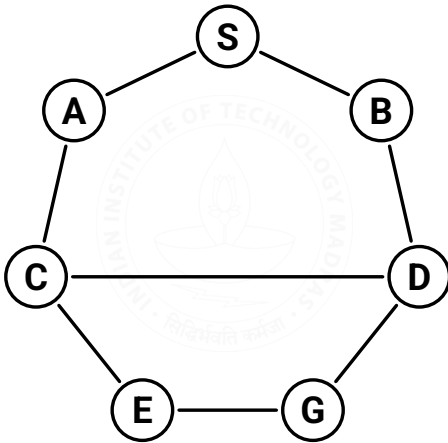


Lecture Example 3

Depth First Iterative Deepening (DFID-C)

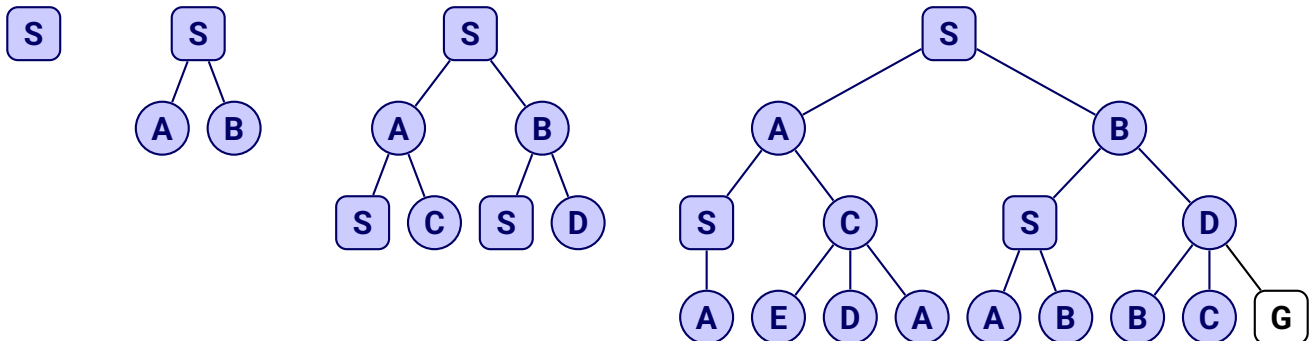
Prepared by S. Baskaran

State Space



X	MoveGen(X)
S	[A, B]
A	[S, C]
B	[S, D]
C	[E, D, A]
D	[B, C, G]
E	[C, G]
G	[D, E]

DFID-C Search Trees (d=0,1,2,3)



DFID-C Solution

The solution provided below is based on the DFID-C algorithm published in the Week 2 Notes.

OPEN and CLOSED carry triples: (NODE,PARENT,DEPTH)

[DEPTH BOUND = 0]

OPEN (S,null,0):[]
CLOSED []

1.
NODE S
close (S,null,0)
OPEN []
CLOSED (S,null,0):[]
OPEN []
CLOSED (S,null,0):[]

[DEPTH BOUND = 1]

OPEN (S,null,0):[]
CLOSED []

1.
NODE S
close (S,null,0)
moveGen A:B:[]
newNodes A:B:[]
newPairs (A,S,1):(B,S,1):[]

OPEN (A,S,1):(B,S,1):[]
CLOSED (S,null,0):[]

2.
NODE A
close (A,S,1)

OPEN (B,S,1):[]
CLOSED (A,S,1):(S,null,0):[]

3.
NODE B
close (B,S,1)

OPEN []
CLOSED (B,S,1):(A,S,1):(S,null,0):[]

[DEPTH BOUND = 2]

OPEN (S,null,0):[]
CLOSED []

1.
NODE S
close (S,null,0)
moveGen A:B:[]
newNodes A:B:[]
newPairs (A,S,1):(B,S,1):[]

OPEN (A,S,1):(B,S,1):[]
CLOSED (S,null,0):[]

2.
NODE A
close (A,S,1)
moveGen S:C:[]
newNodes S:C:[]
newPairs (S,A,2):(C,A,2):[]

OPEN (S,A,2):(C,A,2):(B,S,1):[]
CLOSED (A,S,1):(S,null,0):[]

3.
NODE S
close (S,A,2)

OPEN (C,A,2):(B,S,1):[]
CLOSED (S,A,2):(A,S,1):(S,null,0):[]

4.
NODE C
close (C,A,2)

OPEN (B,S,1):[]
CLOSED (C,A,2):(S,A,2):(A,S,1):(S,null,0):[]

5.
NODE B
close (B,S,1)
moveGen S:D:[]
newNodes S:D:[]
newPairs (S,B,2):(D,B,2):[]

OPEN (S,B,2):(D,B,2):[]
CLOSED (B,S,1):(C,A,2):(S,A,2):(A,S,1):(S,null,0):[]

6.
NODE S
close (S,B,2)

OPEN (D,B,2):[]
CLOSED (S,B,2):(B,S,1):(C,A,2):(S,A,2):(A,S,1):(S,null,0):[]

7.
NODE D
close (D,B,2)

OPEN []
CLOSED (D,B,2):(S,B,2):(B,S,1):(C,A,2):(S,A,2):(A,S,1):(S,null,0):[]

[DEPTH BOUND = 3]

OPEN (S,null,0):[]
CLOSED []

1.
NODE S
close (S,null,0)
moveGen A:B:[]
newNodes A:B:[]
newPairs (A,S,1):(B,S,1):[]

OPEN (A,S,1):(B,S,1):[]
CLOSED (S,null,0):[]

2.
NODE A
close (A,S,1)
moveGen S:C:[]
newNodes S:C:[]
newPairs (S,A,2):(C,A,2):[]

OPEN (S,A,2):(C,A,2):(B,S,1):[]
CLOSED (A,S,1):(S,null,0):[]

3.
NODE S
close (S,A,2)
moveGen A:B:[]
newNodes A:[]
newPairs (A,S,3):[]

OPEN (A,S,3):(C,A,2):(B,S,1):[]
CLOSED (S,A,2):(A,S,1):(S,null,0):[]

4.
NODE A
close (A,S,3)

OPEN (C,A,2):(B,S,1):[]
CLOSED (A,S,3):(S,A,2):(A,S,1):(S,null,0):[]

5.
NODE C
close (C,A,2)
moveGen E:D:A:[]
newNodes E:D:A:[]
newPairs (E,C,3):(D,C,3):(A,C,3):[]

OPEN (E,C,3):(D,C,3):(A,C,3):(B,S,1):[]
CLOSED (C,A,2):(A,S,3):(S,A,2):(A,S,1):(S,null,0):[]

6.
NODE E
close (E,C,3)

OPEN (D,C,3):(A,C,3):(B,S,1):[]
CLOSED (E,C,3):(C,A,2):(A,S,3):(S,A,2):(A,S,1):(S,null,0):[]

7.
NODE D
close (D,C,3)

OPEN (A,C,3):(B,S,1):[]
CLOSED (D,C,3):(E,C,3):(C,A,2):(A,S,3):(S,A,2):(A,S,1):(S,null,0):[]

8.
NODE A
close (A,C,3)

OPEN (B,S,1):[]
CLOSED (A,C,3):(D,C,3):(E,C,3):(C,A,2):(A,S,3):(S,A,2):(A,S,1):(S,null,0):[]

9.
NODE B
close (B,S,1)
moveGen S:D:[]
newNodes S:D:[]
newPairs (S,B,2):(D,B,2):[]

OPEN (S,B,2):(D,B,2):[]
CLOSED (B,S,1):(A,C,3):(D,C,3):(E,C,3):(C,A,2):(A,S,3):(S,A,2):(A,S,1):(S,null,0):[]

10.
NODE S
close (S,B,2)
moveGen A:B:[]
newNodes A:B:[]
newPairs (A,S,3):(B,S,3):[]

OPEN (A,S,3):(B,S,3):(D,B,2):[]
CLOSED (S,B,2):(B,S,1):(A,C,3):(D,C,3):(E,C,3):(C,A,2):(A,S,3):(S,A,2):(A,S,1):(S,null,0):[]

11.
NODE A
close (A,S,3)

OPEN (B,S,3):(D,B,2):[]
CLOSED (A,S,3):(S,B,2):(B,S,1):(A,C,3):(D,C,3):(E,C,3):(C,A,2):(A,S,3):(S,A,2):(A,S,1):(S,null,0):[]

12.
NODE B
close (B,S,3)

OPEN (D,B,2):[]
CLOSED (B,S,3):(A,S,3):(S,B,2):(B,S,1):(A,C,3):(D,C,3):(E,C,3):(C,A,2):(A,S,3):(S,A,2):(A,S,1):(S,null,0):[]

13.
NODE D
close (D,B,2)
moveGen B:C:G:[]
newNodes B:C:G:[]
newPairs (B,D,3):(C,D,3):(G,D,3):[]

OPEN (B,D,3):(C,D,3):(G,D,3):[]
CLOSED (D,B,2):(B,S,3):(A,S,3):(S,B,2):(B,S,1):(A,C,3):(D,C,3):(E,C,3):(C,A,2):(A,S,3):(S,A,2):(A,S,1):(S,null,0):[]

14.
NODE B
close (B,D,3)

OPEN (C,D,3):(G,D,3):[]
CLOSED (B,D,3):(D,B,2):(B,S,3):(A,S,3):(S,B,2):(B,S,1):(A,C,3):(D,C,3):(E,C,3):(C,A,2):(A,S,3):(S,A,2):(A,S,1):(S,null,0):[]

15.
NODE C
close (C,D,3)

OPEN (G,D,3):[]
CLOSED (C,D,3):(B,D,3):(D,B,2):(B,S,3):(A,S,3):(S,B,2):(B,S,1):(A,C,3):(D,C,3):(E,C,3):(C,A,2):(A,S,3):(S,A,2):(A,S,1):(S,null,0):[]

16.
NODE G
GOAL G

OPEN (G,D,3):[]
CLOSED (C,D,3):(B,D,3):(D,B,2):(B,S,3):(A,S,3):(S,B,2):(B,S,1):(A,C,3):(D,C,3):(E,C,3):(C,A,2):(A,S,3):(S,A,2):(A,S,1):(S,null,0):[]

PATH S:B:D:G:[]