

Question 1

- (a) Verify using truth table
 $X+(Y+Z) = (X+Y)+Z$
Also state the law
- (b) Draw logic gate diagram for given expression using NAND gate only
 $(A'+B') AB'$
- (c) Write the dual form of
 $A+1=1$
 $(X+Y)'=X'Y'$
- (d) What do mean by class? Why we define it?
- (e) Differentiate between loop and recursion?

Question 2:

Twin primes are consecutive prime numbers whose difference is 2. For example, (3,5), (11,13), (17,19) are all twin primes.

Write a program that reads in a positive integer n and prints out the twin prime pair that has the least distance from n .

For example if n is 30 the pair is (29,31), if n is 13 it is (11,13), if n is 49 it is (41,43), if n is 54 it is (59,61).

Sample data:

Input:

Give the number:34

Output:

Twin prime pair: 29,31

Input:

Give the number:60

Output:

Twin prime pair: 59,61

Question 3:

Write a program that inputs the names of people into two different arrays, A and B. Array A has N number of names while Array B has M number of names. Arrange Array A and Array B both in ascending order. Merge arrays A and B into single array C, such that the resulting array is sorted alphabetically. (Do not apply any sorting technique in 3rd array.)

Display all the three arrays, A, B and C, sorted alphabetically.

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

SAMPLE DATA

INPUT

Enter number of names in Array A, N=5

Enter number of names in Array B, M=3

Sorted First array:

Arjun

Puja

Swastik

Vinayak

Zohar

Sorted Second array:

John
Sachin
Usha

Sorted merged array

Arjun
John
Puja
Sachin
Swastik
Usha
Vinayak
Zohar

Question 4

A class called Number has been defined to find the frequency of each digit present in it and the sum of digits and to display the results some of the members of the class Number are given below:

Class name : Number

Data member/instance variable :

num : int type

Member method/function

Number(int n) : constructor to assign n to num.

void digitFrequency() : to find the frequency of each digits and to print it.

int sumDigit() : to return sum of the digits of the num.

specify the class Number giving the detail of the constructor and all function. Also Write main()

Question 5

Class name : NumberArray

Data member/instance variable :

num[] : An integer array

size : size of the array

Member method/function

NumberArray(int) : parameterized constructor to initialize size and allocate memory for the num[].

void input() : to accept values in the array num[]

void removeSort() : form every element of array remove all occurrence of 0 and after that arrange them in ascending order.

void print() : to print the content of array

specify the class NumberArray giving the detail of the two constructor and function void input(), void remove(), void print(). Also Write main()