CENG113 Computer Programming I

PROBLEM SET 6

One dimensional Arrays

Analyze the following problems and write a Java program for each of them.

a) Given the exam grades of 100 students within a file, find how many students got the average grade.

b) Given the exam grades of 40 students within a file, output only the grades below the average if the average of the exam is less than 50, otherwise output only the grades above the average.

c) A student passes a course if his overall grade is 50 or more. Given the IDs and midterm1, midterm2 and final exam grades of 75 students taking a course within a file, calculate the overall grade of each student using 0.3, 0.3 and 0.4 as the weight of each exam, respectively. Display the IDs of the students who passed that course as a list and the names of the students who failed as another list.

d) Resolve all of the questions above, assuming that you don't know the number of students, but you are sure that there are at most 200 students.

e) Given 15 numbers, validate that they are entered ordered from lowest to highest, and display them in the reverse order, thus from highest to lowest.

f) Given some numbers, where the last one is 0, validate that they are entered ordered from highest to lowest, and display them in the reverse order, thus from lowest to highest.

g) Add two 20-digit integer numbers using arrays. (Hint: You may represent each number by an array of 20 elements.)

h) Arrays can be used for vector operations. Given two vectors A and B, each with 5 integers, add the vectors A and B and put the result into another vector C, and then calculate the dot product of the vectors A and C.

Dot Product of A and C = $\sum A_i C_i$

Below, you see a sample output for a sample input:

INPUT DATA

```
5
-1
4
0
2
4
-3
2
1
-5
```

OUTPUT

```
A        +        B        =        C

5                 4                 9
-1                -3                -4
4                 2                 6
0                 1                 1
2                 -5                -3

Dot Product of A and C = 67
```