King Fahd University of Petroleum and Minerals College of Computer Science and Engineering Information and Computer Science Department Second Semester 2005/2006 (061) ICS 102 – Introduction to Computing

## Final Exam Saturday, 27 January 2007 Time: 120 minutes

Name:					
ID#:					

Please *circle* your section number below:

Section	01	02	03	04	05	06
Instructor Name	Sukairi	Sukairi	Krishna	Sebakhy	Krishna	AlShanyou
Day and	SM	SM	UT	UT	UT	UT
Time	8-8:50	9-9:50	9-9:50	10-10:50	1:10-2:00	11-11:50

Question #	Maximum Marks	Obtained Marks
1	30	
2	20	
3	25	
4	25	
Total	100	

Good Luck

Q. 1

- (a) [15 marks] Design and implement a program that
  - creates an array of the first 100 odd integers i.e., {1, 3, 5, ..., 199}.
  - then prints all the elements of the array that are divisible by 3, so the output is: 3, 9, 15, ..., 195.
- (b) [15 marks] Write a method public static int[] append(int[] a, int[] b) that returns an array that contains all the elements of array a followed by all the elements of array b. For example, appending the two arrays: int[] a = {1, 4, 9, 16, 9} and int[] b = {11, 11, 7, 9, 16, 4, 1} returns an array of length 12 containing {1, 4, 9, 16, 9, 11, 11, 7, 9, 16, 4, 1}.

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Q. 2: [20 marks] The following two dimensional array **sales[4][7]** represents the sales of various products for seven days of the week at a particular superstore:

	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Clothing	200	300	250	400	300	500	600
Food	100	200	250	200	300	400	600
Electronics	400	500	300	200	100	1000	650
Stationery	45	35	65	75	45	25	15

Design and implement a program that does the following. First, the array **sales** is filled inside the program (using the above values). Then the program calculates and prints the following:

- A 1-D array of 7 elements representing the *total* sales for each day (for all types of products combined).
- A 1-D array of 4 elements representing the *average* sales for each type of product (for all days of the week combined).

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Q. 3: [25 marks] Design and implement a program that reads in a text file ("input.txt") and prints and returns the following result in a separate file "output.txt":

- The number of vowels in the file. [A vowel is one of the letters {a, e, i, o, u}].
- The number of sentences in the file [A sentence is a group of words that ends with a period(.), question mark (?) or exclamation mark(!).]

**Hint**: Read the input line-by-line and use methods **hasNextLine** and **charAt**. Use exception handling mechanism in your program wherever applicable.

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Q. 4: [25 marks] Define a method public static double standardDeviation(int[] a, int n) that takes a partially filled array of integers and computes Standard Deviation using the following formula, where *average* is the average of the n elements in the array (your method needs to compute this average).

$$StdDev = \sqrt{\sum_{i=0}^{n-1} \frac{(a[i] - average)^2}{n}}$$

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