

C_project1

1.

This function declares a variable to store user input, prompts the user to enter a number,

reads the input, and then uses a switch statement to classify the number into one of four categories. The result is printed to the console.

This returns 0 on successful execution.

2.

This function takes a vector of integers as input and prints its elements in

the format: [element1, element2, ...]

param v is the vector to be printed.

3.

The program initializes the first two terms of the Fibonacci sequence and outputs them.

It then enters a loop to generate the remaining terms until a limit (4,000,000) is reached.

The terms are calculated by adding the previous two terms, and the loop continues until the

next term exceeds the limit. The generated terms are printed as part of the Fibonacci sequence.

It returns 0 on successful execution.

4a.

This function takes an integer 'n' as input and returns a boolean indicating whether 'n' is a prime number.

param n is the number to be checked for primality.

This returns True if 'n' is prime, false otherwise.

4b.

This function takes an integer 'n' as input and returns a vector containing all the factors of 'n'.

param n is the number to be factorized.

It returns a vector of factors of 'n'.

4c. prime_factorize function takes an integer 'n' as input and returns a vector containing the prime factors of 'n'.

parameter is The number to be factorized.

return is vector of prime factors of 'n'.

5.

$$\binom{n}{r+1} = \frac{n!}{(r+1)!(n-r-1)!} = \frac{n!(n-r)}{r!(r+1)(n-r-1)!(n-r)} = \frac{n!(n-r)}{r!(r+1)(n-r)!} = \binom{n}{r} * \frac{n-r}{(r+1)}$$

The coefficients in Pascal's Triangle are calculated using the binomial coefficient formula: $C(n, k) = C(n, k-1) * (n - k + 1) / k$, where $C(n, k)$ is the coefficient at row n and position k .

This function takes an integer 'n' as input and prints the coefficients of Pascal's Triangle up to the n th row.

It uses nested loops to iterate through each row and each element in the row.

The current coefficient is calculated and printed, and the loop proceeds to the next element.

The result is displayed as a triangle in the console.