Dept. of CSE
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Greedy Algorithms: Introduction

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Greedy Algorithms

- A greedy algorithm always makes the choice that looks best at the moment. That is, it makes a locally optimal choice in the hope that this choice will lead to a globally optimal solution. We will explore some **optimization** problems for which greedy algorithms provide optimal solutions.

- The greedy method is quite powerful and works well for a wide range of problems. **It does not always yield optimal solutions**, but for many problems they do.

- Optimization can be of two types – **Maximization and Minimization.**

Greedy Algorithms

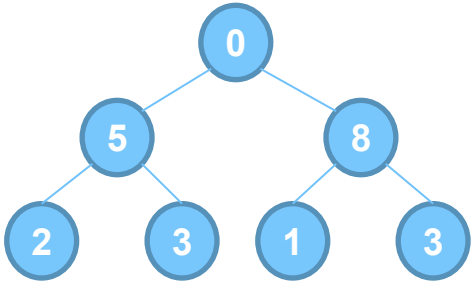
➢ **Advantages**

- They are easier to implement
- They require much less computing resources
- They are much faster to execute
- Greedy algorithms are used to solve optimization problems

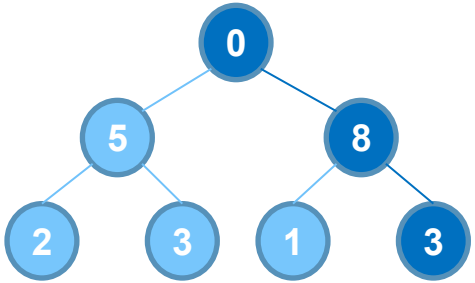
➢ **Disadvantages**

- They don’t always reach the global optimum solution

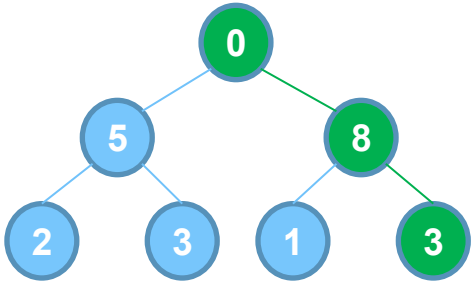
Greedy Choice



Graph

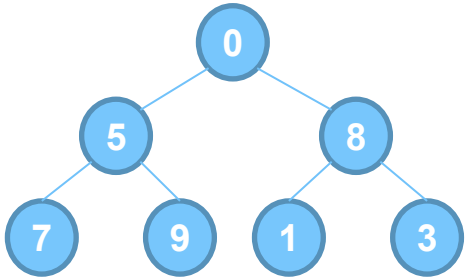


Greedy

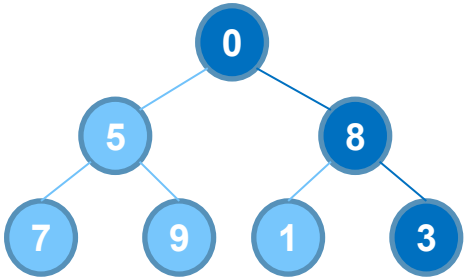


Optimal

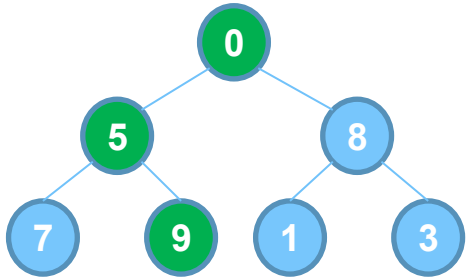
Doesn't always guarantee the best solution…



Graph



Greedy



Optimal

Application of Greedy Design Techniques

01 Fractional Knapsack Problem

02 Activity Selection Problem

03 Job Sequencing Problem

04 Data Compression (Huffman Coding)

05 Minimum Spanning Tree (Kruskal's Algorithm, Prim's Algorithm), Shortest Path (Dijkstra's Algorithm)

Thank You