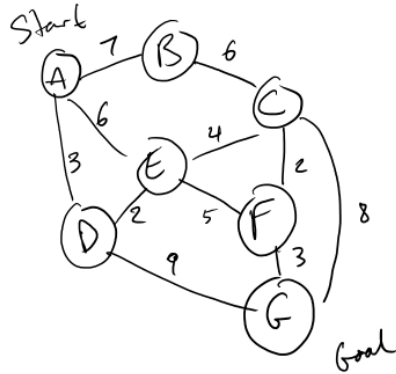


Hw1 Task2

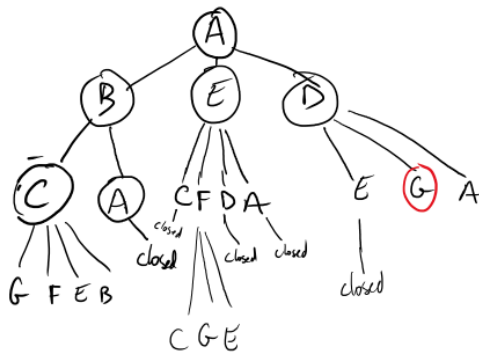
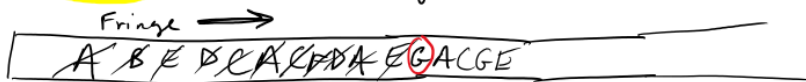
Saturday, September 19, 2020

10:12 AM

TASK 2



Breadth First Search: add in the fringe in clockwise orientation

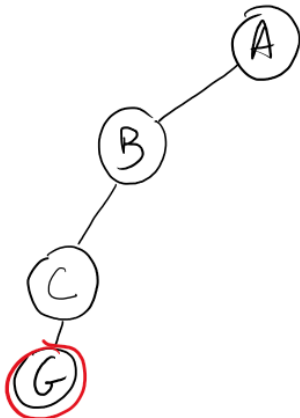


node visited/expanded: 12

node added in fringe: 16

closed
ABEDCFG

Depth First Search: added into fringe in clockwise orientation



node visited/expanded: 4
node added into fringe: 24

closed
ABC G

Iterative Deepening Search: added into fringe in clockwise orientation

Fringe →

A

Limit 0:

A

node visited/expanded: 1
node added in fringe: 1

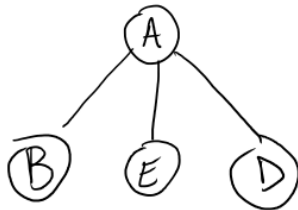
closed

A

FRINGE →

~~A~~ ~~B~~ ~~E~~ ~~D~~

Limit: 1



node visited/expanded: 4
node added in fringe: 4

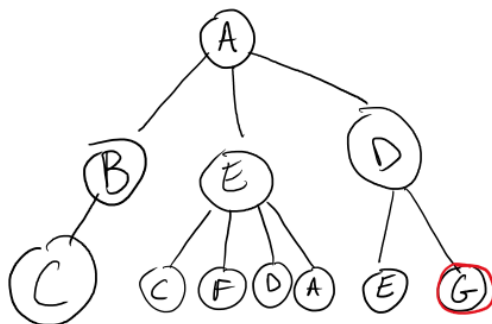
closed

ABED

FRINGE →

~~A~~ ~~B~~ ~~C~~ ~~E~~ ~~F~~ ~~D~~ ~~A~~ ~~E~~ ~~G~~

Limit: 2



node visited/expanded: 11
node added in fringe: 11

closed

ABED

Uniform Cost Search added into Fringe in the sorted order

FRINGE →
closest → farthest

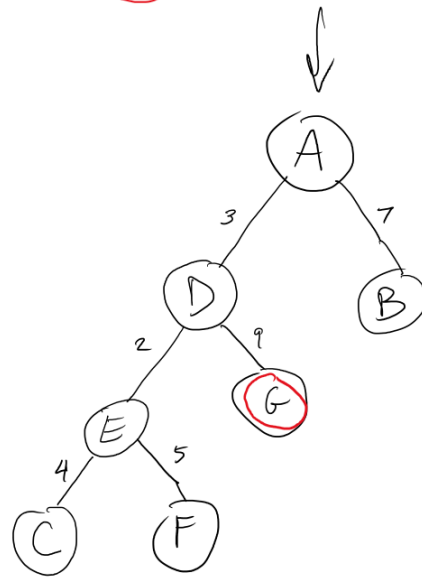
node visited/expanded: 7
node added in fringe: 17

Closed

A ₀
D ₃ E ₆ B ₇
E ₅ E ₆ B ₇ G ₁₂
E ₆ D ₇ B ₇ C ₉ F ₁₀ A ₁₁ G ₁₂
D ₇ B ₇ C ₉ F ₁₀ A ₁₁ G ₁₂
B ₇ C ₉ F ₁₀ A ₁₁ G ₁₂
C ₉ F ₁₀ A ₁₁ G ₁₂ C ₁₃
F ₁₀ A ₁₁ C ₁₁ G ₁₂ E ₁₃ B ₁₅ G ₁₇
A ₁₁ C ₁₁ <u>G</u> ₁₂ C ₁₂ E ₁₃ G ₁₃ E ₁₅ B ₁₅ G ₁₇

A₀ D₃ E₅ B₇ C₉ F₁₀ G₁₂

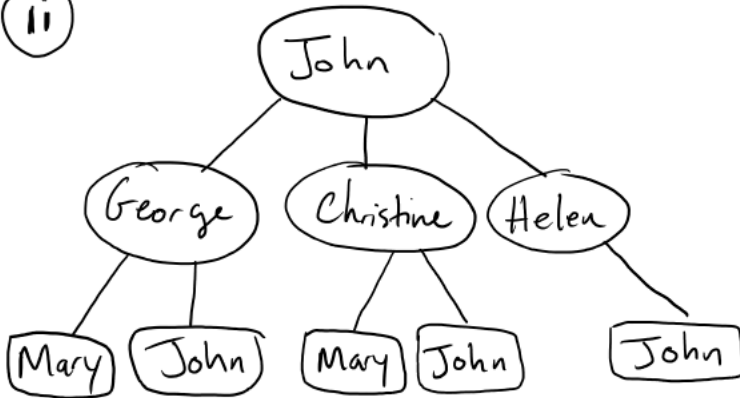
Start



Task 3

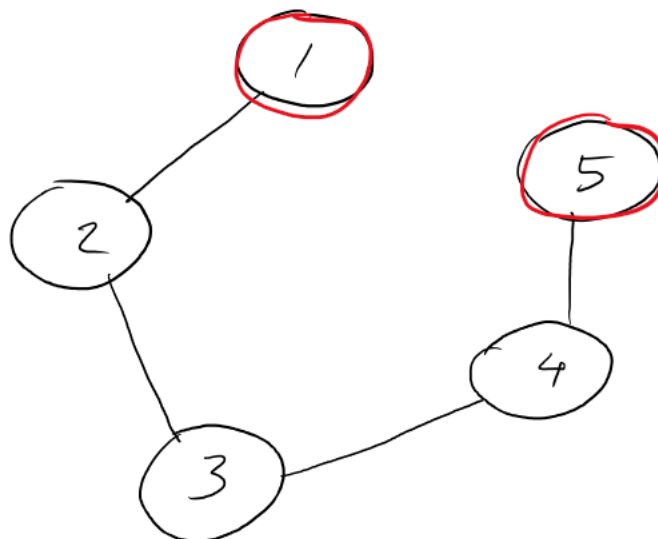
- i) Breadth First Search
Uniform Cost Search
Iterative Deepening Search

ii)

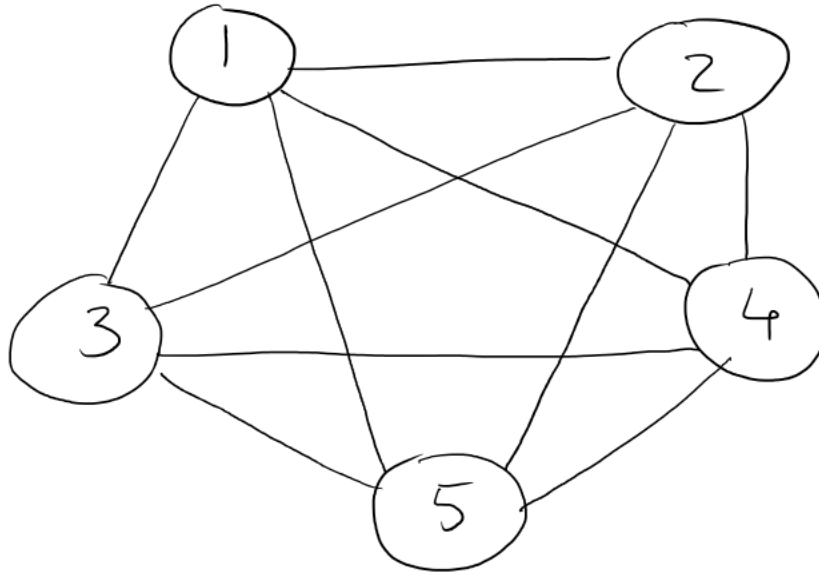


- iii) Helen and Peter have exactly one friend

iv)



V



VI

to make sure Breadth First Search
Does not exceed 1GB at 1KB per node
you need to have a visited list
if it is visited, don't add that into
the fringe, so each node is visited
exactly once

$$1\text{KB} \times 1\text{ Million} = 1\text{GB}$$

that won't exceed 1GB and be
exactly 1GB

Hw1 Task4

Monday, September 21, 2020

7:49 AM

Heuristic 1

$$h(A) = 55$$

$$h(B) = 40$$

$$h(C) = 10$$

$$h(D) = 0$$

$$h(E) = 50$$

$$h(F) = 30$$

$$D < C < F \leq B < E < A$$

non admissible

$h(F)$ cannot be $= 0$, not Goal

$h(C)$ cannot be $= 15$

Heuristic 2

$$h(A) = 55$$

$$h(B) = 40$$

$$h(C) = 10$$

$$h(D) = 0$$

$$h(E) = 50$$

$$h(F) = 30$$

non admissible

heuristic value

of all nodes can't
be the same

Heuristic 3

$$h(A) = 35$$

$$h(B) = 30$$

$$h(C) = 10$$

$$h(D) = 0$$

$$h(E) = 32$$

$$h(F) = 30$$

non admissible

$h(D)$ need to be $= 0$

$h(E)$ cannot be $= 0$

$h(C)$ cannot be ≥ 15

Heuristic 4

$$h(A) = 55$$

$$h(B) = 40$$

$$h(C) = 10$$

$$h(D) = 0$$

$$h(E) = 50$$

$$h(F) = 30$$

non admissible

Can only be one $h(n) = 0$

Hw1 Task5

Monday, September 21, 2020 8:20 AM

City \rightarrow Suburbs at least 1 suburb

Suburbs \rightarrow Suburbs at least 1 suburb
 \rightarrow City
 \rightarrow Village

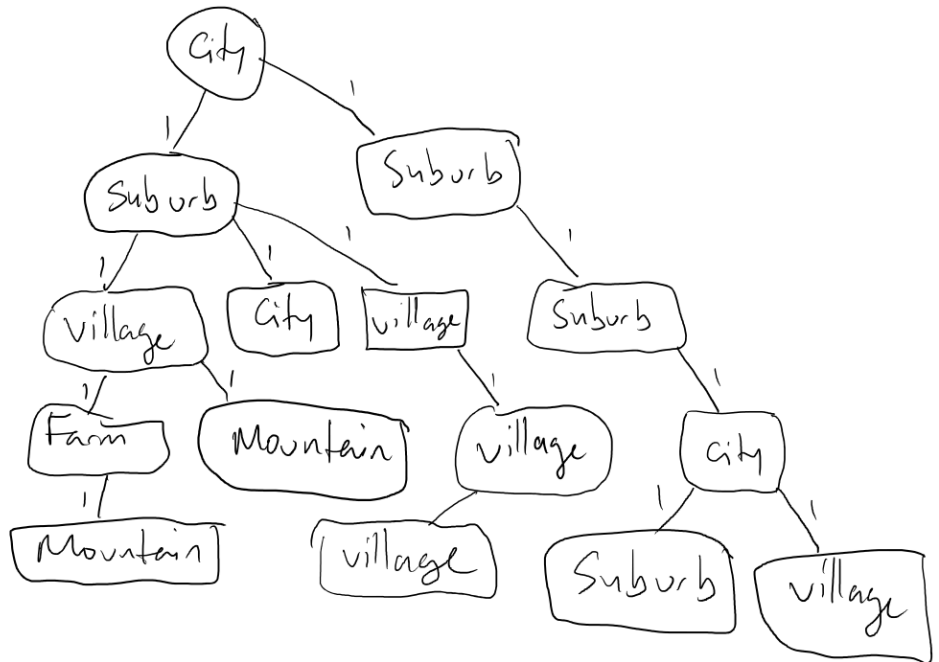
Village \rightarrow village
 \rightarrow Farm at least 1 Farm
 \rightarrow Mountain

Farm \rightarrow Village
 \rightarrow Farm at least 1 Farm
 \rightarrow Mountain

Mountain \rightarrow mountain

City \rightarrow Mountain Cost 3
 Suburb \rightarrow Mountain Cost 2
 Village \rightarrow Mountain Cost 1
 Farm \rightarrow Mountain Cost 1
 Mountain \rightarrow Mountain Cost 0

$h(\text{City}) = 2.9$
 $h(\text{Suburb}) = 1.9$
 $h(\text{Village}) = 0.9$
 $h(\text{Farm}) = 0.9$
 $h(\text{Mountain}) = 0$



Hw1 Task6

Monday, September 21, 2020

9:28 PM

A^* Search is always complete
 and return optimal solution

Whereas Greedy Search may not
 be complete and when it does,
 it may not return optimal solution