**Lab 9**

**Recursion and Arrays in C**

Marks: 5

**Question 01:**

Asad is working in MZ Finance Corporation and his job is to monitor the sales at the end of every month. Following table shows the Total sales in each month till October 2017:

|  |  |
| --- | --- |
| **Month** | **Total Sales in Millions (M)** |
| January | 256M |
| February | 126M |
| March | 128M |
| April | 75M |
| May | 176M |
| June | 112M |
| July | 326M |
| August | 88M |
| September | 105M |
| October | 223M |

He has hired you so that you can make a C program for him in which he can find  
  
a) Maximum and 2nd maximum sales were achieved in which months.  
b) Minimum and 2nd minimum sales were achieved in which months.  
c) Sum of total sales of all the months.  
d) Sort the sales in ascending order w.r.t. amount.  
e) Sort the sales in ascending order w.r.t. month names.  
f) Average of the sales.

**Question 02:**

Dealing with Matrices is always a fun thing for students. Just for fun, a group of students has decided to play with the matrices and they have thought about a game in which two matrices are involved of **m x n** order. User can provide the values for the matrices and mention the 2 row numbers which they want to interchange the values of. Your task is to make a C program that is able to solve and give the new matrix with interchanged values.

**Question 03:**

Searching has different techniques when it comes to programming. Finding any certain value from a given range can be done by the help of different algorithms. Generate a random list consisting of 10 numbers and search for a value taken from user. Stop only when user finds specified value. Also mention at which position it was found.

**Question 04:**

Words like mom, madam, noon, Hannah, Afifa and Level are called palindromes since they can be spelled same either from left – right, or right – left. Usman, a college student, has to make a C program which should be able to tell that whether a given input is a palindrome or not. Fortunately, he has got you with him and programming is your forte especially when it comes to recursion. You are willing to help him with his program if he gives you permission to use recursion in your program. He’s so kind that you got his permission the moment you asked him.