

COMPUTER SCIENCE
Paper – 2
(Planning Session and Examination Session : Three hours)

Instructions

As it is a practical examination the candidate is expected to do the following:

- (i) Write an algorithm for the selected problem
 - (ii) Write a program in C++/Java. Document your program by using mnemonic names and comments
 - (iii) Test run the program on the computer using the given test data and get a print out (hard copy) in the format specified in the problem along with the program listing.
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Solve any one of the following problem.

Question 1.

Design a program to accept a day number (between 1 and 366), year (in 4 digits) from the user to generate and display the corresponding date. Also accept 'N' ($1 \leq N \leq 100$) from the user to compute and display the future date corresponding to 'N' days after the generated date. Display error message if the value of the day number, year and N are not within the limit or not according to the condition specified.

Test your program for the following data and some random data.

Example:

1. INPUT :

DAY NUMBER	:	233
YEAR	:	2008
DATE AFTER(N)	:	17

OUTPUT:

20TH AUGUST 2008	
DATE AFTER 17 DAYS	: 6TH SEPTEMBER 2008

2. INPUT :

DAY NUMBER	:	360
YEAR	:	2008
DATE AFTER(N)	:	45

OUTPUT:

25TH DECEMBER 2008	
DATE AFTER 45 DAYS	: 8TH FEBRUARY 2009

Question 2.

Write a program to declare a matrix $A[][]$ of order ($m \times n$) where 'm' is the number of rows and 'n' is the number of columns such that both m and n must be greater than 2 and less than 20. Allow the user to input positive integers into this matrix. Perform the following tasks on the matrix:

- (a) Sort the elements of the outer row and column elements in ascending order using any standard sorting technique.
- (b) Calculate the sum of the outer row and column elements.

- (c) Output the original matrix, rearranged matrix and only the boundary elements of the rearranged array with their sum.

Test your program for the following data and some random data:

1. Example :

INPUT : M = 3
 N = 3
 1 7 4
 8 2 5
 6 3 9

OUTPUT :

ORIGINAL MATRIX

1	7	4
8	2	5
6	3	9

REARRANGED MATRIX

1	3	4
9	2	5
8	7	6

BOUNDARY ELEMENTS

1	3	4
9		5
8	7	6

SUM OF THE OUTER ROW AND COLUMN ELEMENTS = 43

2. Example :

INPUT : M = 2
 N = 3
 7 1 6
 8 9 2

OUTPUT :

ORIGINAL MATRIX

7	1	6
8	9	2

REARRANGED MATRIX

1	2	6
9	8	7

BOUNDARY ELEMENTS

1	2	6
9	8	7

SUM OF THE OUTER ROW AND COLUMN ELEMENTS = 33

3. Example :

INPUT : M = 4
 N = 4
 9 2 1 5
 8 13 8 4
 15 6 3 11
 7 12 23 8

OUTPUT :

ORIGINAL MATRIX

9	2	1	5
8	13	8	4
15	6	3	11
7	12	23	8

REARRANGED MATRIX

1	2	4	5
23	13	8	7
15	6	3	8
12	11	9	8

BOUNDARY ELEMENTS

1	2	4	5
23			7
15			8
12	11	9	8

SUM OF THE OUTER ROW AND COLUMN ELEMENTS = 105

Question 3.

Read a single sentence which terminates with a full stop(.). The words are to be separated with a single blank space and are in **lower case**. Arrange the words contained in the sentence according to the length of the words in ascending order. If two words are of the same length then the word occurring first in the input sentence should come first. For both, input and output the sentence must begin in upper case.

Test your program for the following data and some random data.

INPUT : The lines are printed in reverse order.

OUTPUT : In the are lines order printed reverse.

INPUT : Print the sentence in ascending order.

OUTPUT : In the print order sentence ascending.

INPUT : I love my country.

OUTPUT : I my love country.