**MY CLASS RECORDING PLAYLIST:** [**https://youtube.com/playlist?list=PLgU-6-TtNPAzpauVSPWpKFbmu5Rbc2dEQ&si=PAzhNHH1uGKTAaTf**](https://youtube.com/playlist?list=PLgU-6-TtNPAzpauVSPWpKFbmu5Rbc2dEQ&si=PAzhNHH1uGKTAaTf)

**[dijkstra class is missing, giving some supplementary links for that]**

**For dijkstra algo:** [**Dijkstra's Shortest Path Algorithm | Graph Theory**](https://www.youtube.com/watch?v=pSqmAO-m7Lk&t=199s&ab_channel=WilliamFiset)

**[you can ignore the optimization parts and just focus on the simulation for now]**

**\*\*\*\*\*GRAPH\*\*\*\*\*\***

**Topic:GRAPH:** [**6. Graph [HFN] Supplementary videos**](https://docs.google.com/document/d/1sxSvO5w_Au8mpINOR6Y90dFo6x2Uze6gCqOTV9BX1os/edit?usp=sharing) **[DONT SEE THE THINGS IN THIS FILE THAT ARE NOT MENTIONED IN THIS LIST]**

**1. Basic/RECAP:**

**BFS + DFS :**

**Lecture 1 [BFS needed, Start from 1h 17 minutes mark]:** [**https://youtu.be/-kP2g7IfZr4?si=Yfi4Z7h-81PgMTxE**](https://youtu.be/-kP2g7IfZr4?si=Yfi4Z7h-81PgMTxE)

**Lecture 2 [DFS]:**

[**https://youtu.be/O1mII8stMZc?si=gY1yvZnt14-nHFsD**](https://youtu.be/O1mII8stMZc?si=gY1yvZnt14-nHFsD)

**\*\*\*\*\*PATH FINDING/ SHORTEEST PATH ALGO\*\*\*\*\***

**2. FOR DIJKSTRA SIMULATION FOLLOW THIS VIDEO:**

**Single source shortest path algorithms: [USE THESE VIDEOs]**

[**Dijkstra's Shortest Path Algorithm | Graph Theory**](https://www.youtube.com/watch?v=pSqmAO-m7Lk)

**[Ignore the optimization parts]**

[**Graph Data Structure 4. Dijkstra’s Shortest Path Algorithm**](https://www.youtube.com/watch?v=pVfj6mxhdMw&t=573s&ab_channel=ComputerScience)

**Negative weight cycle issue:** [**Why Dijkstra's Algorithm Doesn't Work with Negative Weights**](https://www.youtube.com/watch?v=eXPw7BBMFNk&ab_channel=CarlthePerson)

**To handle that, we use: [Must study Bellman Ford Algorithm along with dijkstra above]**

[**Bellman Ford Algorithm | Shortest path & Negative cycles | Graph Theory**](https://www.youtube.com/watch?v=lyw4FaxrwHg&t=224s)

**3. \*\*\*\*\*\*MINIMUM SPANNING TREE\*\*\*\*\*\***

**Minimum Spanning Tree:** [**6.4 Dijkstra+ MST.pdf**](https://drive.google.com/file/d/1PDNW7cZaeBRBftnYA5RcY2qZoTdD9ueR/view?usp=drive_link) **[SLIDE]**

**[refer to my recordings Lecture** [**Video 5**](https://youtu.be/h_gHnTpFYqM?si=w4QG8kH753AbSGgL) **,** [**Video 6**](https://youtu.be/GP8TdRC4ZKE?si=q7wYrgBS-BCZMpT6) **There are detailed discussion about a data structure called Disjoint Set Union, hold it for now I will discuss it in class]**

1. **Prims Algo:** [**Prim's Minimum Spanning Tree Algorithm | Graph Theory**](https://www.youtube.com/watch?v=jsmMtJpPnhU&ab_channel=WilliamFiset)
2. **Kruskal Algo:**[**Union Find Kruskal's Algorithm**](https://www.youtube.com/watch?v=JZBQLXgSGfs&ab_channel=WilliamFiset)
3. **Prims vs kruskal:** [**https://www.baeldung.com/cs/kruskals-vs-prims-algorithm**](https://www.baeldung.com/cs/kruskals-vs-prims-algorithm)

**4. \*\*\*\*\*GREEDY ALGO\*\*\*\*\*\***

1. **Huffman coding[Greedy Algo]: [Follow my class:** [**https://youtu.be/GP8TdRC4ZKE?si=IrDptChT7ipIyiVj**](https://youtu.be/GP8TdRC4ZKE?si=IrDptChT7ipIyiVj) **]**

[**7. Huffman Coding**](https://docs.google.com/document/d/1MfVQeWIdhVrcgxKPhTzlPYrMYRue-6WxupWc00u-S8w/edit?usp=drive_link) **[all the links are given in this doc]**

1. **Fractional Knapsack [not dynamic, Greedy approach]**[**Knapsack Problem | Greedy Method | Data structure & Algorithm | Bangla Tutorial**](https://www.youtube.com/watch?v=D8x5yIfjr5Q&ab_channel=FarhanHossan)

**5. \*\*\*\*\*\*DYNAMIC PROGRAMMING\*\*\*\*\*\***

**Dynamic Programming: [refer to my recordings Lecture 7,8**

**Lecture 7:** [**https://youtu.be/2UZ\_x-Njl2s?si=Bsiq2dCeAdnDPSgU**](https://youtu.be/2UZ_x-Njl2s?si=Bsiq2dCeAdnDPSgU)

**Lecture 8:** [**https://youtu.be/tF5djZfClLU?si=pI0prnBRFvN9WDh\_**](https://youtu.be/tF5djZfClLU?si=pI0prnBRFvN9WDh_)

**]**

**Supplementary videos:**

**01 knapsack:**

[**0/1 Knapsack Problem Dynamic Programming**](https://www.youtube.com/watch?v=8LusJS5-AGo&t=815s&ab_channel=TusharRoy-CodingMadeSimple)

**LCS:** [**4.9 Longest Common Subsequence (LCS) - Recursion and Dynamic Programming**](https://www.youtube.com/watch?v=sSno9rV8Rhg&t=1130s&ab_channel=AbdulBari)

**ALL THE RELEVANT BUX SLIDES ARE GIVEN ALONG WITH THIS DOC IN THIS LINK:** [**https://drive.google.com/drive/folders/1EuJTeoAiPXXtdCI5O3k48XDK5\_z4O7xU?usp=drive\_link**](https://drive.google.com/drive/folders/1EuJTeoAiPXXtdCI5O3k48XDK5_z4O7xU?usp=drive_link)