

PAT 1 Question

Perfect Number is a number which is having the value equal to the sum of its positive divisors, excluding the number.

for example : 6 is having the divisors as 1,2 and 3. If we sum up the divisors $1+2+3$, then we shall get the value 6.

Define two positive integers x_1 and x_2 . Find the number of perfect numbers between x_1 and x_2 . Sum up all the perfect numbers between x_1 and x_2 . Write a C Program to print the perfect numbers between x_1 and x_2 along with their divisors and the final sum.

Input : $x_1 = 1$, $x_2 = 100$

Output :

6 - 1,2,3

28 - 1,2,4,7,14

Final sum : 34

PAT 2 Question

Declare an array of prime numbers from 1 to 100.

Print the contents of the array

Select the prime numbers whose sum of digits are 5 and 5 multiples and store them in another array

print the contents of the array

Use two functions for the following tasks

1. To find the prime number
2. To find the 5 and 5 multiples sum elements in another array from the first step using the address of the elements

IPS 1

Find the Fibonacci Series till 100. From the output series, find and pick out the prime numbers alone and print.

Input : 100

Output : 2,3,5,13,89

IPS 2

Write a C program and subsequent pseudo code to implement the pointers and make your friend “Aakash” to understand the concept of pointers, so that he can participate in the competition named Codeathon, organized by VIT @ VIT.

Given Task: To perform arithmetic operations (+, -, *, and /) on 2 integer numbers using pointers by defining the 2 functions one for **Arithmetic** Operations named **My_Arithmetic()**, with 2 arguments of type pointers and no return values. The other is the recursive function **My_Fact ()** **with 1 argument a pointer** to compute the Factorial of difference of two inputted values and **return** the value of Factorial of a number.

Input : Read two integers

Output : Addition, Subtraction, Multiplication and Division.

Factorial of a Number.

Note : if both the inputted numbers are 0, print “Zeros”.

and Factorial(0) or Factorial of a -ve Numbers is always 1.

Challenging Task Question

Let us assume that there are n students in the class who are studying m courses. Consider the students are writing a test for 100 marks for every course thrice in a semester. Use structures to define the basic entities of the student.

a) Write a function to calculate and print the GPA out of 10 for every student using absolute grading method. (Average of all the marks to the number of courses)

b) Write the second function to check and print the following for every student.

If the GPA is between 9.0-10, then print a beautiful circle and write inside the circle an alphabet E using the character 'E'

If the GPA is between 7.0-8.9, then print a triangular flowerpots pattern using the character 'O'

if the GPA is between 4.0-6.9, then print a star pattern using the character '*'

If the GPA is between 1.0-3.9, then print a hollow square pattern using the character '^'

Ensure that every pattern is printed in a square envelop of less than or equal to 10.

Input : Marks of the student

Output : GPA, Pattern which is relevant to student marks

Example :

$n = 4$ $m = 2$

Input : 89 90 45 32 78 67 90 92

Output 6.7 3.85 7.25 9.1

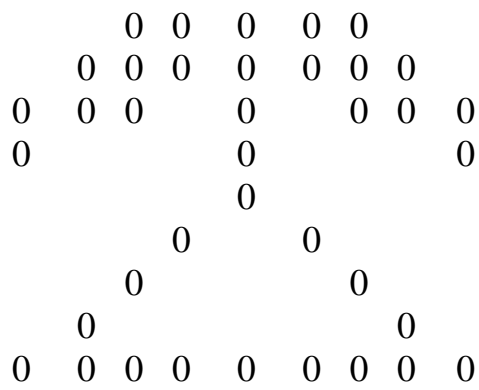
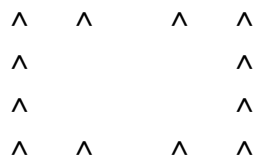
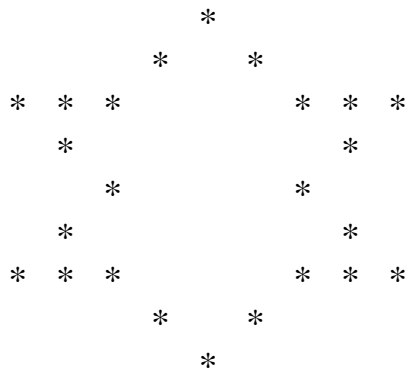


Diagram illustrating the arrangement of 12 'E' characters forming a triangular shape. The characters are arranged in four rows: the top row has 3 'E's, the second row has 2, the third row has 1, and the bottom row has 2. The 'E's are arranged in a way that suggests a larger triangular structure with some missing characters.