

Graphs Quickstart Guide

In this mini-workbook, we'll get you up and running with graphs.

In this guide, we will quickly highlight the key concepts that you need to know for your interview.

If you're unfamiliar with any of these, I highly recommend taking some time to review them.

Then, I've provided you with a series of daily exercises to help you get up and running quickly. I recommend using these similarly to how you use your daily workbook. Do one set of exercises each day and be sure to log them in your tracker. This will help you ensure that you've reviewed all the most important points.

If you're feeling a little weak on your Graphs skills, [I highly recommend checking out this video](#) before diving into the specifics.

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Key Graph Terminology

- **Directed Graph**
A graph with connections that are directed. If Node A is connected to Node B, then that does not imply that Node B is connected to Node A
- **Undirected Graph**
A graph where if Node A is connected to Node B, then Node B is connected to Node A
- **Weighted Graph**
A graph where the edges between nodes are assigned a weight
- **Adjacency Matrix**
A representation of a graph where an $N \times N$ boolean matrix represents the edges. $matrix[i][j]$ represents an edge from Node i to Node j
- **Adjacency List**
Similar to an adjacency matrix, except that we only track the actual edges and not all possible edges. For each node i , we keep a list of all of the nodes that i points to

Key Graph Patterns

- **Basic Graph Operations**
 - Convert between different graph representations
 - Insert a node
 - Remove a node
- **Searching**
 - DFS
 - BFS
 - Find a path between two nodes
 - Do this for both directed and undirected graphs
 - Find the lowest weighted path between two nodes in a weighted graph (Dijkstra's Algorithm)
- **Coloring**
 - Determine whether a graph is N colorable
- **Representing Real World Interconnections**
 - Course scheduling
 - Handling real world dependencies

Daily Exercises

Coming soon!