Fundamental Algorithms and Factoring Methods

Author : AI Generated

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Fundamental Algorithms

Fundamental algorithms include basic problem-solving techniques like exchanging values, counting, summing, and factorial computation.

Exchanging

Swapping values between two variables using temporary storage or arithmetic operations.

Counting

Counting involves iterating through data to determine occurrences of specific elements.

Summing

Summing computes the total of a series of numbers, commonly used in statistical analysis.

Factorial Computation

Factorial (n!) is the product of all positive integers up to n, used in permutations and probability calculations.

Fibonacci Sequence

A sequence where each term is the sum of the two preceding ones, commonly found in nature and algorithms.

Reversing the Digit-Base Conversion

Changing numerical bases (e.g., decimal to binary) using repeated division and remainder techniques.

Character to Number Conversion

Methods like ASCII encoding are used to convert characters into numeric representations for computation.

Factoring Methods

Factoring methods include mathematical techniques to find components of numbers, such as prime factorization and square root extraction.

Finding Square Root

Techniques like the Newton-Raphson method help approximate square roots efficiently.

Greatest Common Divisor (GCD)

The GCD of two numbers is the largest number that divides both without leaving a remainder, found using the Euclidean algorithm.

Prime Number and Prime Factorization

A prime number is a number with only two factors: 1 and itself. Prime factorization breaks a number down into its prime components.

Pseudocode and Flowchart

Pseudocode provides a structured algorithm representation, while flowcharts visually depict logical steps.