter the grade until a valid grade is entered.
- 3- Your program should follow the following example
 Please enter the grade: **102**
 Invalid input!
 Please enter the grade: **79.9**
 You've got: C

```
import java.util.Scanner;
public class Grades {
    public static void main(String[] args) {

        Scanner myKeyboard = new Scanner(System.in);
        double grade;
        do {
            System.out.print("Please enter the grade: ");
            grade = myKeyboard.nextDouble();
            if(grade < 0.0 || grade > 100.0)
                System.out.println("Invalid input!");
        } while(grade < 0.0 || grade > 100.0);

        System.out.print("You\'ve got: ");
        if(grade >= 90.0)
            System.out.println("A");
        else if(grade >= 80.0)
            System.out.println("B");
        else if(grade >= 70.0)
            System.out.println("C");
        else if(grade >= 60.0)
            System.out.println("D");
        else
            System.out.println("F");
    }
}
```

(Q# _____ Continue...)