Data Science & AI

Artificial Intelligence

Searching Algorithms

Lecture - 01

By– Sudhanshu Sir

Recap of Previous Lecture

- Topic
- Topic
- Topic
- Topic
- Topic

Topics to be Covered

Topic BFS

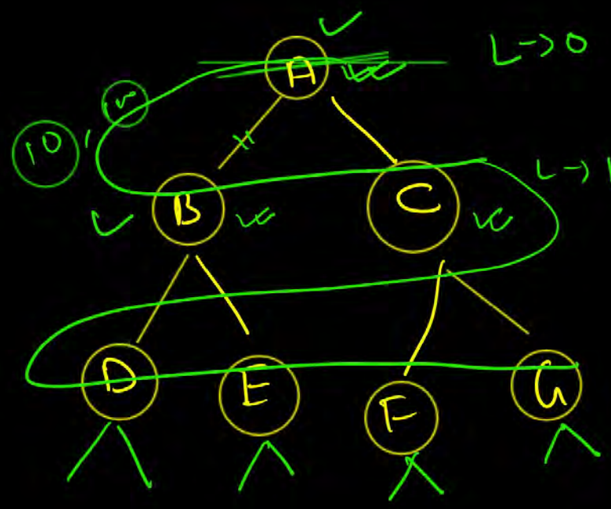
Topic DFS

Topic

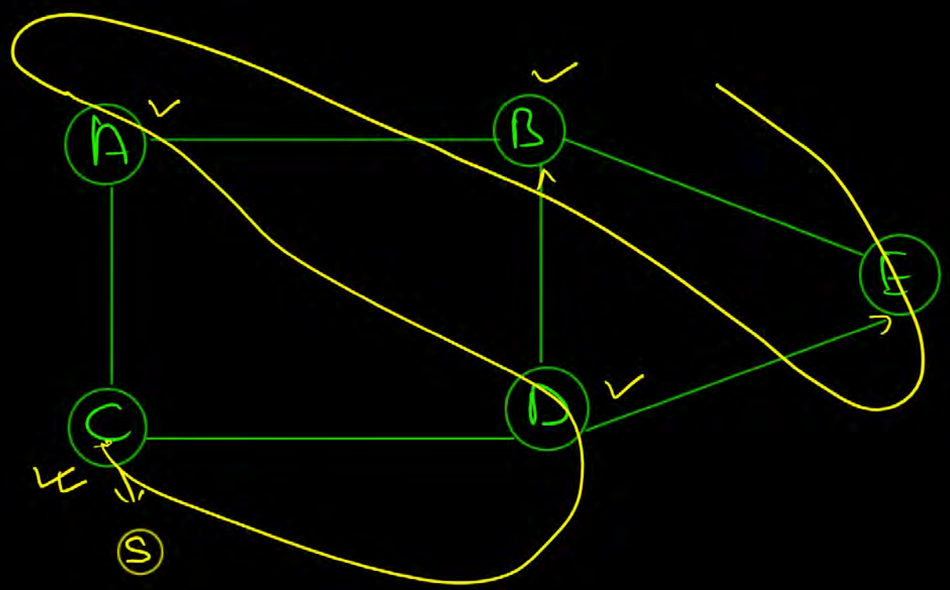
Topic

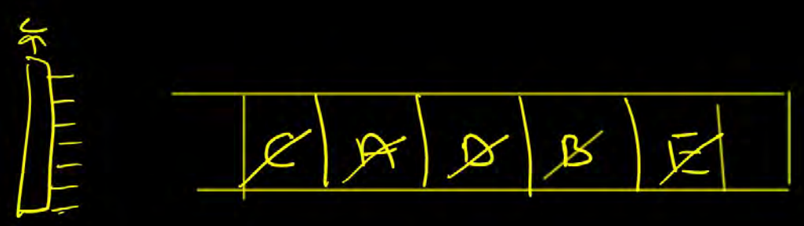
Topic

BFS (Breadth First Search)

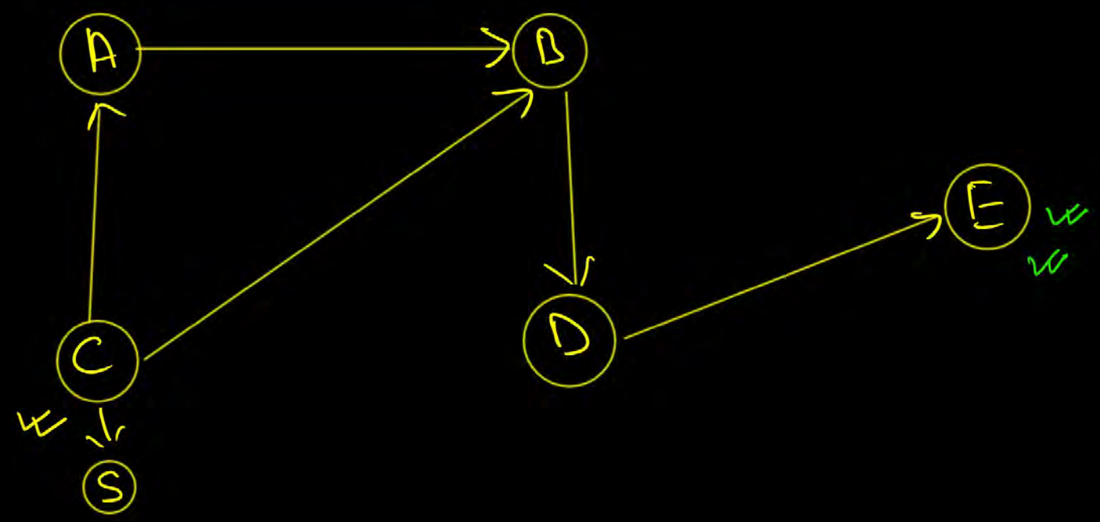


output → A B C D E F G





output → C, A, D, B, E



output → C, A, B, D, E

① Shortest Path Finding →

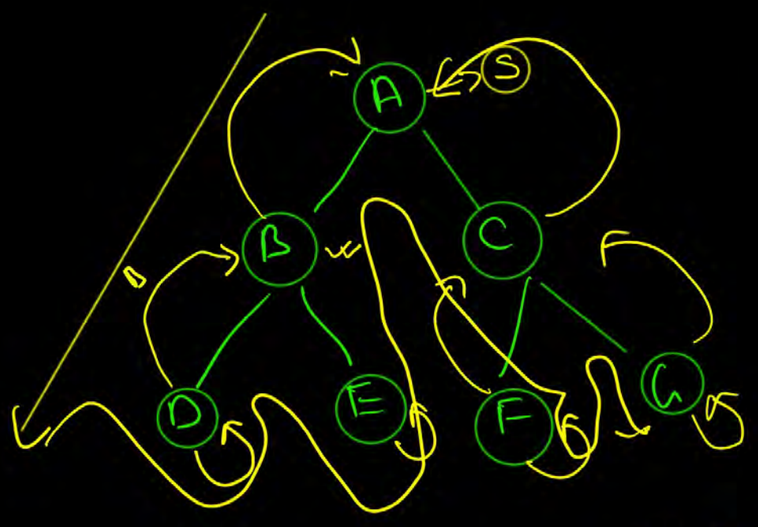
② Web Crawling.

③ Social media

④ Puzzle Solving.

⑤ Network Broadcasting.

DFS (Depth First Search)

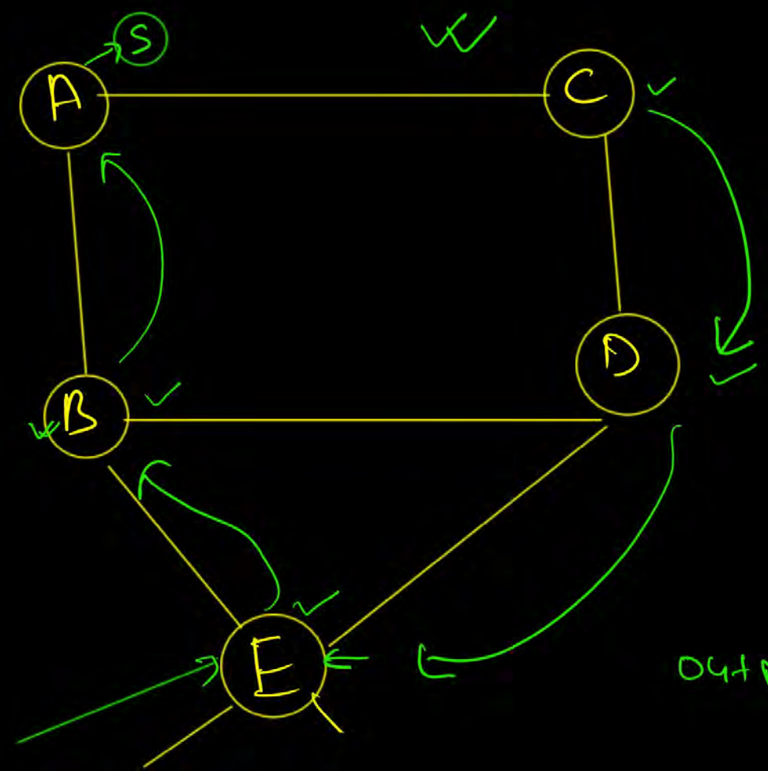


→ Backtracking

→ Basic DS Stack → (LIFO)

Output → A, B, D, E, C, F, G

DFS



Output → A, B, E, F, G, D, C

Output → G, E, F, B, A, C, D

① Maze Solving.

② Solving Sudoku.

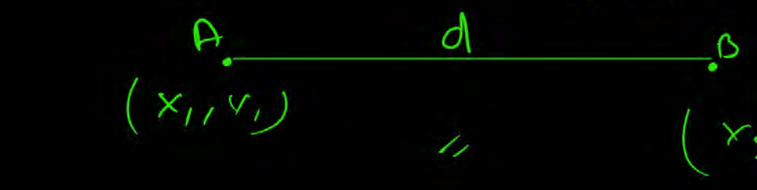
③ AI Games.

④ Symbolic mathematics.

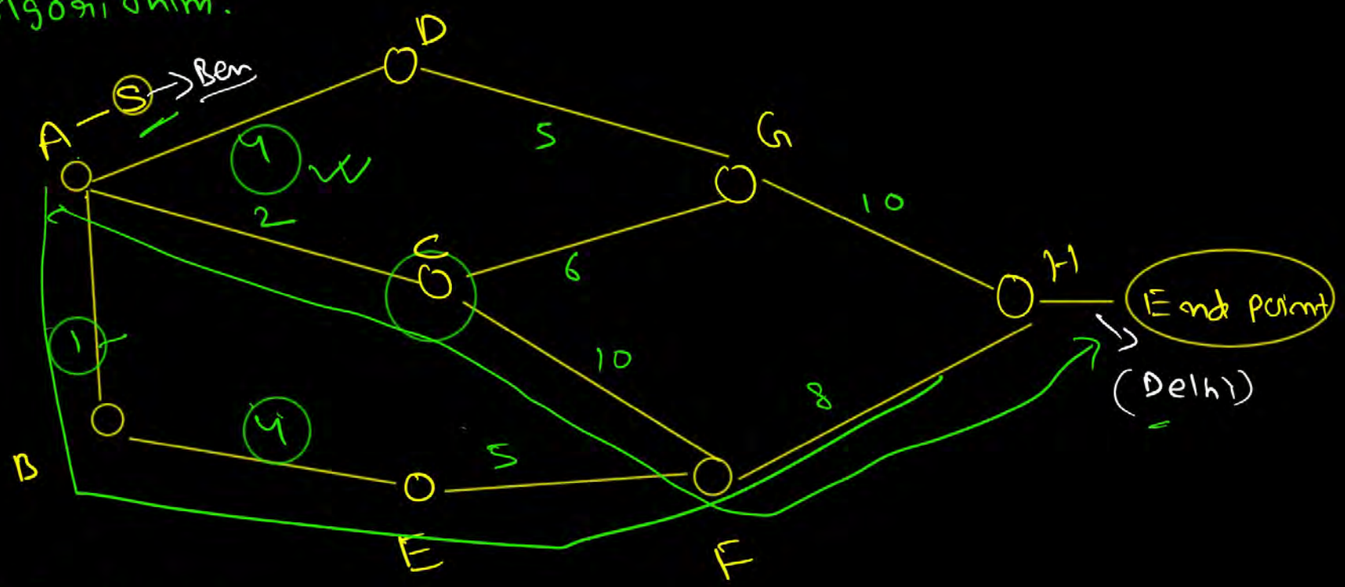
Best First search (BFS) (informed search Algorithm)

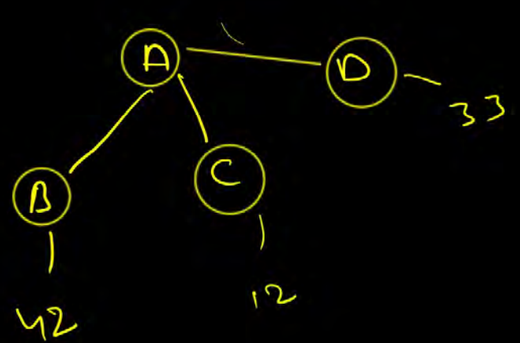
→ It's a part of informed Search Algorithm.

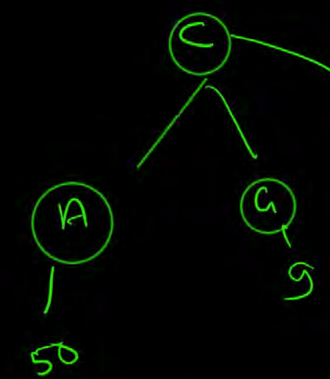
→ It's a Heuristic Algorithm



$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$







$(A \rightarrow C \rightarrow F \rightarrow H)$

AC → CF → FH

2 + 10 + 8 = (20)

AB → BE → EF → FH

1 + 4 + 5 + 8

= (18)

A → H = 50

B → H = 42

E → H = 30

F → H = 7

C → H = 12 ✗

D → H = 33

G → H = 9

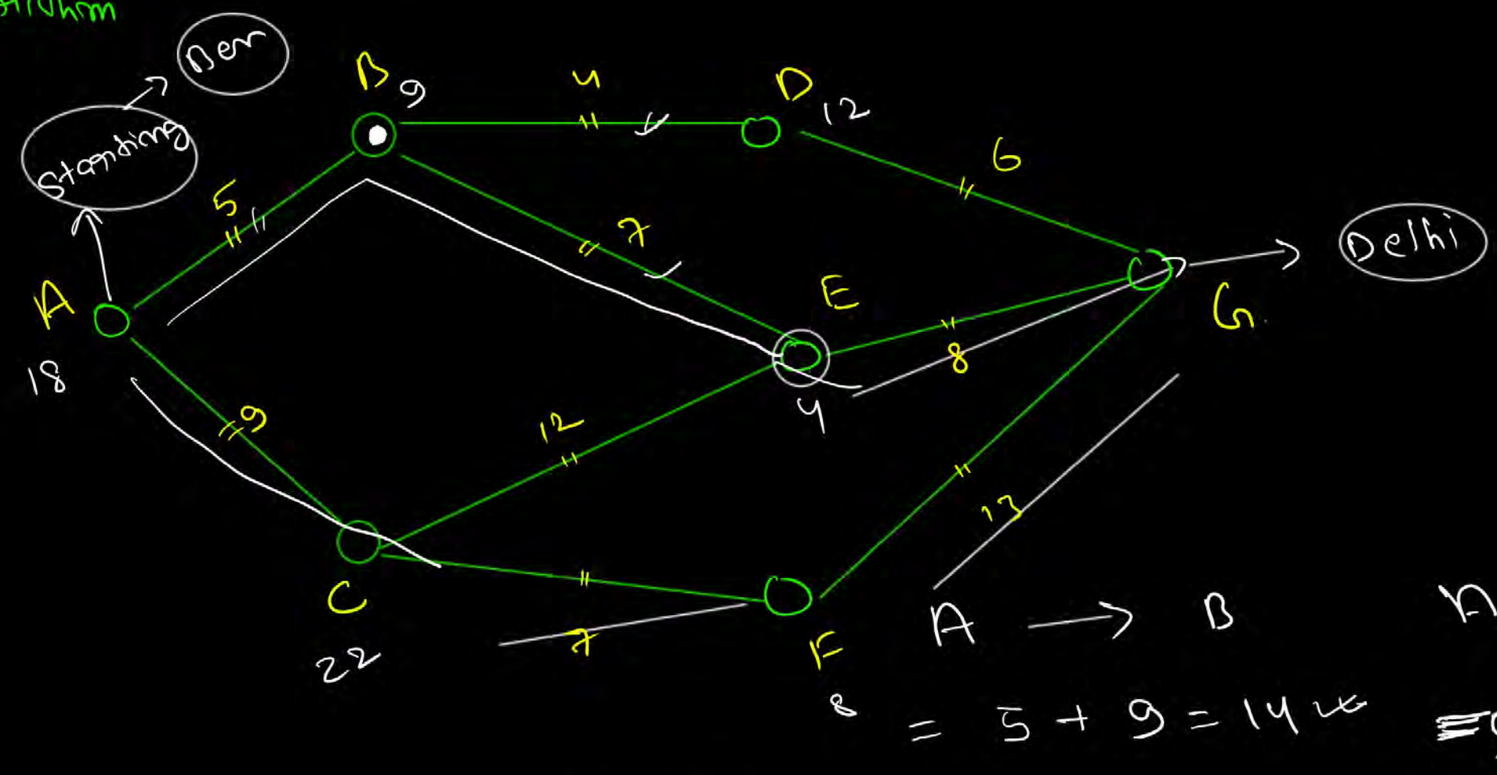
H → H = 0

A* Algorithm

① informed search algorithm

$$F(n) = g(n) + h(n)$$

(Path cost) Estimated cost



$F(A) = 0 + 18 = 18$

$= 5 + 9 = 14$ $= 9 + 22 = 31$

$AB \rightarrow D$ $AB \rightarrow E$

$= 5+4+12 = 21$ $= 5+7+4 = 16$

$(A \rightarrow B \rightarrow E \rightarrow G)$

2 mins Summary

- Topic
- Topic
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- Topic
- Topic

THANK - YOU