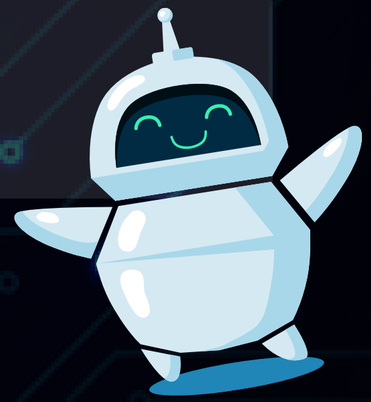
DIFFERENT TYPES OF ALGORITHM

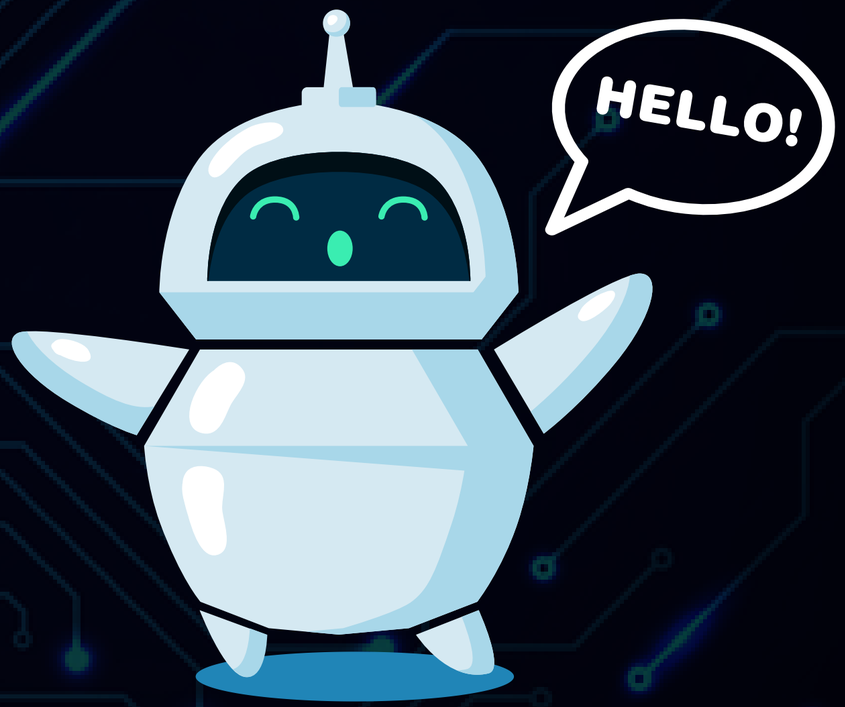


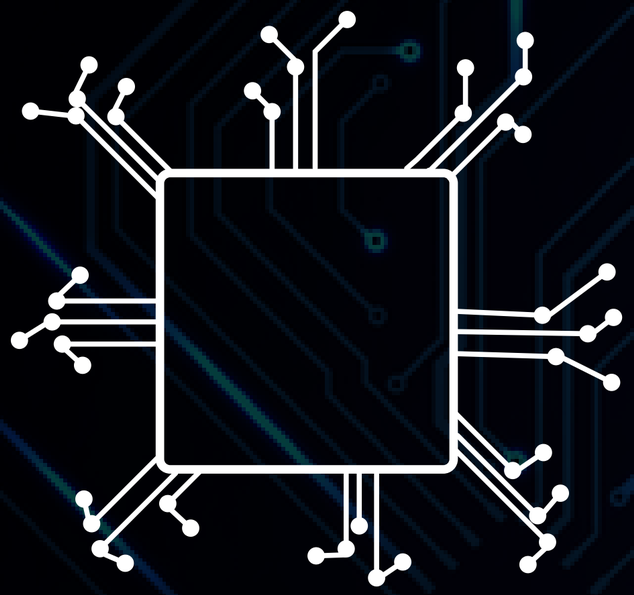
INTRODUCTION

Algorithm is a step by step procedure to solve a problem or perform a task, it must be finite and well defined with input and output. It also need a efficiency, correctness, and resource usage.

RECURSIVE / ITERATIVE ALGORITHMS

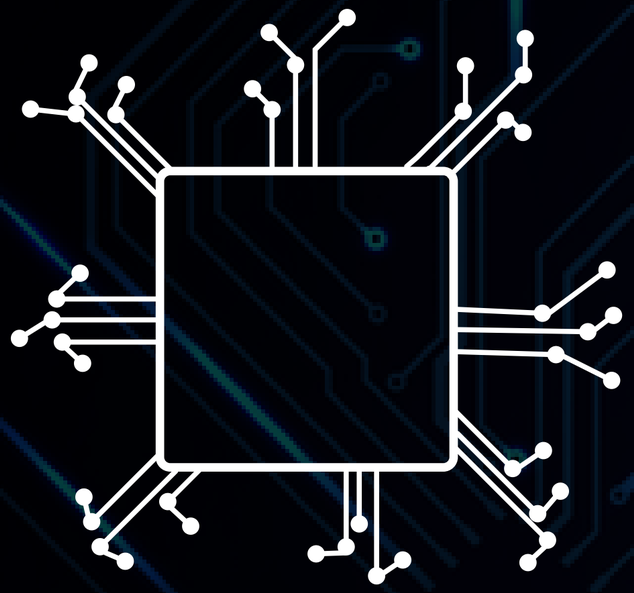
Definition of recursion & iteration.
Example Recursion: Factorial, Fibonacci, Tower of Hanoi.
Example Iteration: Looping through array, iterative factorial.





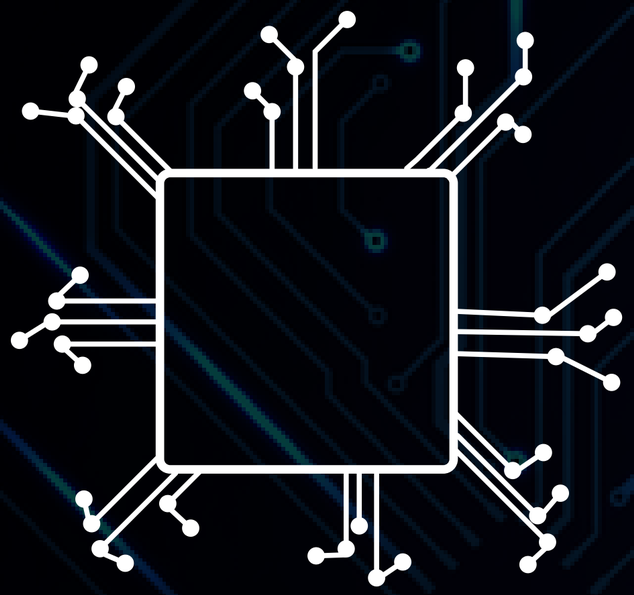
DIVIDE & CONQUER ALGORITHMS

Definition: break problem into subproblems, solve each, then combine.
Examples: Merge Sort, Quick Sort, Binary Search, Karatsuba's multiplication.



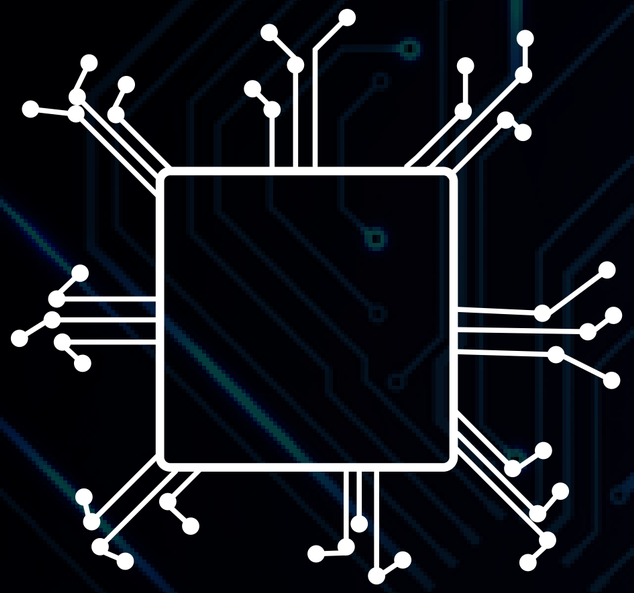
GREEDY ALGORITHMS

Definition: locally optimal choice at each step, hoping global optimum.
Examples: Huffman Coding, Kruskal's Minimum Spanning Tree, Prim's, Dijkstra's.



BRUTE FORCE ALGORITHMS

Definition: try all possibilities until find a solution.
Example: trying all PIN combinations; exact string matching by checking every position.



RANDOMIZED ALGORITHMS

Definition: use randomness as part of decision making.
Examples: Randomized QuickSort (choosing random pivot), Monte Carlo algorithms (where correct result may occur with probability), Las Vegas algorithms.