

BFS.

(a)

$$OL = \{S\}$$

$$CL = \{\}$$

$$OL = \{D, A\}$$

$$CL = \{S\}$$

$$OL = \{A, F, C\}$$

$$CL = \{S, D\}$$

$$OL = \{F, C, B, E\}$$

$$CL = \{S, D, A\}$$

$$OL = \{C, B, E, G\}$$

$$CL = \{S, D, A, F\}$$

$$OL = \{B, E, G, F, G, A\}$$

$$CL = \{S, D, A, F, C\}$$

$$OL = \{E, G, F, G, A, E, C\}$$

$$CL = \{S, D, A, F, C, B\}$$

$$OL = \{G, F, G, A, E, C, G\}$$

$$CL = \{S, D, A, F, C, B, E\}$$

$$OL = \{F, G, A, E, C, G\}$$

$$CL = \{S, D, A, F, C, B, E, G\}$$

Reach at Goal.



b. No. of node generated = 14  
No. of node expanded = 7

c. Path =  $S \rightarrow D \rightarrow F \rightarrow G$   
Path cost =  $10 + 5 + 3 = 18$

DFS. -

a. OL = {S}  
CL = { }

OL = {D, A}  
CL = {S}

OL = {F, C, A}  
CL = {S, D}

OL = {G, C, A}  
CL = {S, D, F}

OL = {E, A}  
CL = {S, D, F, G}

we reached at the goal G, and Terminated

b. No. of node generated = 6  
No. of node expanded = 3

c. Path =  $S \rightarrow D \rightarrow F \rightarrow G$   
Path cost =  $10 + 5 + 3 = 18$ .



## Iterative Deeping search

IDS —

9.  $K=0$ .

$OL = \{S\}$

$CL = \{\}$

$OL = \{\}$

$CL = \{\}$  // No expansion

terminated with failure.

$K=1$ .

$OL = \{S\}$

$CL = \{\}$

$OL = \{D, A\}$

$CL = \{S\}$

$OL = \{A\}$

$CL = \{S, D\}$

$OL = \{\}$

$CL = \{S, D, A\}$

// NO expansion

Terminate with failure.



$K=2$

$OL = \{S\}$

$CL = \{\cdot\}$

$OL = \{D, A\}$

$CL = \{S\}$

$OL = \{F, C, A\}$

$CL = \{S, D\}$

$OL = \{C, A\}$

$CL = \{S, D, F\}$

$OL = \{A\}$

$CL = \{S, D, F, C\}$

$OL = \{B, E\}$

$CL = \{S, D, F, C, A\}$

$OL = \{E\}$

$CL = \{S, D, F, C, A, B\}$

$OL = \{\cdot\}$

$CL = \{S, D, F, C, A, B, E\}$

Terminated with failure.



$$K = 3.$$

$$OL = \{S\}$$

$$CL = \{\}$$

$$OL = \{D, A\}$$

$$CL = \{S\}$$

$$OL = \{F, C, A\}$$

$$CL = \{S, D\}$$

$$OL = \{G, C, A\}$$

$$CL = \{S, D, F\}$$

$$OL = \{C, A\}$$

$$CL = \{S, D, F, G\}$$

No. expansion.

we have found goal state G.

b. No. of Node generated = 17

No. of node expanded = 7

(c) ~~No. of Node~~

$$\text{Path of goal} = S \rightarrow D \rightarrow F \rightarrow G$$

$$\text{Path Cost} = 10 + 5 + 3$$

$$= 18.$$



UCS:

a.

$$OL = \{S^0\}$$

$$CL = \{ \}$$

$$OL = \{D^{10}, A^1\}$$

$$CL = \{S^0\}$$

$$OL = \{D^{10}, B^{21}, E^{16}\}$$

$$CL = \{S^0, A^1\}$$

$$OL = \{B^{21}, E^{16}, F^{15}, C^{11}\}$$

$$CL = \{S^0, A^1, D^{10}\}$$

$$OL = \{B^{21}, E^{16}, F^{13}, G^{13}, A^{13}\}$$

$$CL = \{S^0, A^1, D^{10}, C^{11}\}$$

$$OL = \{B^{21}, E^{16}, F^{13}, A^{13}\}$$

$$CL = \{S^0, A^1, D^{10}, C^{11}, G^{13}\} \quad \underline{\text{Terminated.}}$$

found goal state  $G$ .

b. No. of Node generated = 10

No. of Node expanded = 4

c. Path =  $S \rightarrow D \rightarrow C \rightarrow G$

Path Cost =  $10 + 1 + 2$

= 13

Ans.