PSG COLLEGE OF TECHNOLOGY, COIMBATORE -641004
DEPARTMENT OF COMPUTER APPLICATIONS
I SEMESTER MCA
23MX16 C PROGRAMMING LABORATORY
PROBLEM SHEET 5 – ARRAYS BASED PROBLEMS

1. SALES DETAILS

Write a C program that prompts for and reads in the sales for each of 5 salespeople in a company. It then prints out the id and amount of sales for each salesperson and the total sales.

Perform following operations also.

a) Compute and print the average sale. (You can compute this directly from the total; no loop is necessary.)

b) Find and print the maximum sale. Print both the id of the salesperson with the max sale and the amount of the sale, e.g., "Salesperson 3 had the highest sale with 45000." Note that you don't need another loop for this; you can do it in the same loop where the values are read and the sum is computed.

c) Do the same for the minimum sale.

d) After the list, sum, average, max and min have been printed, ask the user to enter a value. Then print the id of each salesperson who exceeded that amount, and the amount of their sales. Also print the total number of salespeople whose sales exceeded the value entered.

e) The salespeople are objecting to having an id of 0—no one wants that designation. Modify your program so that the ids run from 1–5 instead of 0–4. Do not modify the array—just make the information for salesperson 1 reside in array location 0, and so on.

f) Instead of always reading in 5 sales amounts, at the beginning ask the user for the number of sales people and then create an array that is just the right size. The program can then proceed as before.

2. Grading Quizzes

Write a program that grades arithmetic quizzes as follows:

a. Ask the user how many questions are in the quiz.

b. Ask the user to enter the key (that is, the correct answers). There should be one answer for each question in the quiz, and each answer should be an integer. They can be entered on a single line, e.g., 34 7 13 100 81 3 9 10 321 12 might be the key for a 10-question quiz. You will need to store the key in an array.

c. Ask the user to enter the answers for the quiz to be graded. As for the key, these can be entered on a single line. Again there needs to be one for each question. Note that these answers do not need to be stored; each answer can simply be compared to the key as it is entered.

d. When the user has entered all of the answers to be graded, print the number correct and the percent correct.

When this works, add a loop so that the user can grade any number of quizzes with a single key. After the results have been printed for each quiz, ask "Grade another quiz? (y/n)."

3. A square matrix A = (a_{ij}) is called symmetric if $a_{ij} = a_{ji}$ for all indices i,j. A is called skew-symmetric if $a_{ij} = -a_{ji}$ for all indices i,j with i != j. Write a function that, given a square matrix A, computes a symmetric matrix B and a skew-symmetric matrix C satisfying A = B + C.
4. Write a C program that accepts three positive integer n, m, k and prints the third largest integer p, p <= k, such that p divides both n and m. It prints 0 if there is no such third largest p > 0. For example, n = 200, m = 100, k = 80, result is 20. Again, if n = 35, m = 25, k = 18, then the result is 0. Do not use arrays or any library functions other than standard input and output.