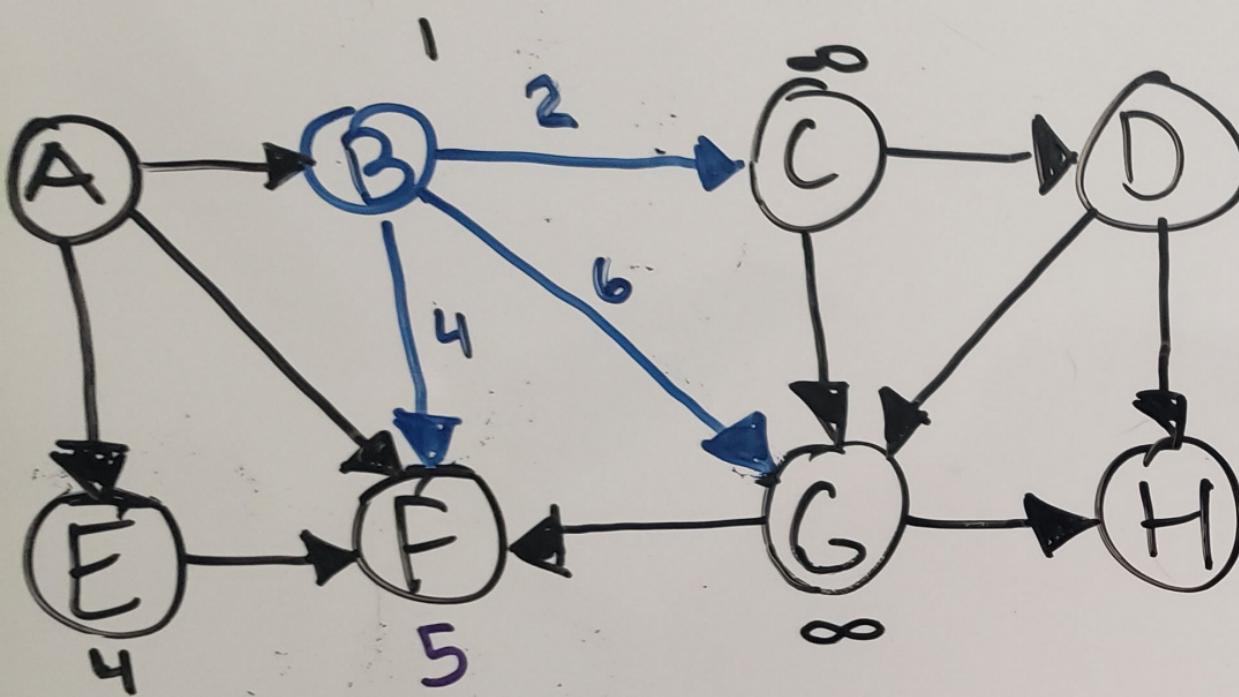


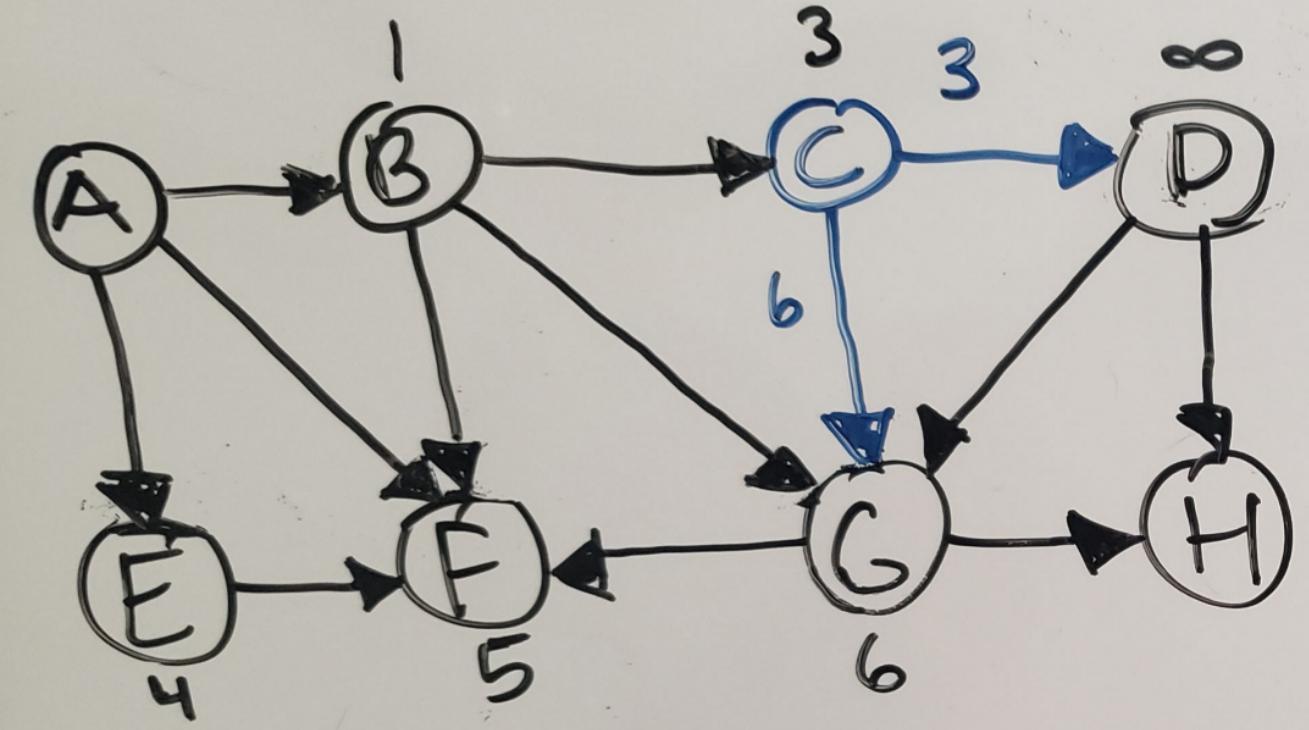
Dijkstra's

V	distTo[]	edgeTo[]
A	0	0→1
B	1.0	
C	2	
D	3	
E	4.0	0→4
F	5	0→5
G	6	
H	7	



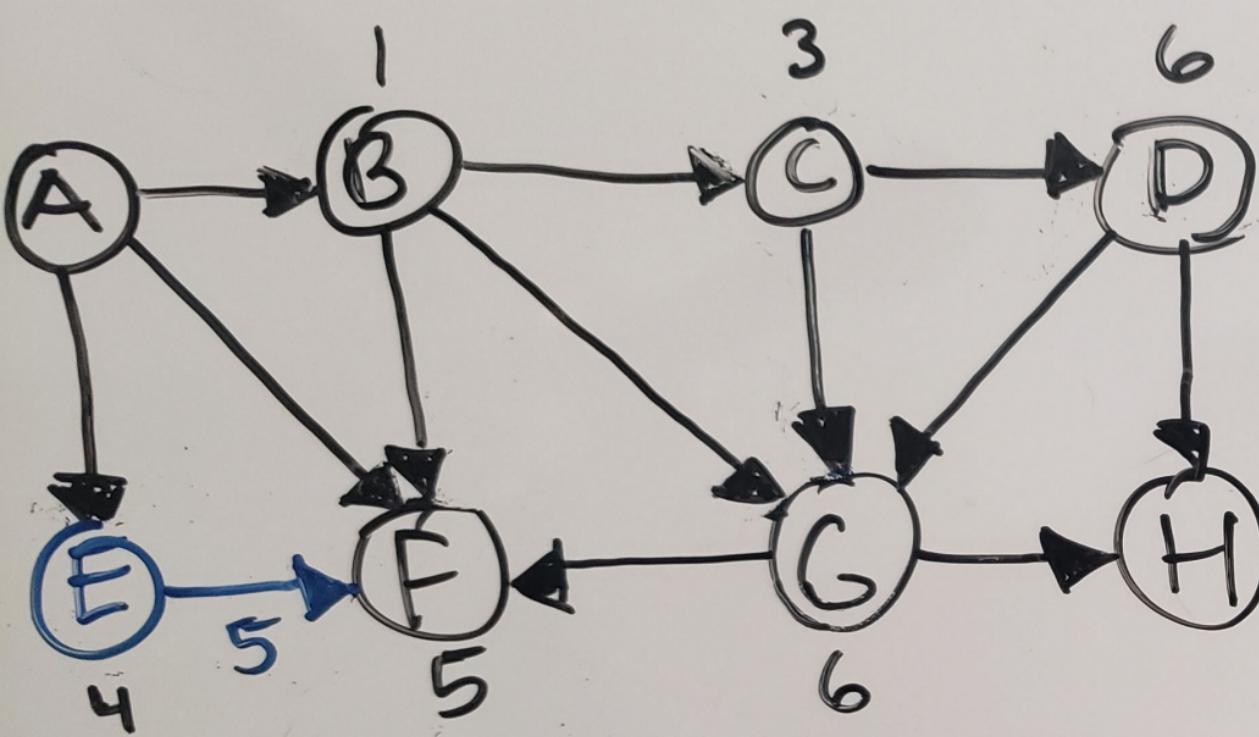
Dijkstra's

V	distTo[]	edgeTo[]
A	0	0→1
B	1.0	1→2
C	2	
D	3	
E	4.0	0→4
F	5.0	1→5
G	6	1→6
H	7	



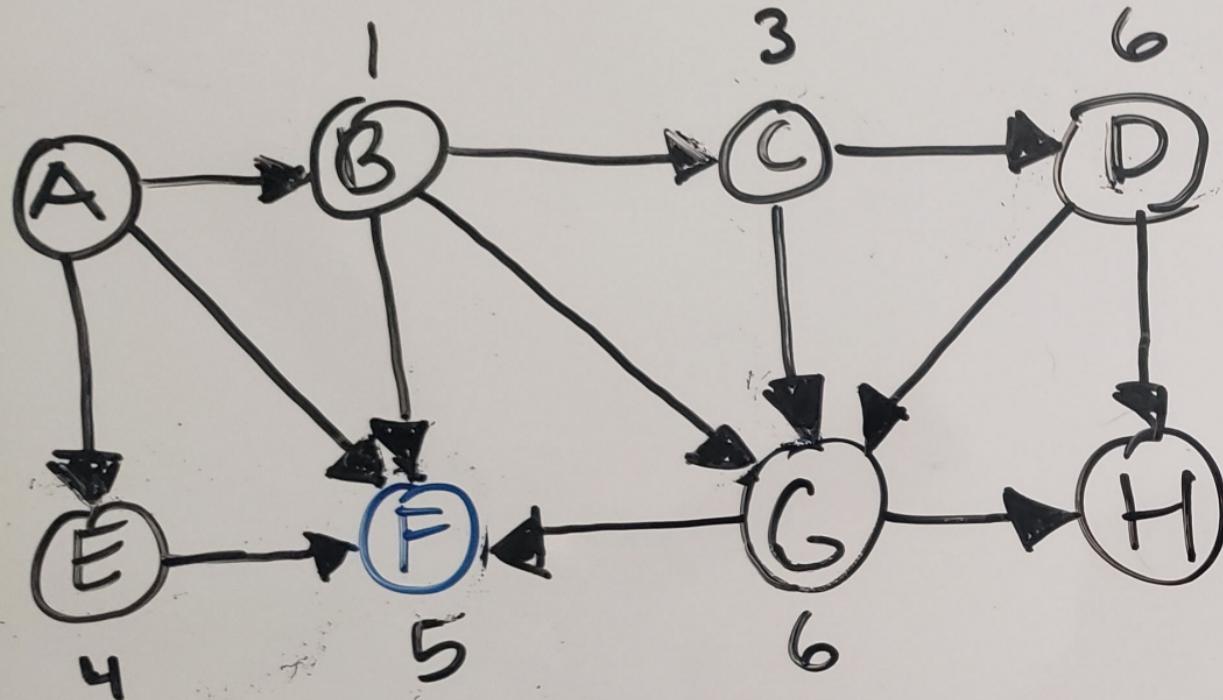
Dijkstra's

V	distTo[]	edgeTo[]
A	0	-
B	1.0	0 → 1
C	3.0	1 → 2
D	6.0	2 → 3
E	4.0	0 → 4
F	5.0	1 → 5
G	6.0	1 → 6
H	7.0	



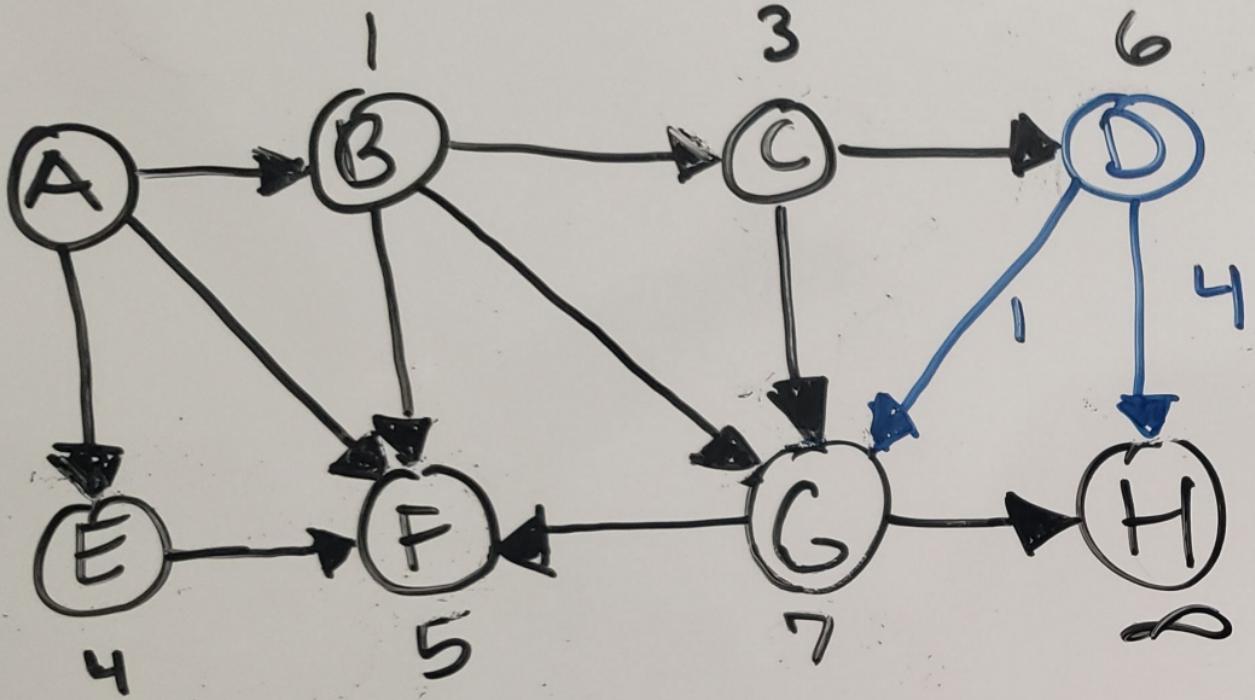
Dijkstra's

V	distTo[]	edgeTo[]
A	0	-
B	1.0	0 → 1
C	3.0	1 → 2
D	6.0	2 → 3
E	4.0	0 → 4
F	5.0	1 → 5
G	5.0	1 → 6
H	7.0	-



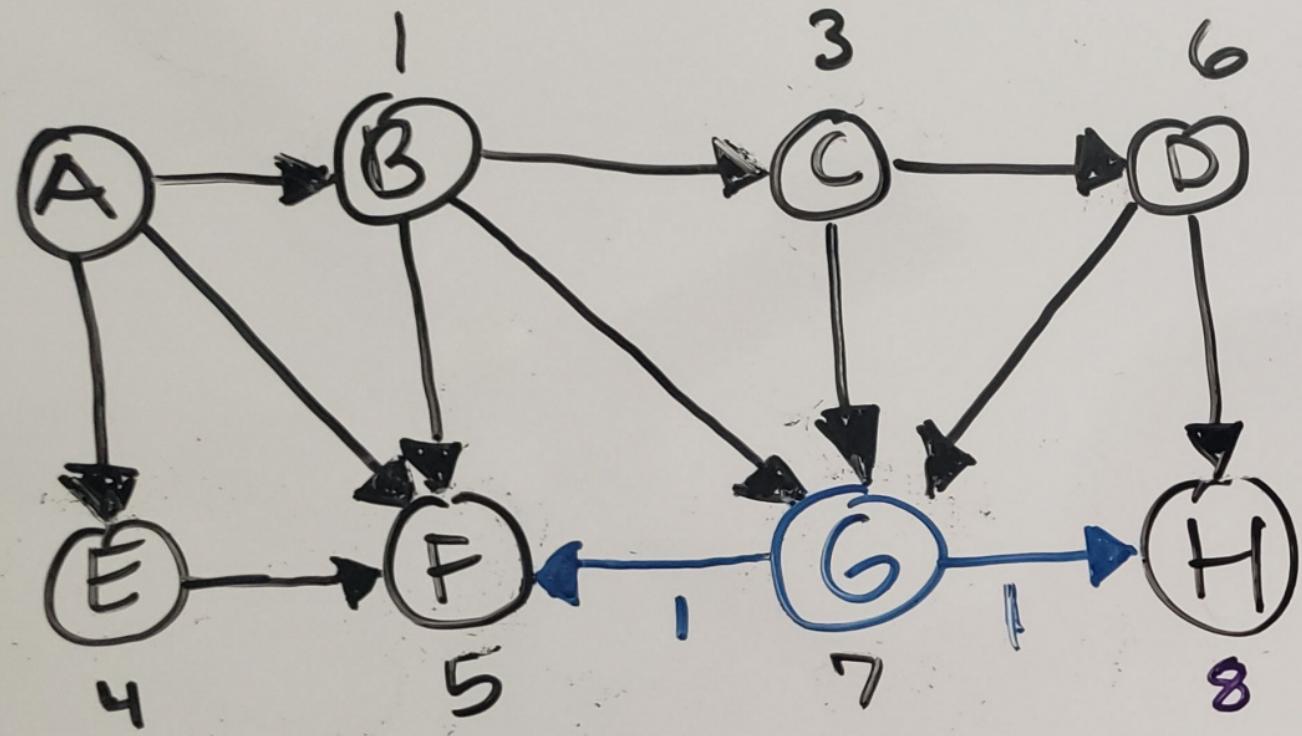
Dijkstra's

V	distTo[]	edgeTo[]
A	0	0 → 1
B	1.0	1 → 2
C	3.0	2 → 3
D	6.0	0 → 4
E	4.0	1 → 5
F	5.0	1 → 6
G	6.0	
H	7.0	



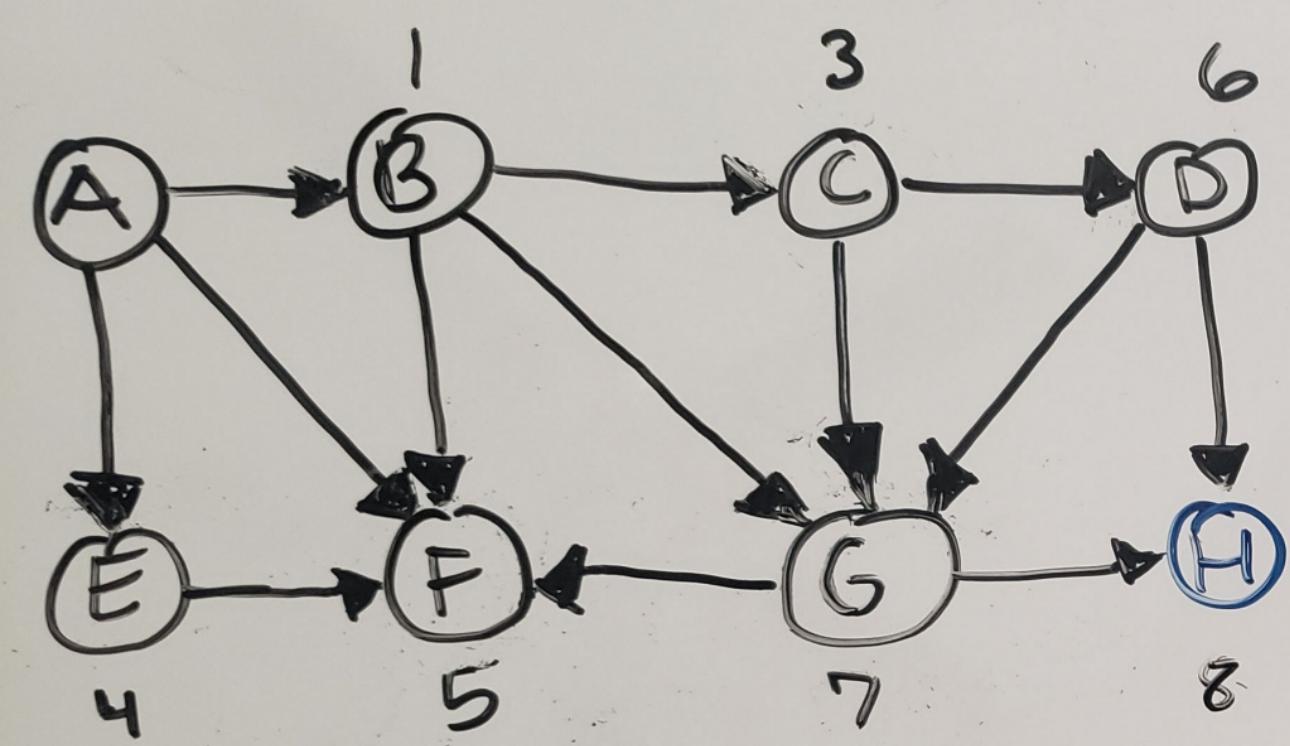
Dijkstra's

V	distTo[]	edgeTo[]
A	0	-
B	1.0	$0 \rightarrow 1$
C	3.0	$1 \rightarrow 2$
D	6.0	$2 \rightarrow 3$
E	4.0	$0 \rightarrow 4$
F	5.0	$1 \rightarrow 5$
G	7.0	$1 \rightarrow 6$
H	10.0	$3 \rightarrow 7$



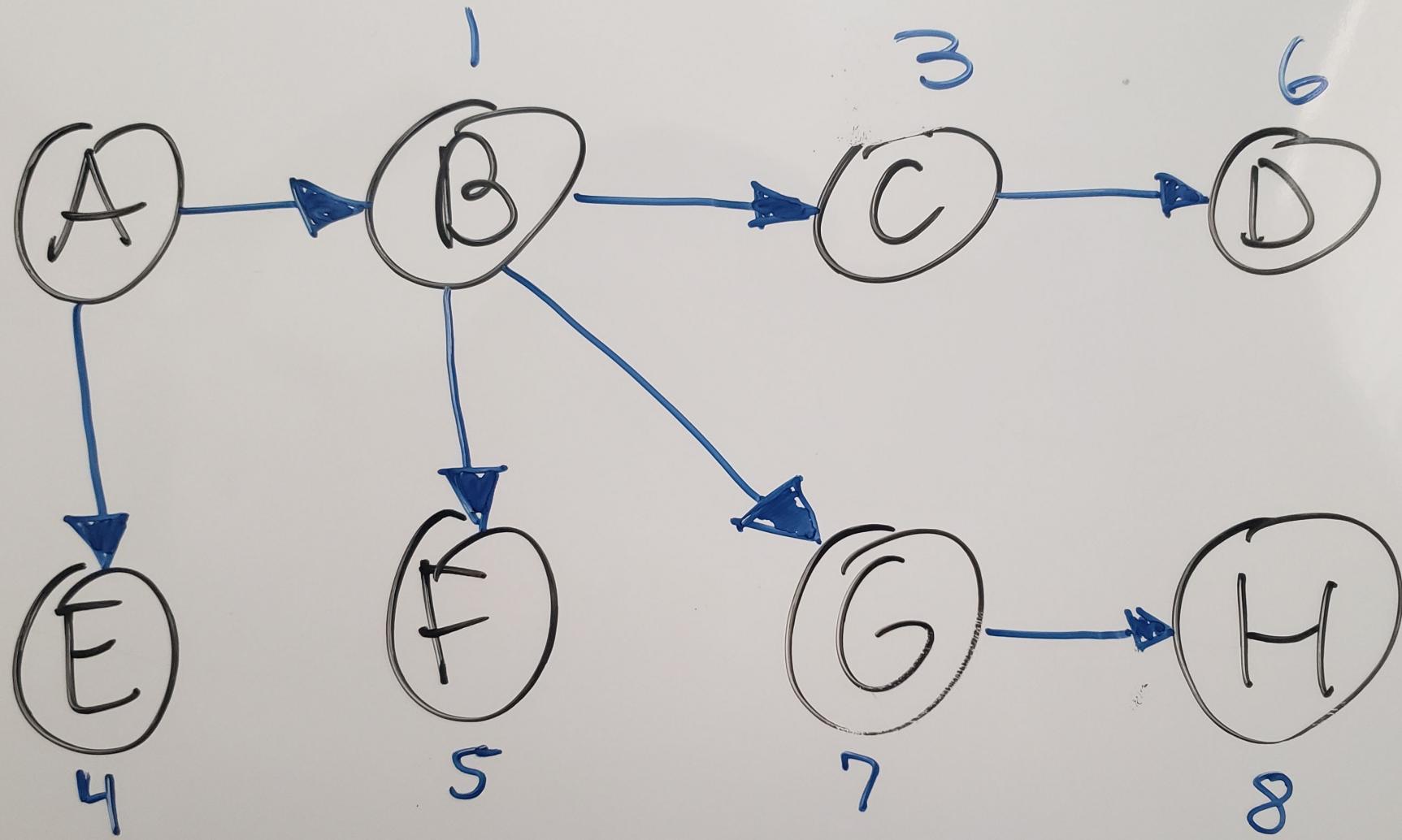
Dijkstra's

V	distTo[]	edgeTo[]
A	0	-
B	1.0	$0 \rightarrow 1$
C	3.0	$1 \rightarrow 2$
D	6.0	$2 \rightarrow 3$
E	4.0	$0 \rightarrow 4$
F	5.0	$1 \rightarrow 5$
G	7.0	$1 \rightarrow 6$
H	8.0	$6 \rightarrow 7$

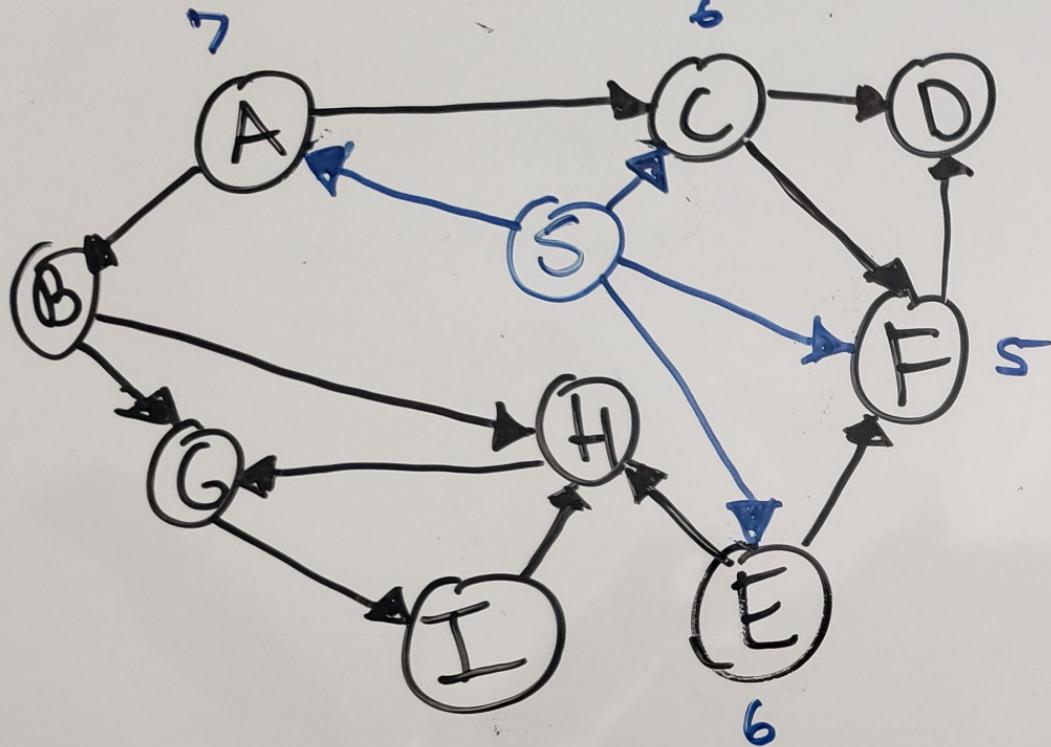


Dijkstra's

V	distTo[]	edgeTo[]
A	0	-
B	1.0	$0 \rightarrow 1$
C	3.0	$1 \rightarrow 2$
D	6.0	$2 \rightarrow 3$
E	4.0	$0 \rightarrow 4$
F	5.0	$1 \rightarrow 5$
G	7.0	$1 \rightarrow 6$
H	8.0	$6 \rightarrow 7$



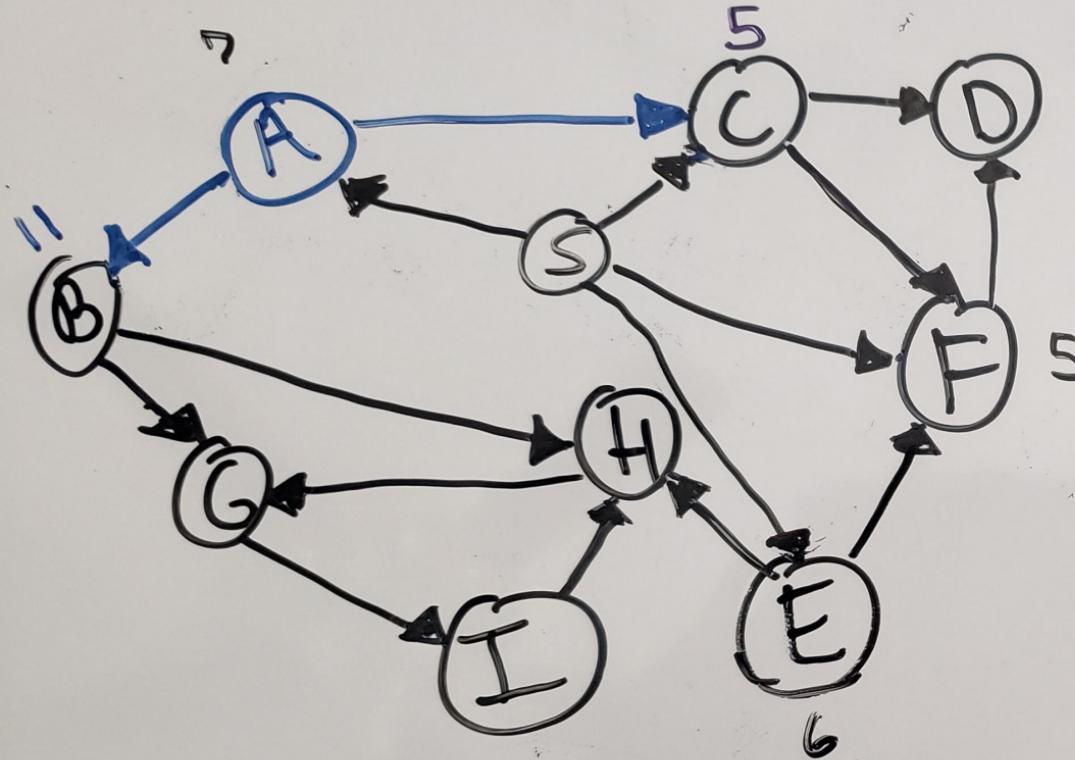
Dijkstra's Shortest Path & Costs



Bellman - Ford

I, changed to
two H's
in original
→

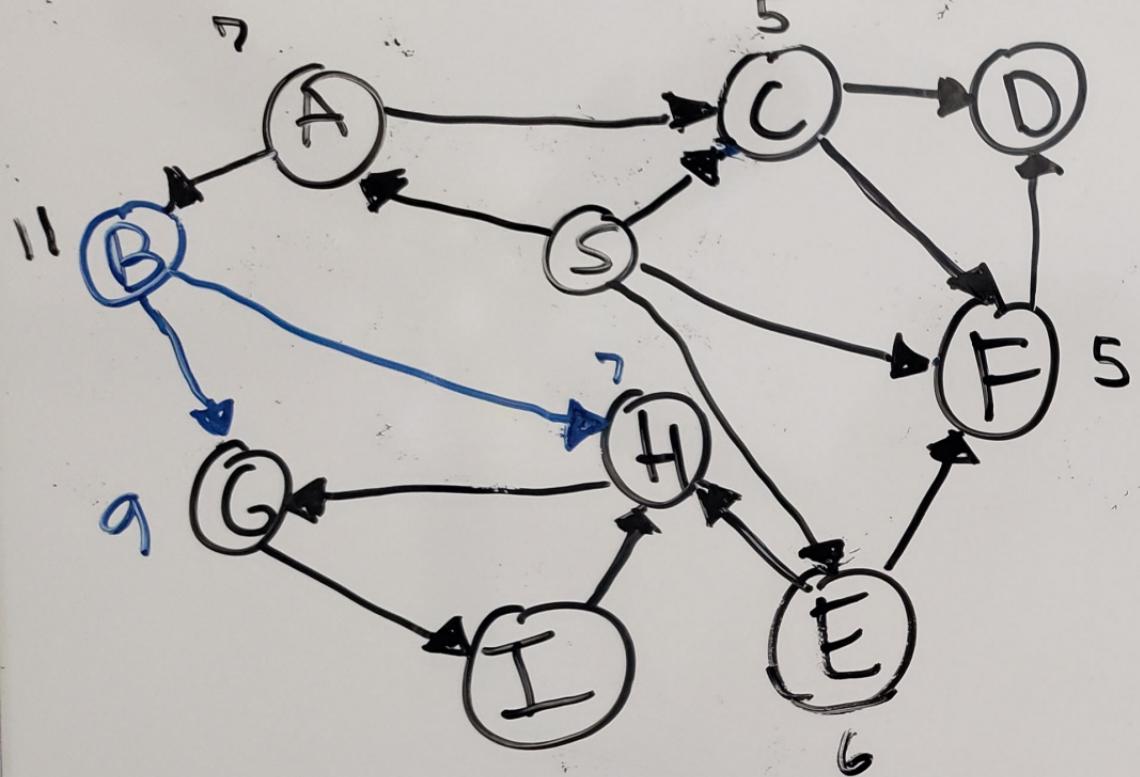
	v	distTo[]	edgeTo[]
S	0	0.0	0 → 1
A	1	7.0	
B	2		
C	3	6.0	0 → 3
D	4		
E	5	6.0	0 → 5
F	6		0 → 6
G	7		
H	8		
I	9		



Bellman - Ford

I changed to
two H's
in original

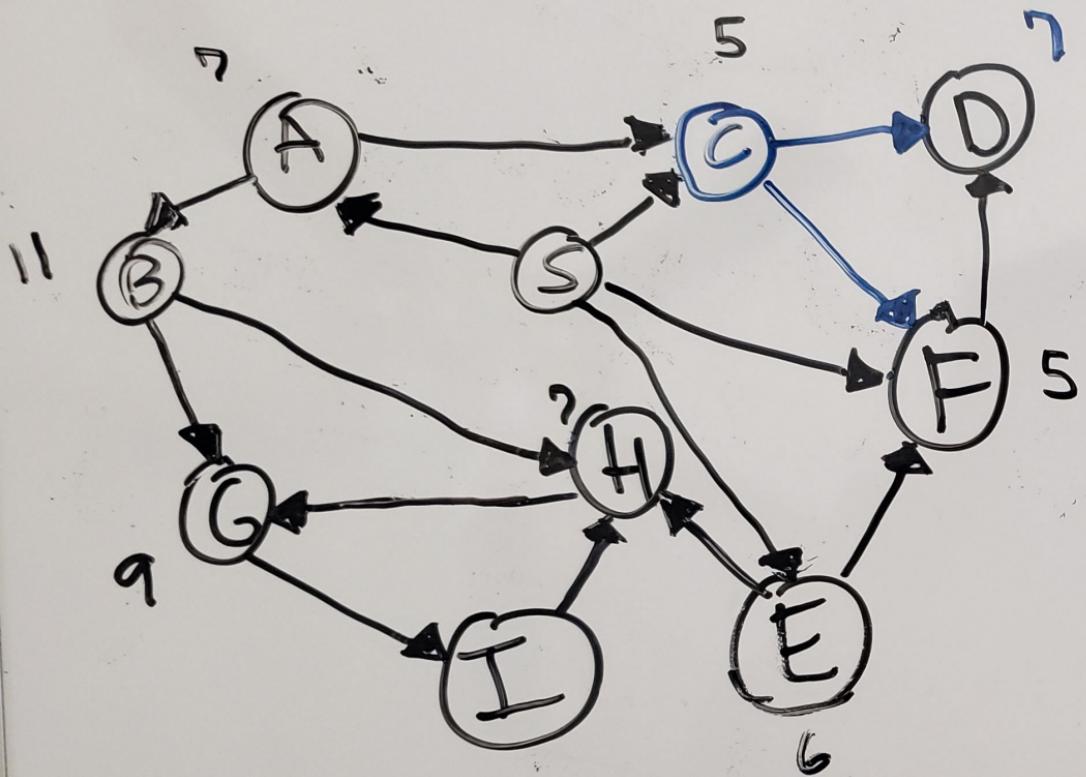
V	distTo[]	edgeTo[]
S	0.0	
A	7.0	0 → 1
B	11.0	1 → 2
C	5.0	1 → 3
D		
E	6.0	0 → 5
F	5.0	0 → 6
G		
H		
I		



Bellman - Ford

I, changed to
two H's in original →

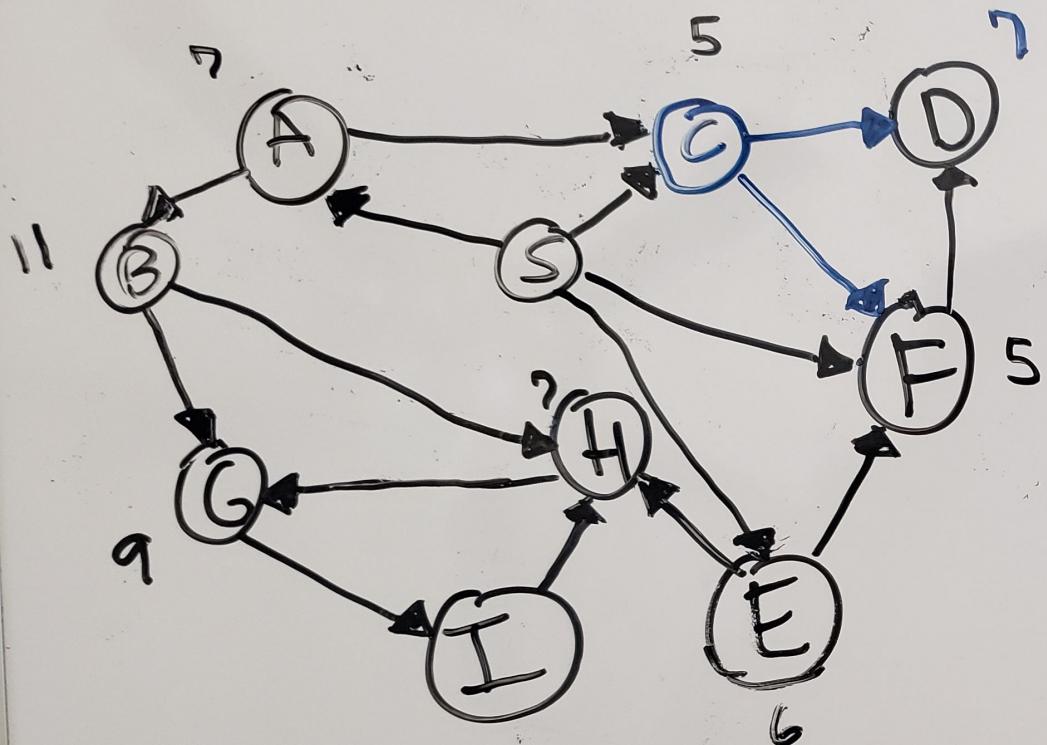
V	distTo[]	edgeTo[]
S	0.0	0 → 1
A	7.0	1 → 2
B	11.0	1 → 3
C	3.0	
D	4.0	
E	5.0	0 → 5
F	6.0	0 → 6
G	7.0	2 → 7
H	8.0	2 → 8
I	9.0	



Bellman - Ford

I₁^{changed to}
I₂^{two H's}
in original

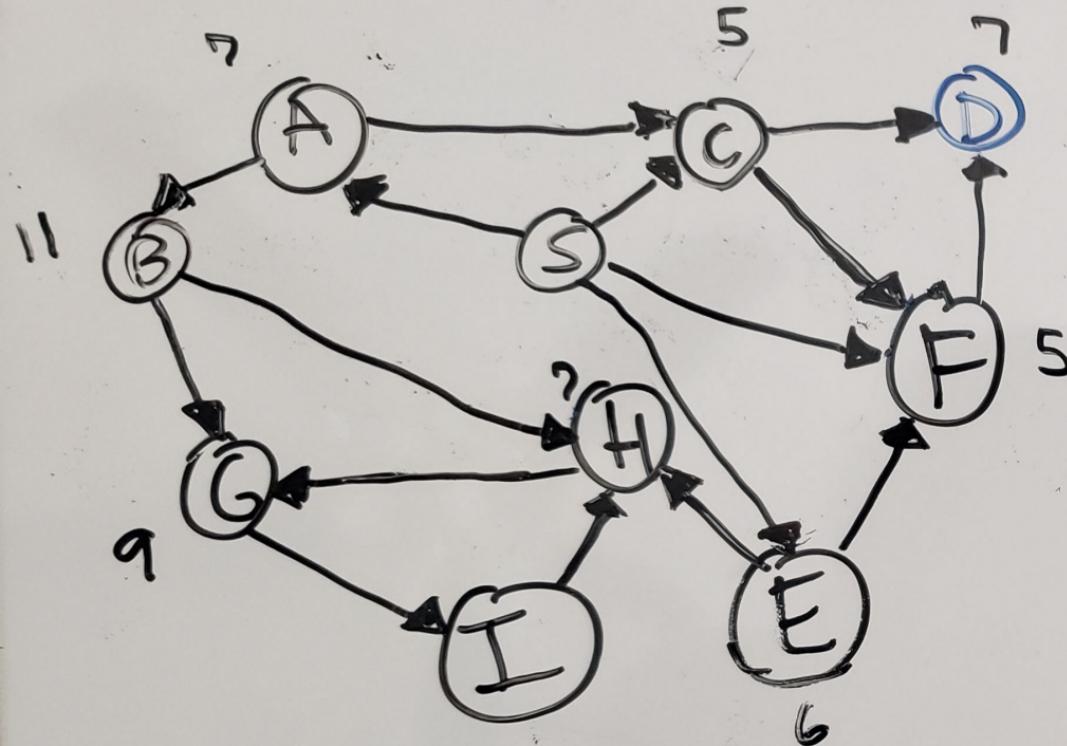
	V	distTo[]	edgeTo[]
S	0	0.0	
A	1	7.0	0 → 1
B	2	11.0	1 → 2
C	3	5.0	1 → 3
D	4	7.0	3 → 4
E	5	6.0	0 → 5
F	6	5.0	0 → 6
G	7	9.0	2 → 7
H	8	7.0	2 → 8
I	9		



Bellman - Ford

I, changed to
two H's
in original →

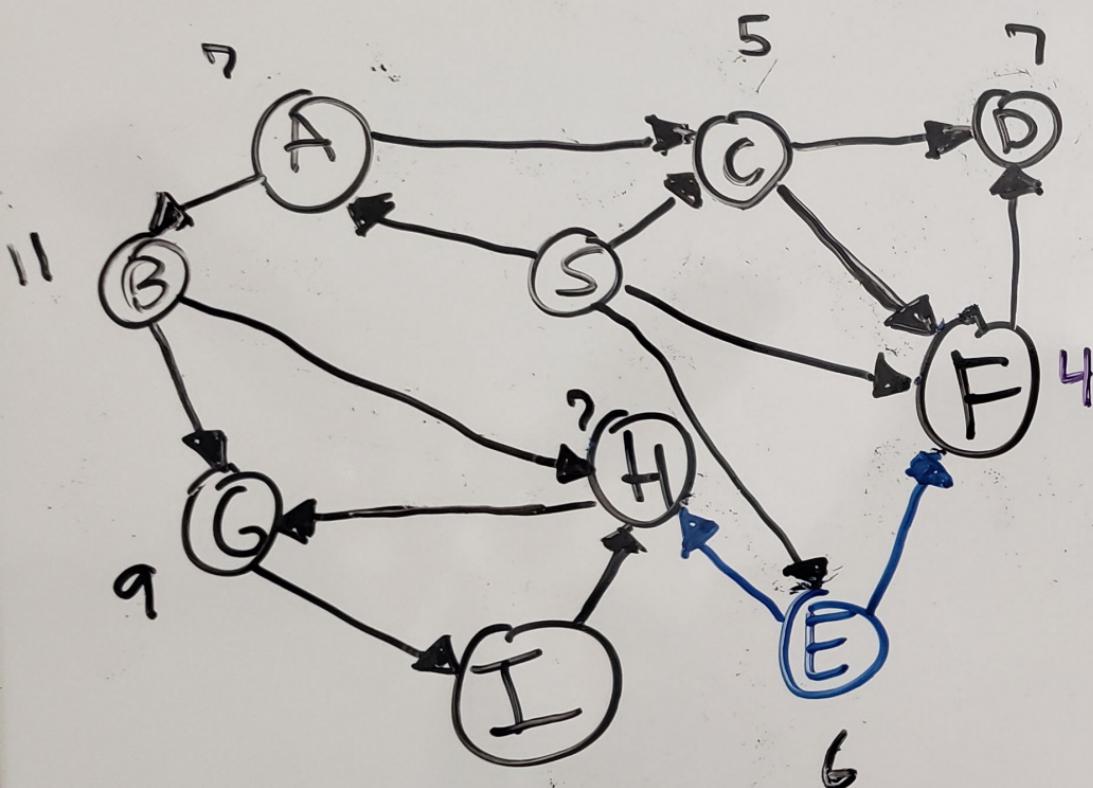
	distTo[]	edgeTo[]
S	0.0	0→1
A	7.0	1→2
B	11.0	1→3
C	5.0	3→4
D	7.0	0→5
E	6.0	0→6
F	5.0	2→7
G	9.0	2→8
H	7.0	
I	9.0	



Bellman - Ford

I, changed to
two H's
in original
→

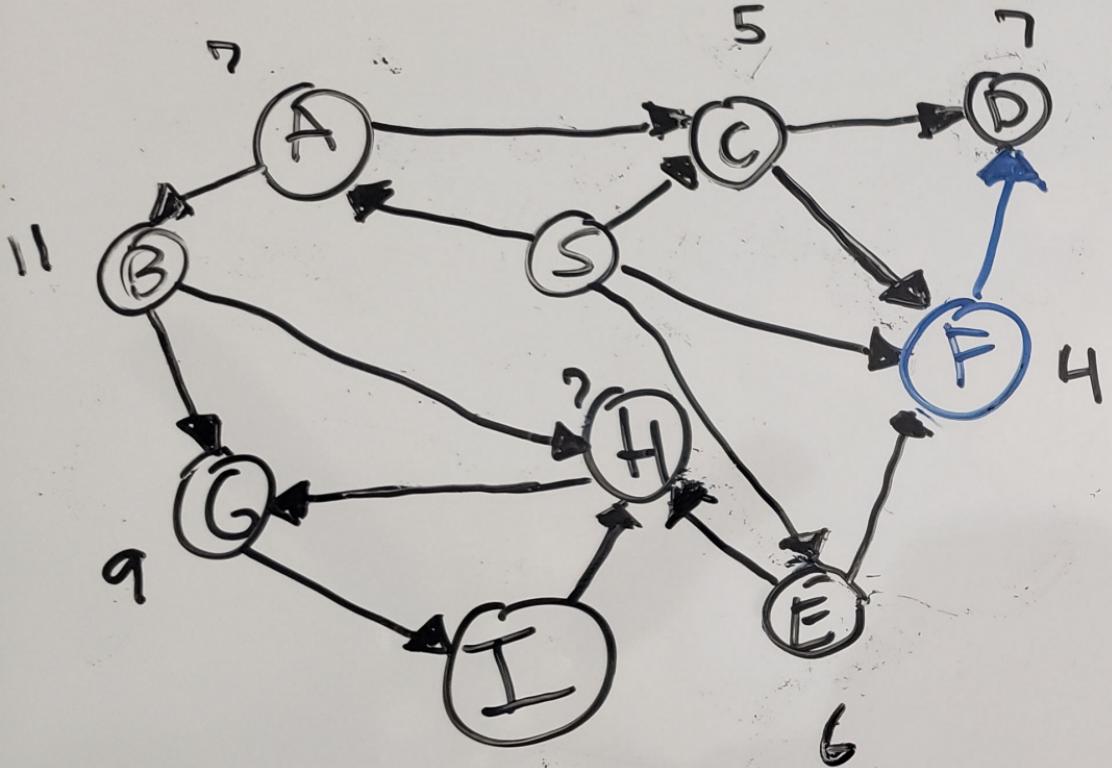
	V	distTo[]	edgeTo[]
S	0	0.0	
A	1	7.0	0→1
B	2	11.0	1→2
C	3	5.0	1→3
D	4	7.0	3→4
E	5	6.0	0→5
F	6	5.0	0→6
G	7	9.0	2→7
H	8	7.0	2→8
I	9		



Bellman - Ford

I₁<sup>changed to
two H's
in original</sup> →

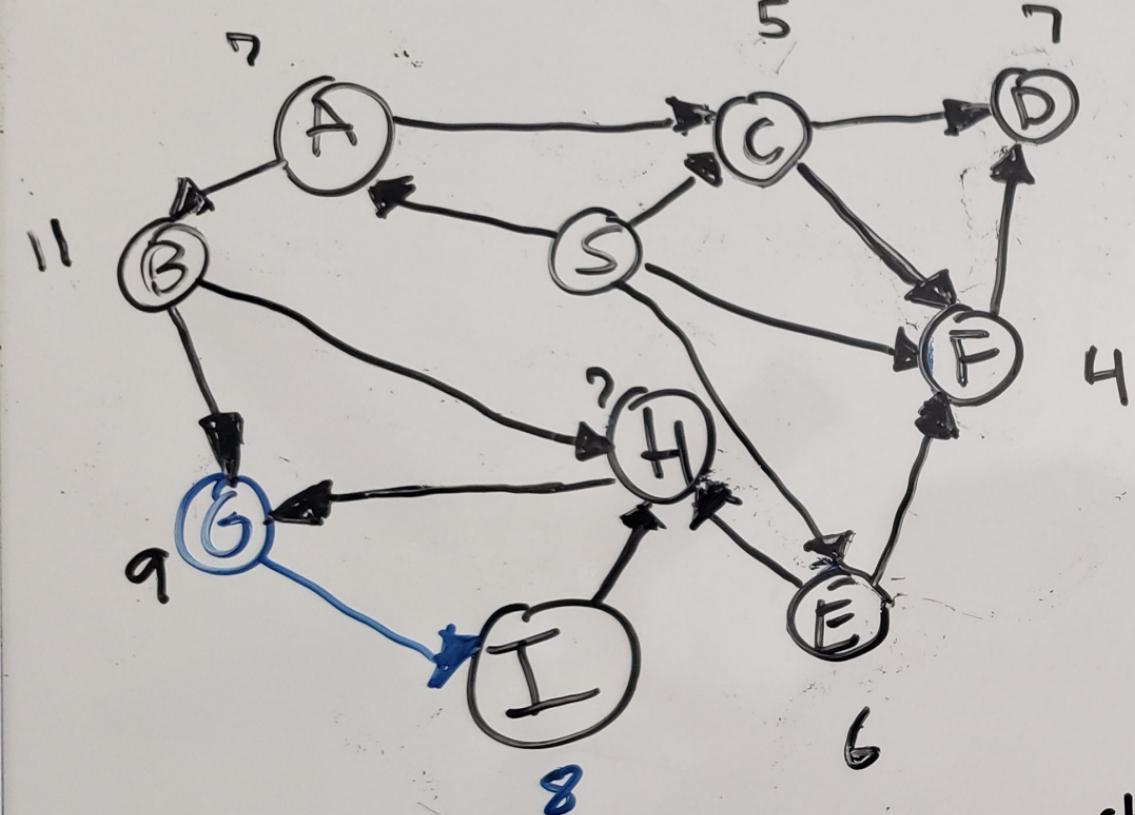
V	distTo[]	edgeTo[]
S	0.0	0→1
A	7.0	1→2
B	11.0	1→3
C	5.0	3→4
D	7.0	0→5
E	6.0	5→6
F	4.0	2→7
G	9.0	2→8
H	7.0	
I	9	



Bellman - Ford

I changed to
two H's
in original
→

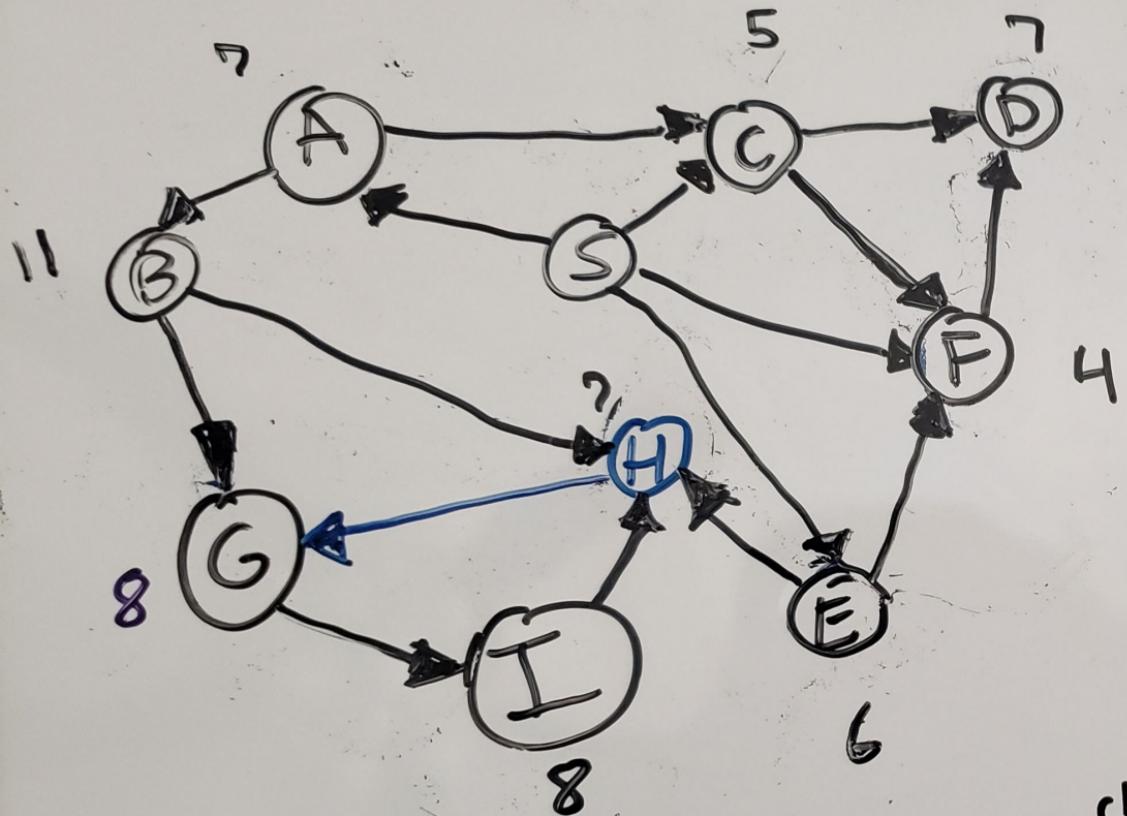
	V	distTo[]	edgeTo[]
S	0	0.0	0 → 1
A	1	7.0	1 → 2
B	2	11.0	1 → 3
C	3	5.0	3 → 4
D	4	7.0	0 → 5
E	5	6.0	5 → 6
F	6	4.0	2 → 7
G	7	9.0	2 → 8
H	8	7.0	
I	9		



Bellman - Ford

I changed to
two H's in original
→

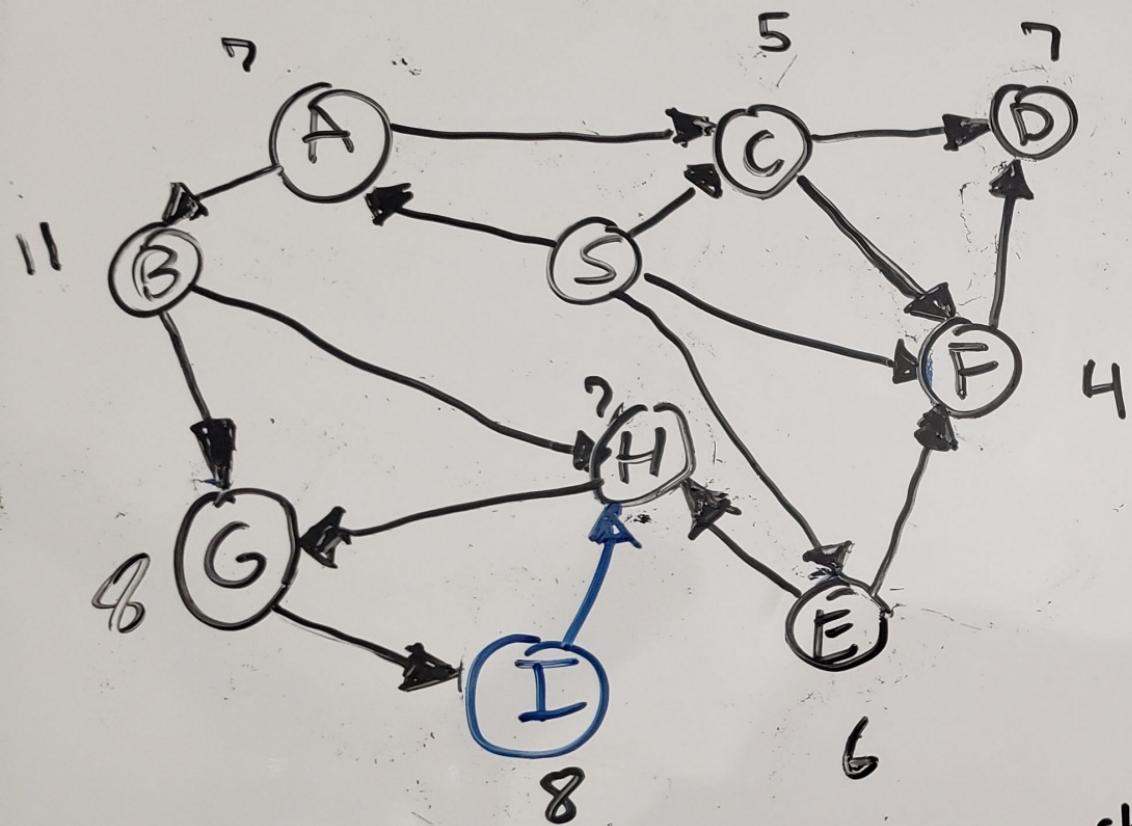
	v	distTo[]	edgeTo[]
S	0	0.0	0 → 1
A	1	7.0	1 → 2
B	2	11.0	1 → 3
C	3	5.0	3 → 4
D	4	7.0	0 → 5
E	5	6.0	5 → 6
F	6	4.0	2 → 7
G	7	9.0	2 → 8
H	8	7.0	7 → 9
I	9	8.0	



Bellman - Ford

I changed to
I, two H's
in original →

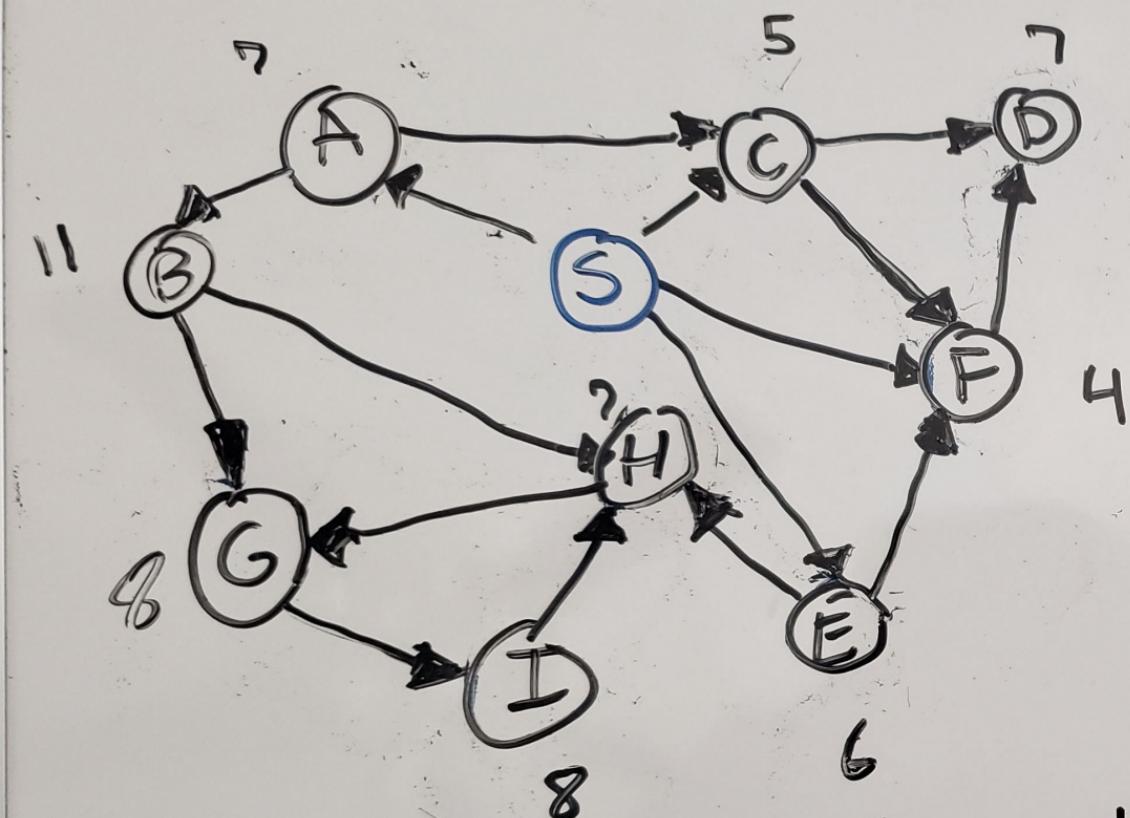
V	distTo[]	edgeTo[]
S	0.0	
A	7.0	0 → 1
B	11.0	1 → 2
C	5.0	2 → 3
D	7.0	3 → 4
E	6.0	0 → 5
F	4.0	5 → 6
G	8.0	8 → 7
H	7.0	2 → 8
I	8.0	7 → 9



Bellman - Ford

I changed to
two H's in original
→

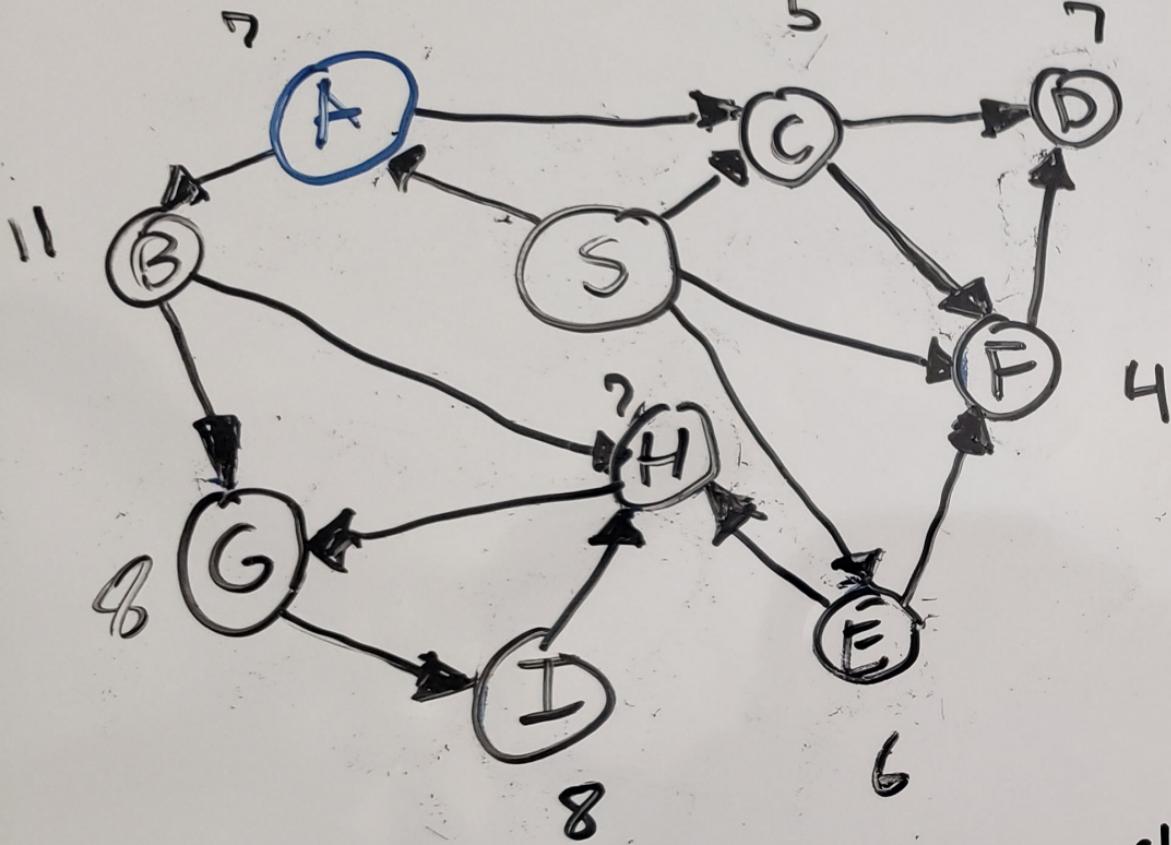
V	distTo[]	edgeTo[]
S	0.0	
A	7.0	0 → 1
B	11.0	1 → 2
C	5.0	1 → 3
D	7.0	3 → 4
E	6.0	0 → 5
F	4.0	5 → 6
G	8.0	8 → 7
H	7.0	2 → 8
I	8.0	7 → 9



Bellman - Ford

I changed to
two H's in original
→

V	distTo[]	edgeTo[]
S	0.0	0→1
A	7.0	1→2
B	11.0	1→3
C	5.0	3→4
D	7.0	0→5
E	6.0	5→6
F	4.0	8→7
G	8.0	2→8
H	7.0	7→9
I	8.0	

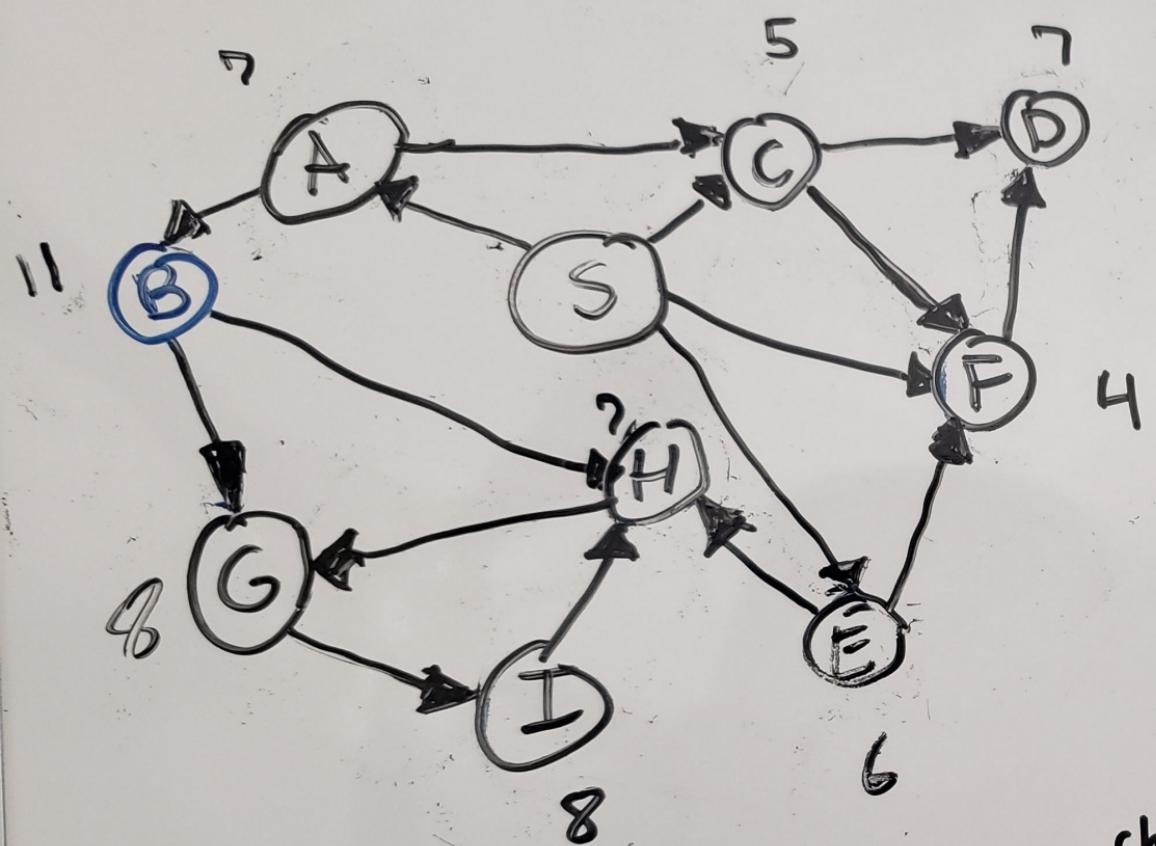


Bellman - Ford

I₁ changed to
I₂ two H's
in original

→

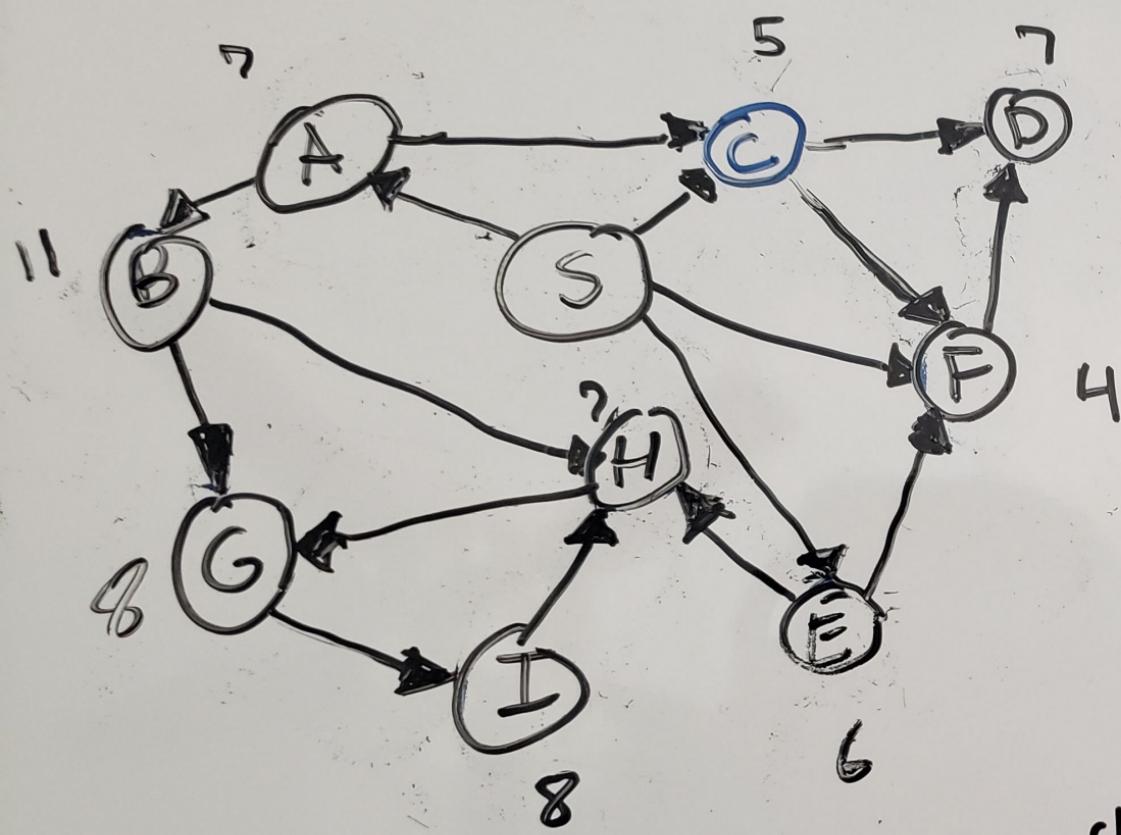
V	distTo[]	edgeTo[]
S	0.0	
A	7.0	0 → 1
B	11.0	1 → 2
C	5.0	1 → 3
D	7.0	3 → 4
E	6.0	0 → 5
F	4.0	5 → 6
G	8.0	8 → 7
H	7.0	2 → 8
I	8.0	7 → 9



Bellman - Ford

I, two H's
in original
→
I changed to

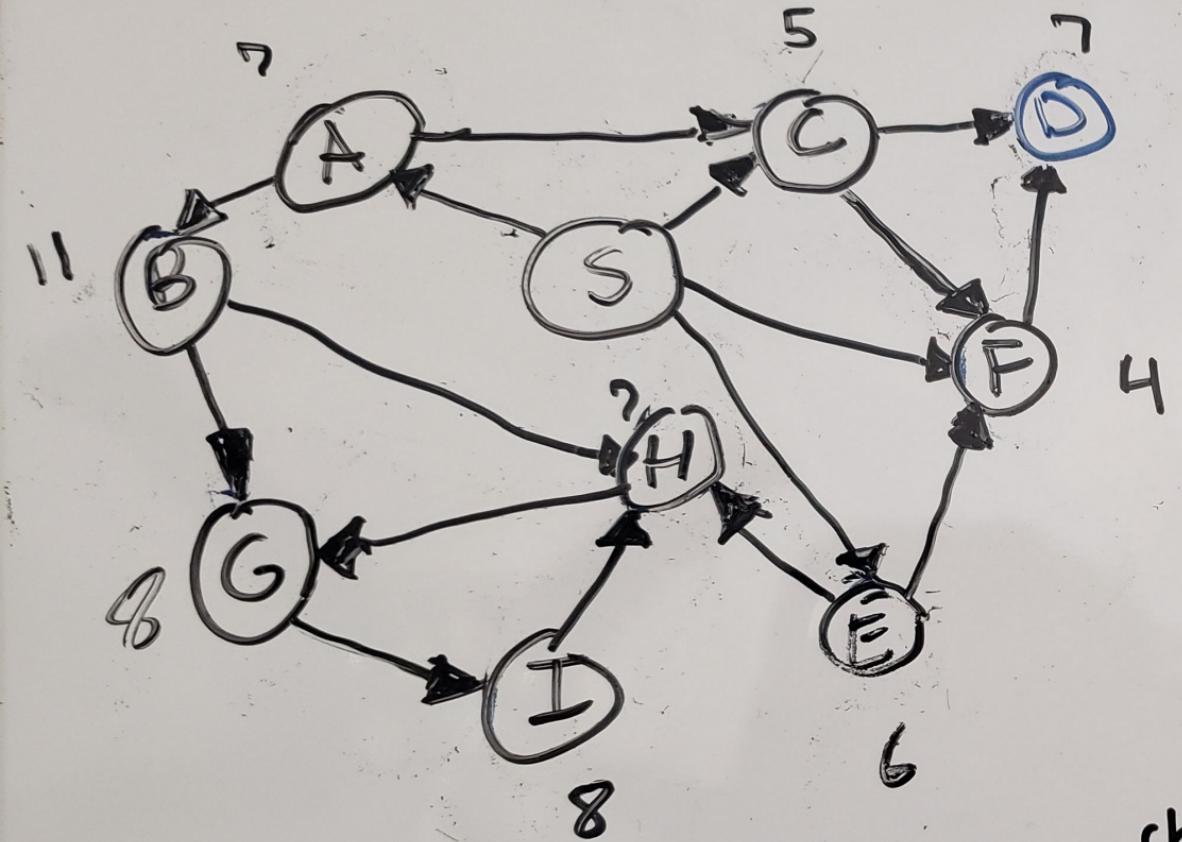
	v	distTo[]	edgeTo[]
S	0	0.0	0 → 1
A	1	7.0	1 → 2
B	2	11.0	1 → 3
C	3	5.0	3 → 4
D	4	7.0	0 → 5
E	5	6.0	5 → 6
F	6	4.0	8 → 7
G	7	8.0	2 → 8
H	8	7.0	7 → 9
I	9	8.0	



Bellman - Ford

I, changed to
two H's in original →

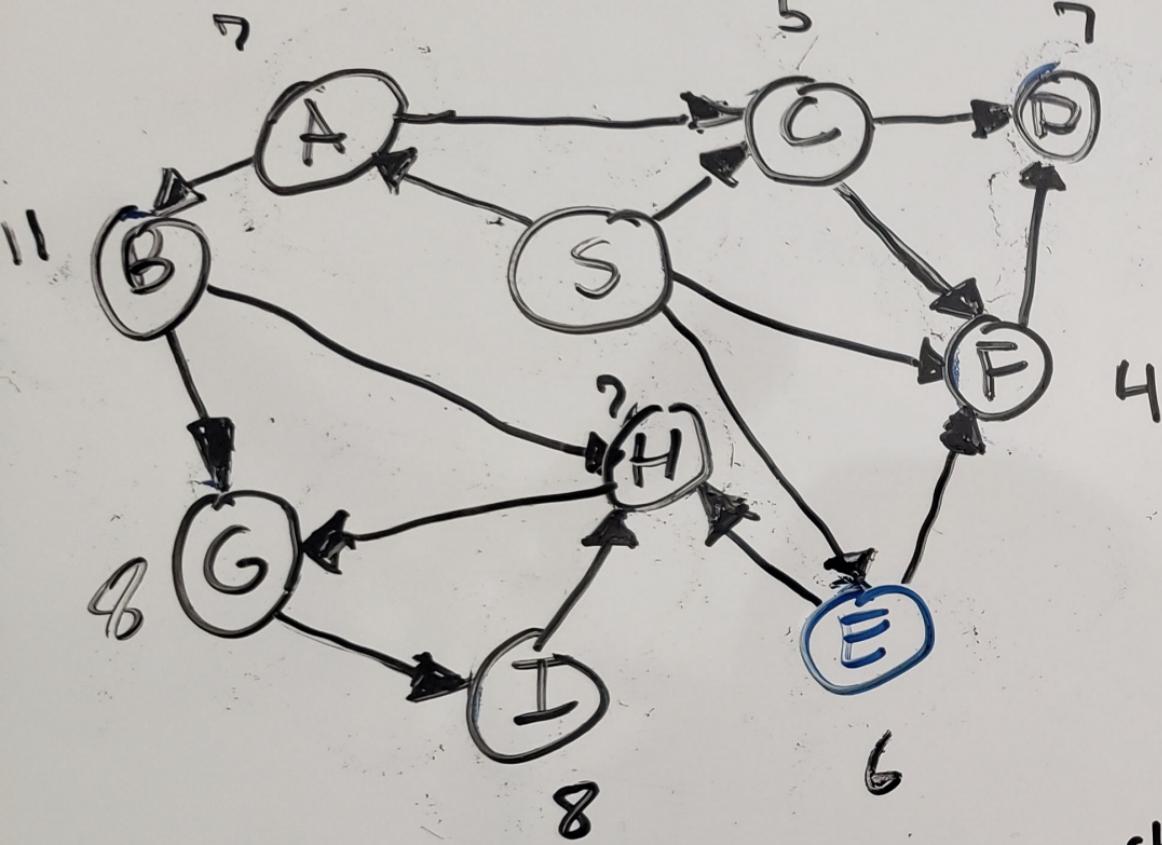
V	distTo[]	edgeTo[]
S	0.0	0→1
A	7.0	1→2
B	11.0	1→3
C	5.0	3→4
D	7.0	0→5
E	6.0	5→6
F	4.0	8→7
G	8.0	2→8
H	7.0	7→9
I	8.0	



Bellman - Ford

I₁, two H's
in original
→ I₁
changed to

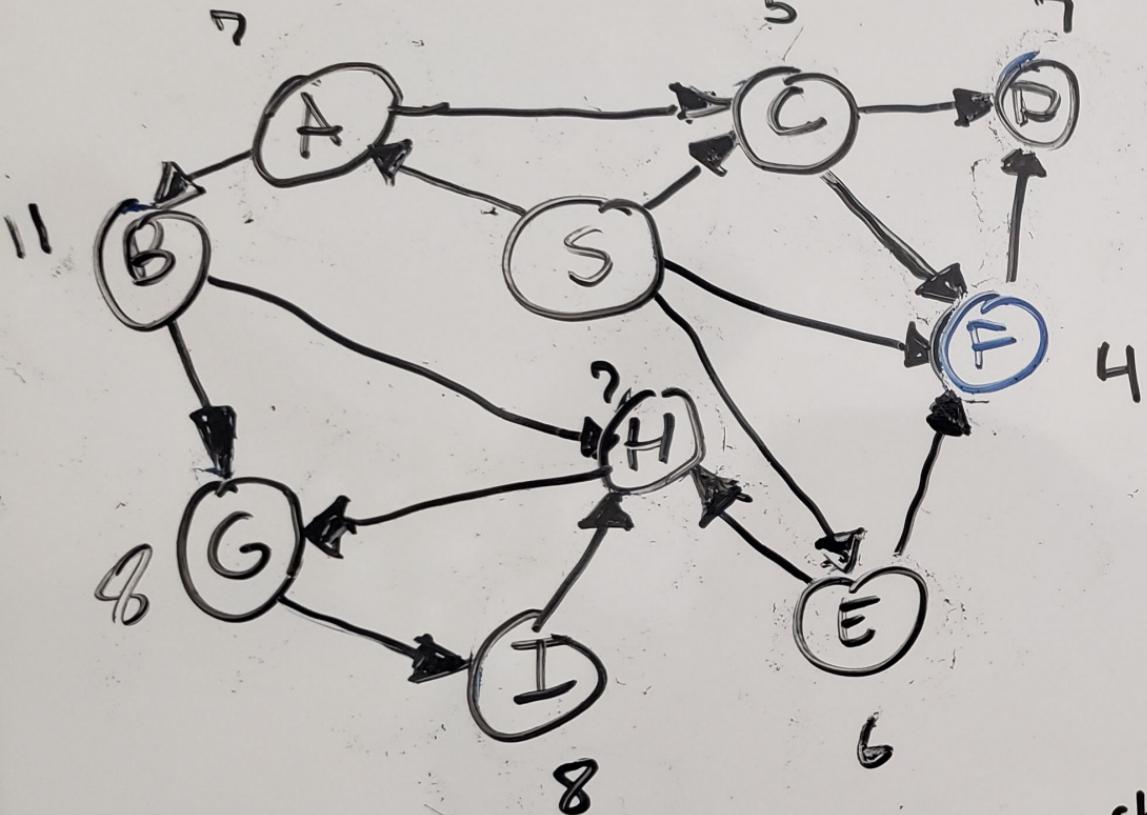
	distTo[]	edgeTo[]
S	0.0	0 → 1
A	7.0	1 → 2
B	11.0	1 → 3
C	5.0	3 → 4
D	7.0	0 → 5
E	5	5 → 6
F	6.0	8 → 7
G	8.0	2 → 8
H	7.0	7 → 9
I ₁	8.0	



Bellman - Ford

I₁^{changed to}
I₁^{two H's}
in original

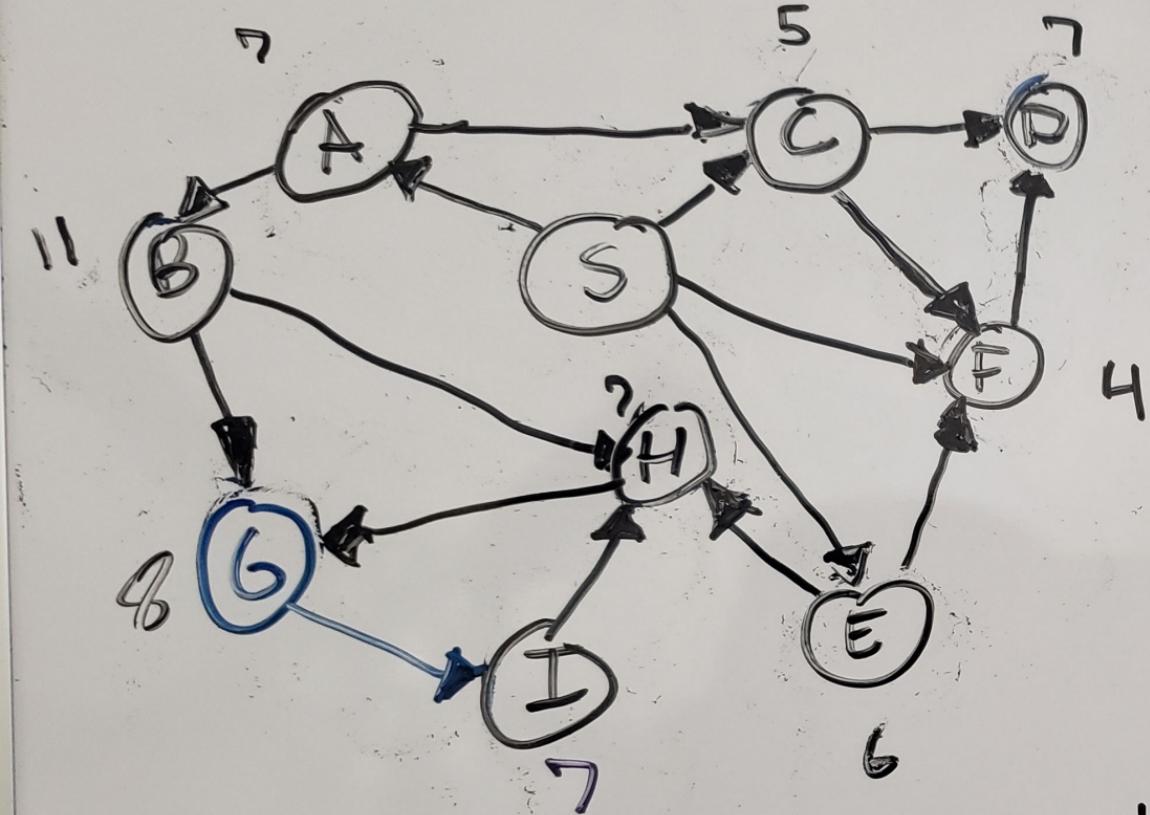
V	distTo[]	edgeTo[]
S	0.0	
A	7.0	0→1
B	11.0	1→2
C	5.0	1→3
D	7.0	3→4
E	6.0	0→5
F	4.0	5→6
G	8.0	8→7
H	7.0	2→8
I	8.0	7→9



Bellman - Ford

I, changed to
two H's
in original
→ I

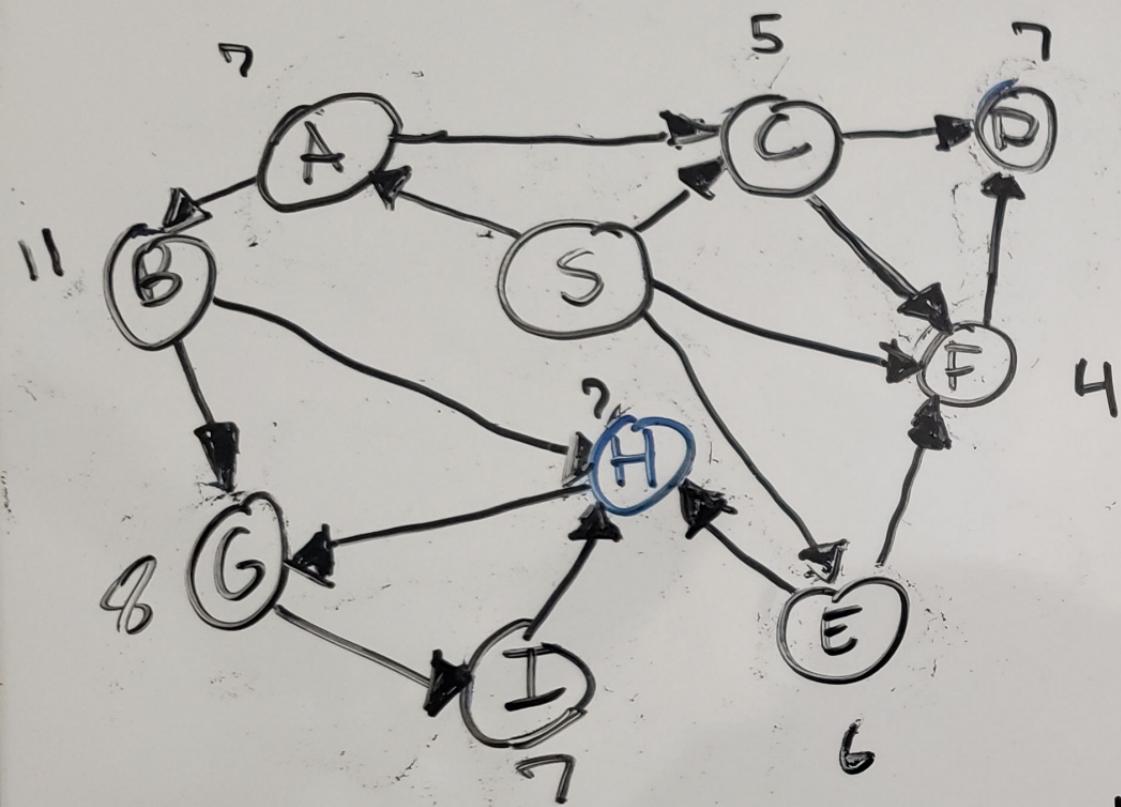
V	distTo[]	edgeTo[]
S	0.0	0 → 1
A	7.0	1 → 2
B	11.0	1 → 3
C	5.0	3 → 4
D	7.0	0 → 5
E	6.0	5 → 6
F	4.0	8 → 7
G	8.0	2 → 8
H	7.0	7 → 9
I	8.0	



Bellman - Ford

I, changed to
two H's
in original
→

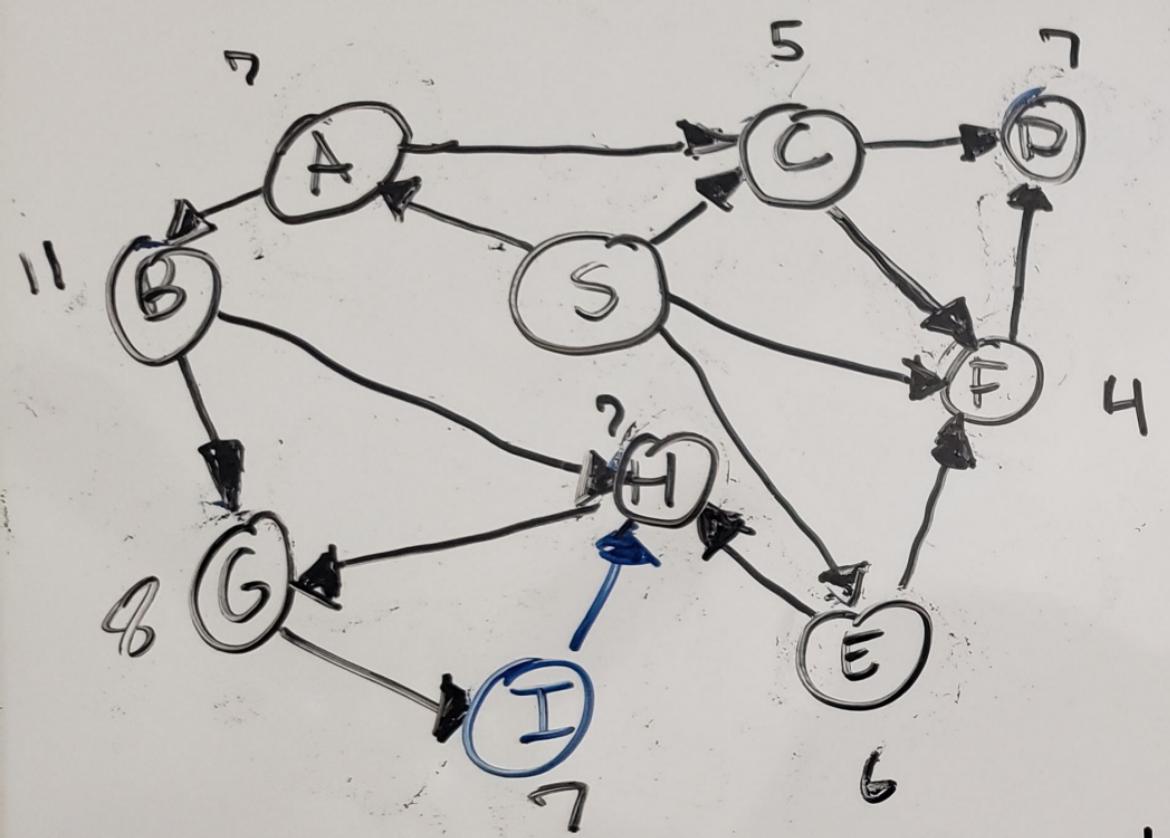
V	distTo[]	edgeTo[]
S	0.0	0 → 1
A	7.0	1 → 2
B	11.0	1 → 3
C	5.0	3 → 4
D	7.0	
E	6.0	0 → 5
F	4.0	5 → 6
G	8.0	8 → 7
H	7.0	2 → 8
I	7.0	7 → 9



Bellman - Ford

I changed to
two H's
in original →

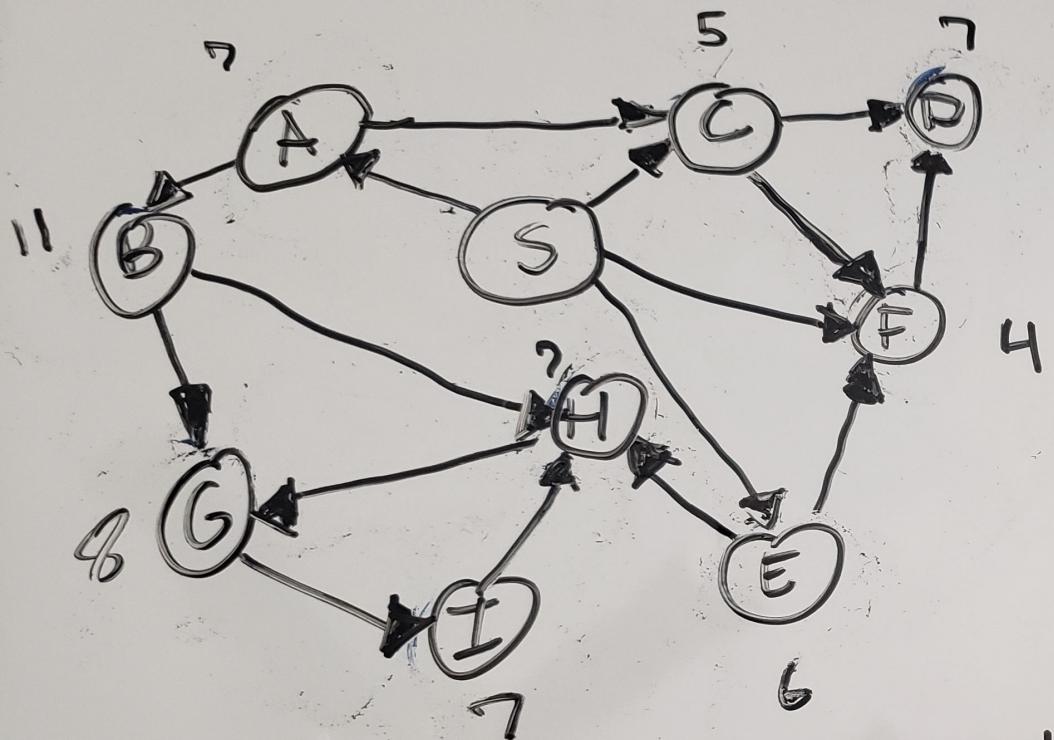
V	distTo[]	edgeTo[]
S	0.0	
A	7.0	0→1
B	11.0	1→2
C	5.0	1→3
D	7.0	3→4
E	6.0	0→5
F	4.0	5→6
G	8.0	8→7
H	7.0	2→8
I	7.0	7→9



Bellman - Ford

I, two H's
in original
→ I changed to

V	distTo[]	edgeTo[]
S	0.0	
A	7.0	0 → 1
B	11.0	1 → 2
C	5.0	1 → 3
D	7.0	3 → 4
E	5.0	0 → 5
F	4.0	5 → 6
G	8.0	8 → 7
H	7.0	2 → 8
I	7.0	7 → 9

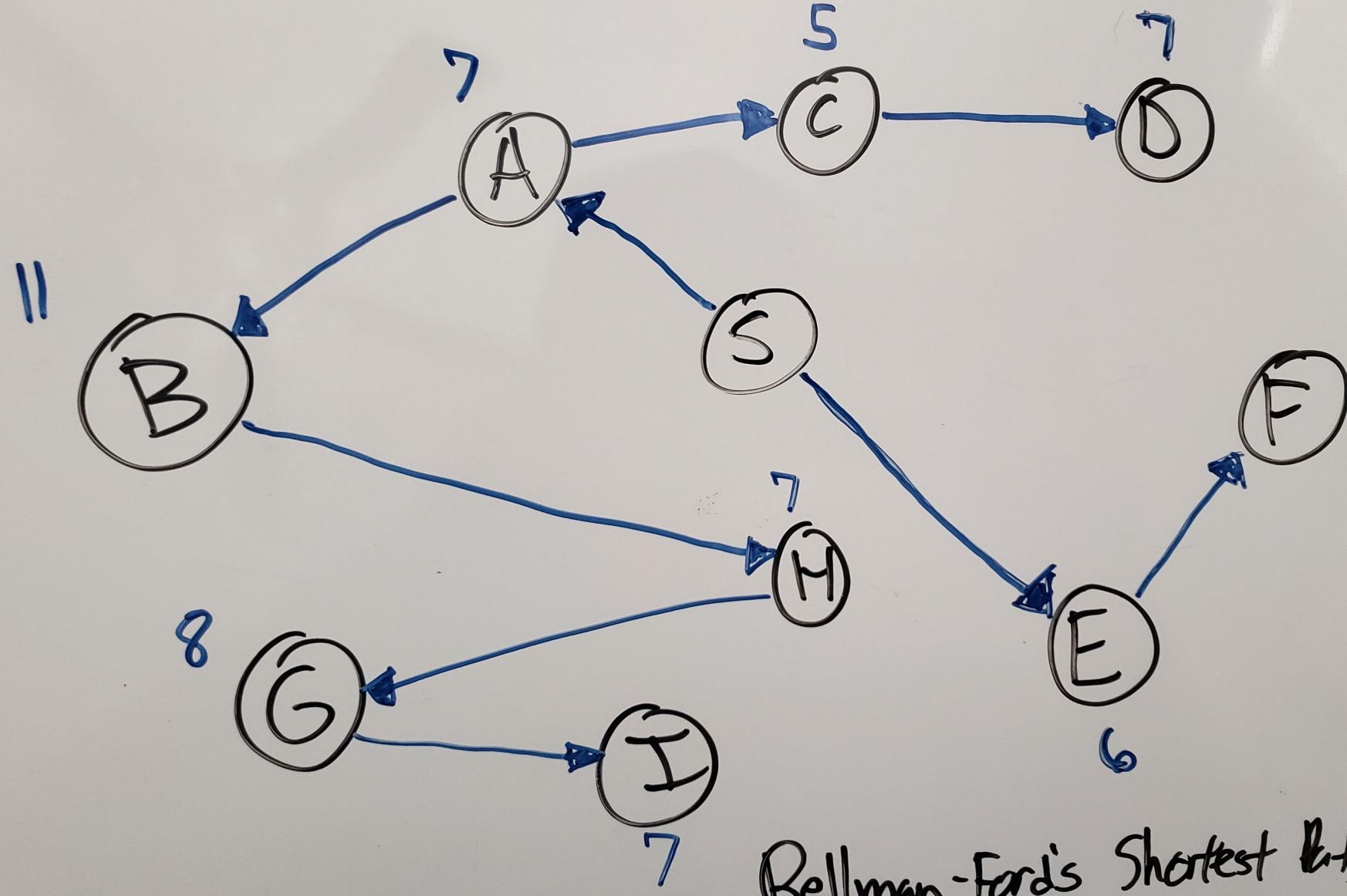


Bellman - Ford

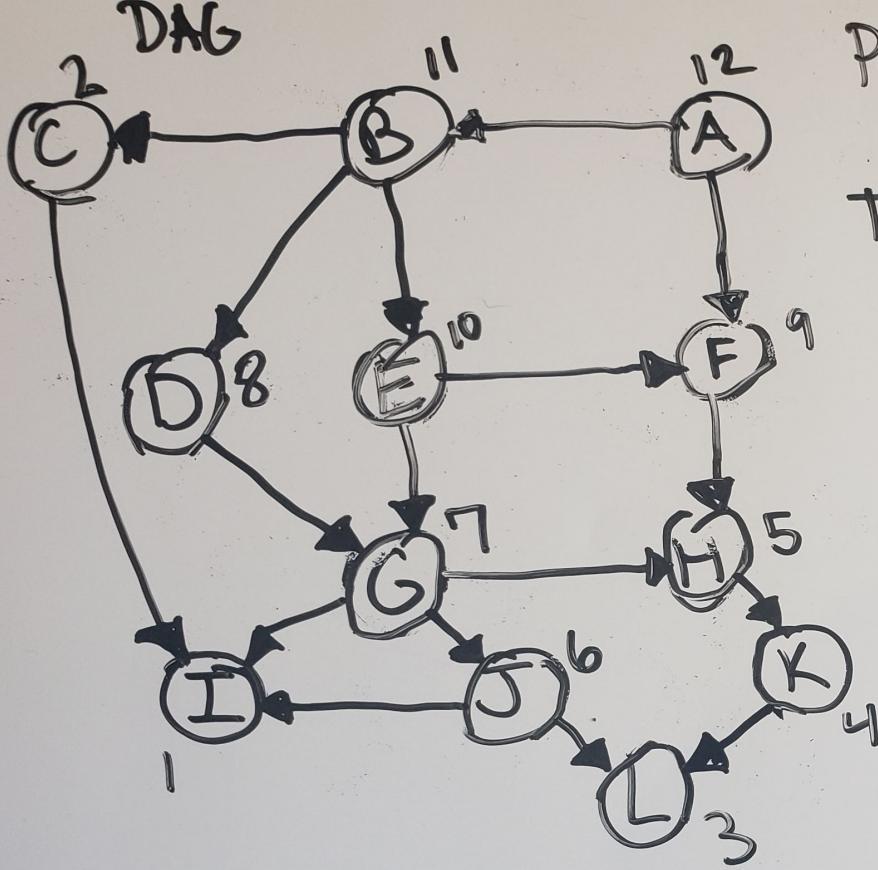
I₁ ^{changed to}
two H's
in original

Further passes do not
change the values

V	distTo[]	edgeTo[]
S	0.0	
A	7.0	0 → 1
B	11.0	1 → 2
C	5.0	1 → 3
D	7.0	3 → 4
E	6.0	0 → 5
F	4.0	5 → 6
G	8.0	8 → 7
H	7.0	2 → 8
I	7.0	7 → 9



Bellman-Ford's Shortest Paths & Costs



Postorder:

I C L K H J G D F E B A

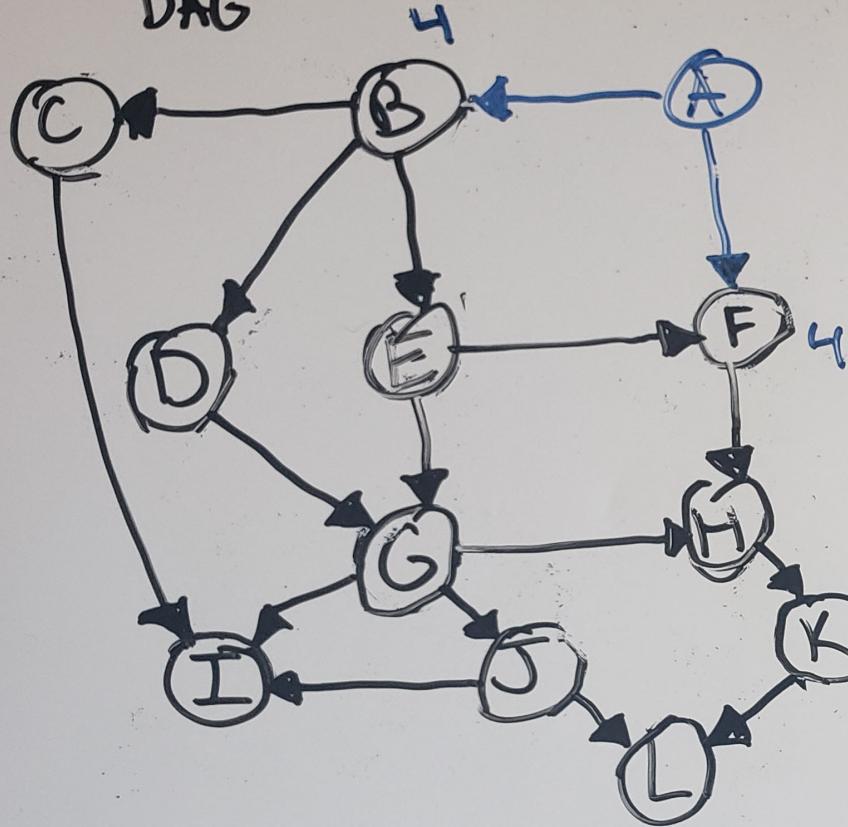
Topological Order:

A B E F D G J H K L C I

Shortest Path on DAG

V	distTo[]	edgeTo[]
O	0	
I	1	
L	2	
C	3	
G	4	
E	5	
F	6	
H	7	
J	8	
K	9	
A	10	
B	11	

DAG



Postorder:

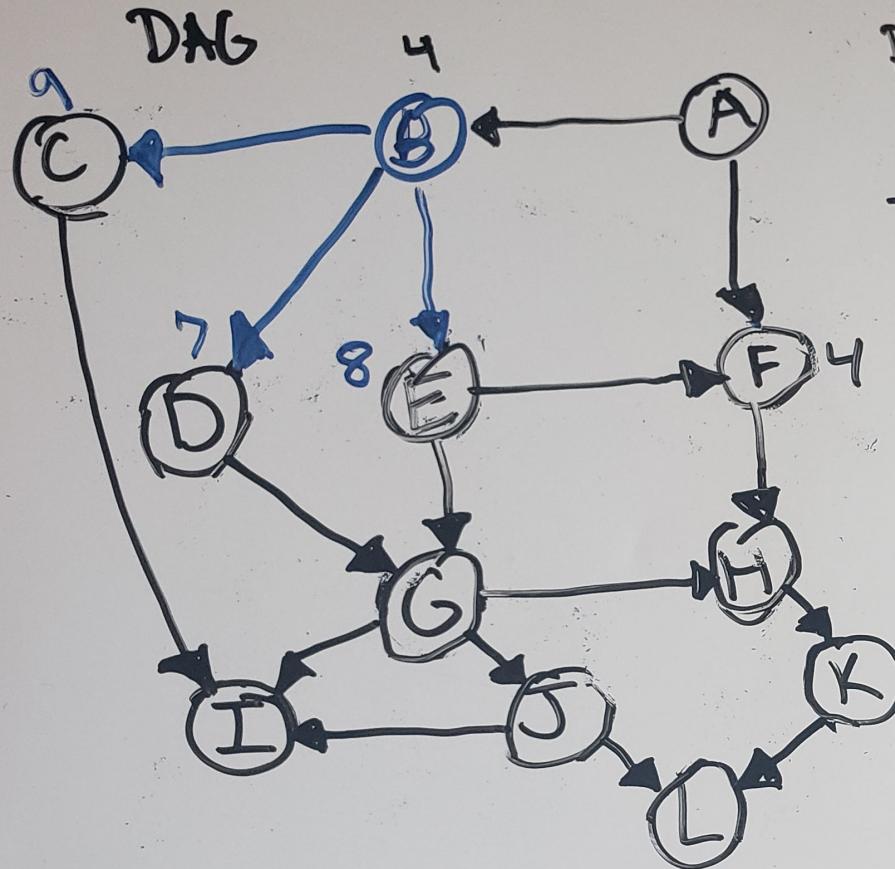
I C L K H J G D F E B A

Topological Order:

A B E F D G J H K L C I

Shortest Path on
DAG

	v	distTo[]	edgeTo[]
→ A	0	0	0
B	1	4	4
C	2		
D	3		
E	4		
F	5		
G	6		
H	7		
I	8		
J	9		
K	10		
L	11		



Postorder:

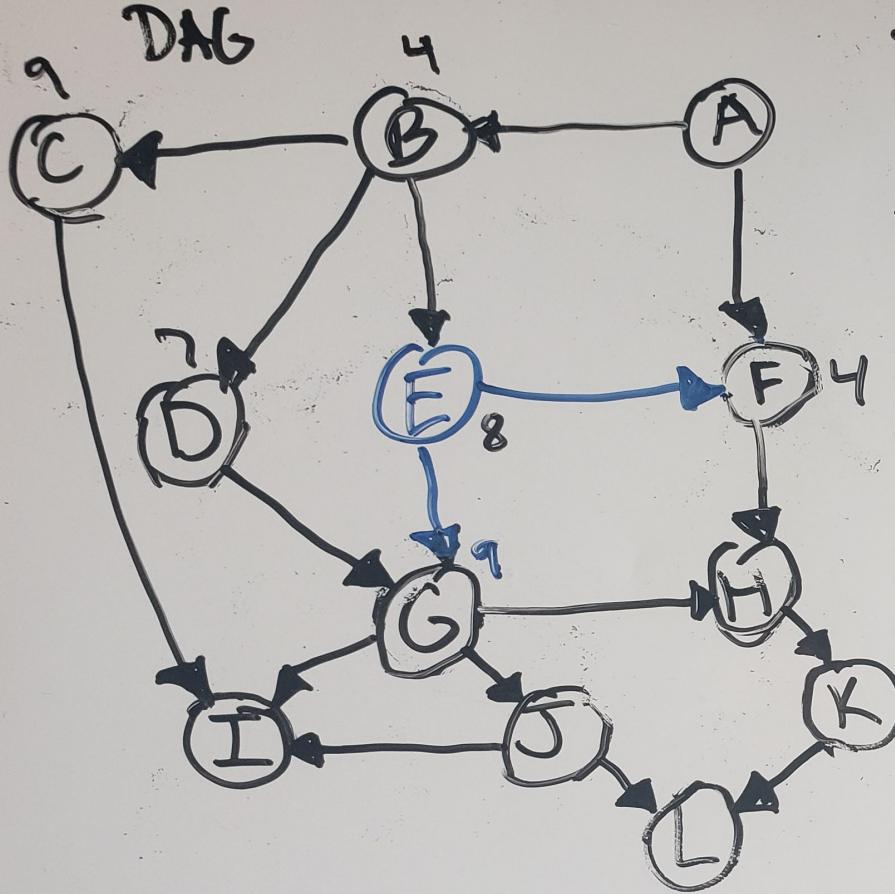
I C L K H J G D F E B A

Topological Order:

A B E F D G J H K L C I

Shortest Path on DAG

	distTo[]	edgeTo[]
V	0	0
A	4	1
B	9	2
C	7	3
D	8	4
E	4	5
F	5	6
G	6	7
H	7	8
I	8	9
J	9	10
K	10	11
L	11	



Postorder:

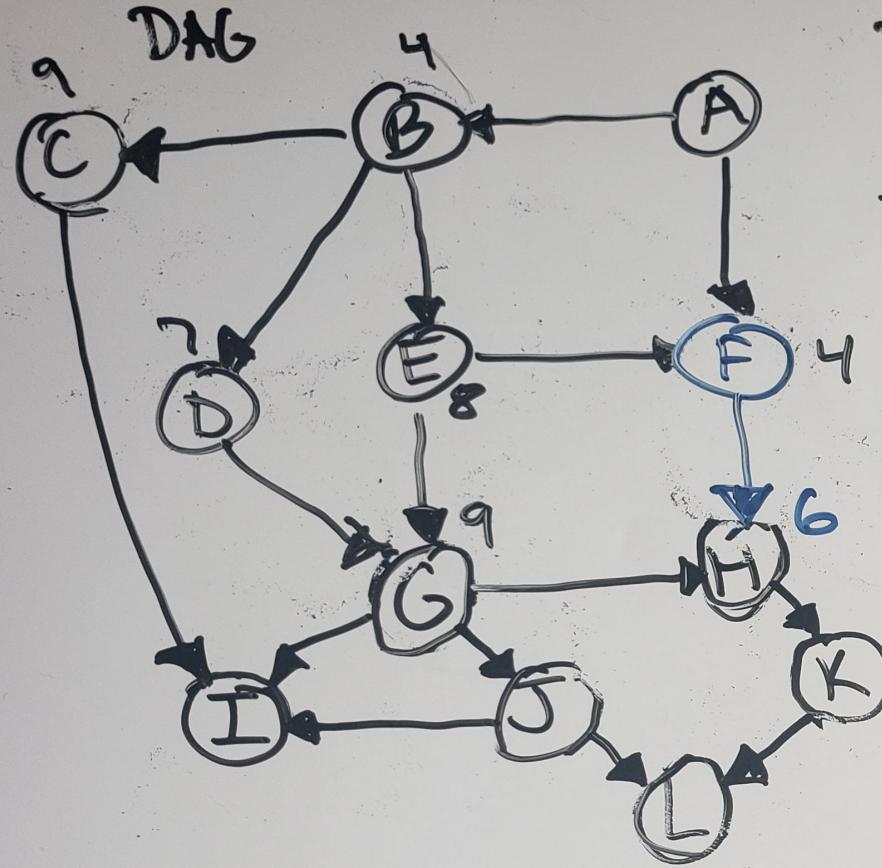
I C L K H J G D F E B A

Topological Order:

A B E F D G J H K L C I

Shortest Path on DAG

V	distTo[]	edgeTo[]
A	0	0-1
B	1	1-2
C	2	1-3
D	3	1-4
E	4	0-5
F	5	4-6
G	6	
H	7	
I	8	
J	9	
K	10	
L	11	



Postorder:

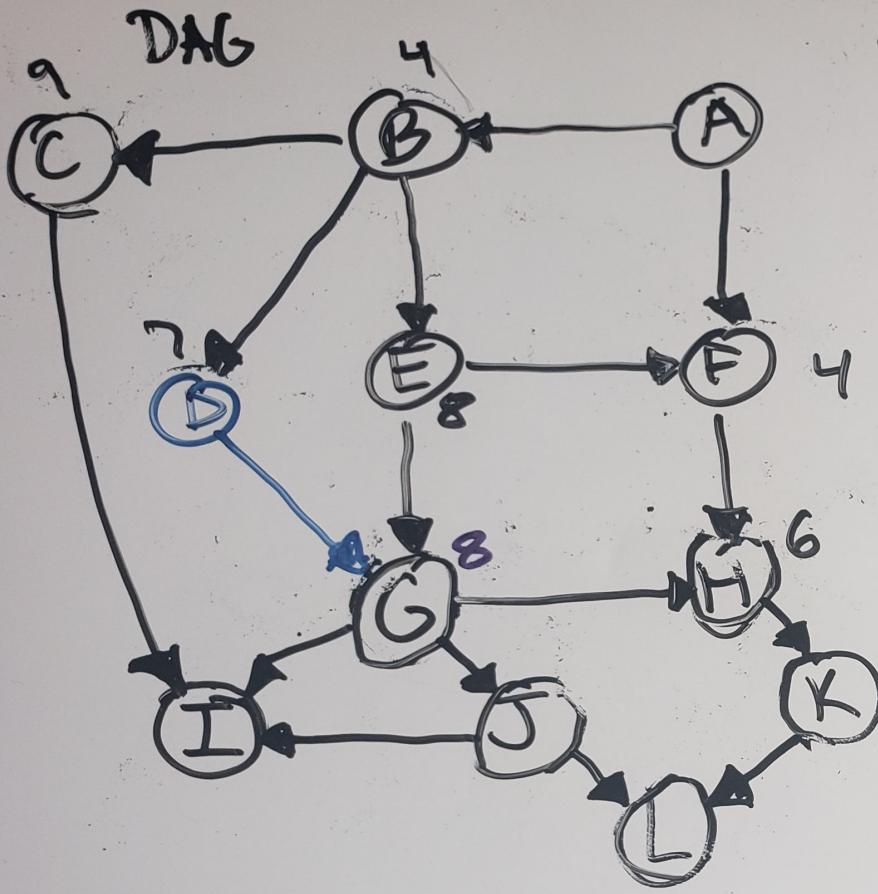
I C L K H J G D F E B A

Topological Order:

A B E F D G J H K L C I

Shortest Path on
DAG

	<u>distTo[]</u>	<u>edgeTo[]</u>
V	0	0
A	4	1
B	9	2
C	12	3
D	13	4
E	17	5
F	18	6
G	19	7
H	20	8
I	21	9
J	22	10
K	23	11
L	24	



Postorder:

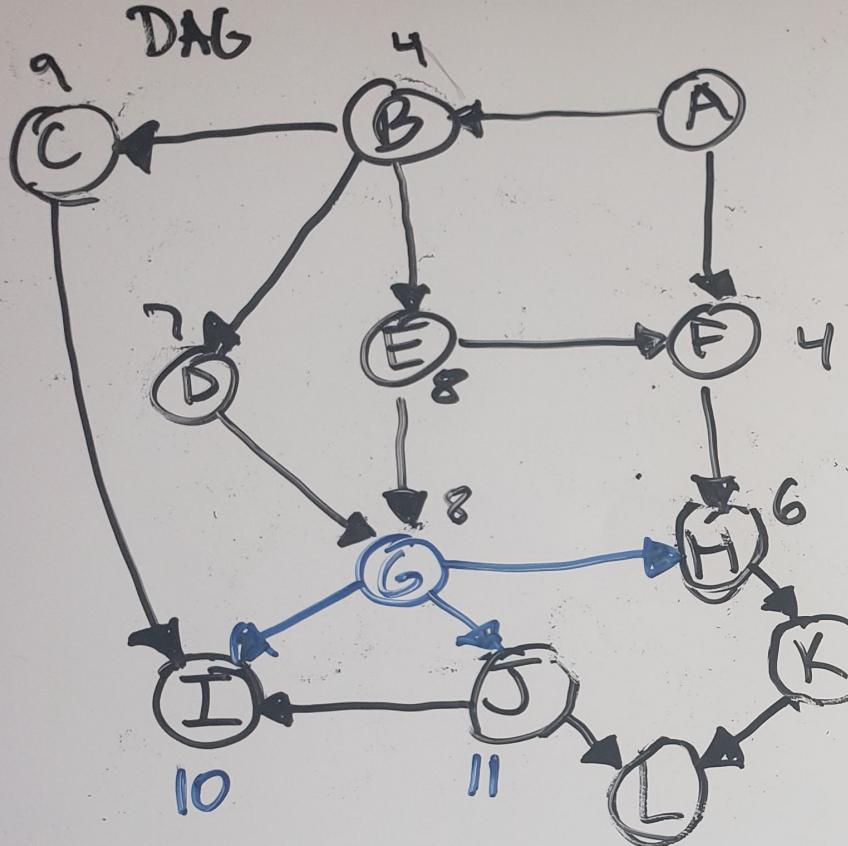
I C L K H J G D F E B A

Topological Order:

A B E F D G J H K L C I

Shortest Path on
DAG

	distTo[]	edgeTo[]
V	0	0 - 1
B	4	1 - 2
C	9	1 - 3
D	7	1 - 4
E	5	0 - 5
F	8	3 - 6
G	5	5 - 7
H	6	
I	4	
J	8	
K	9	
L	6	
	10	
	11	



Postorder:

I C L K H J G D F E B A

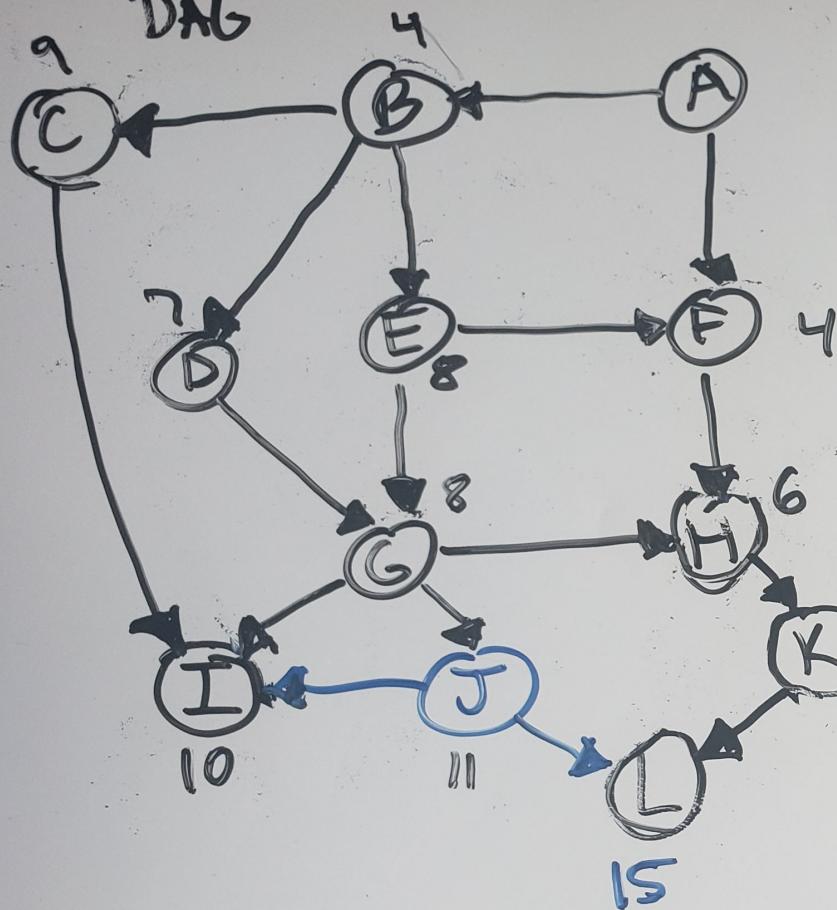
Topological Order:

A B E F D G J H K L C I

Shortest Path on DAG

V	distTo[]	edgeTo[]
A	0	0 - 1
B	1	1 - 2
C	2	1 - 3
D	3	1 - 4
E	4	0 - 5
F	5	3 - 6
G	6	5 - 7
H	7	6 - 8
I	8	6 - 9
J	9	
K	10	
L	11	

DAG



Postorder:

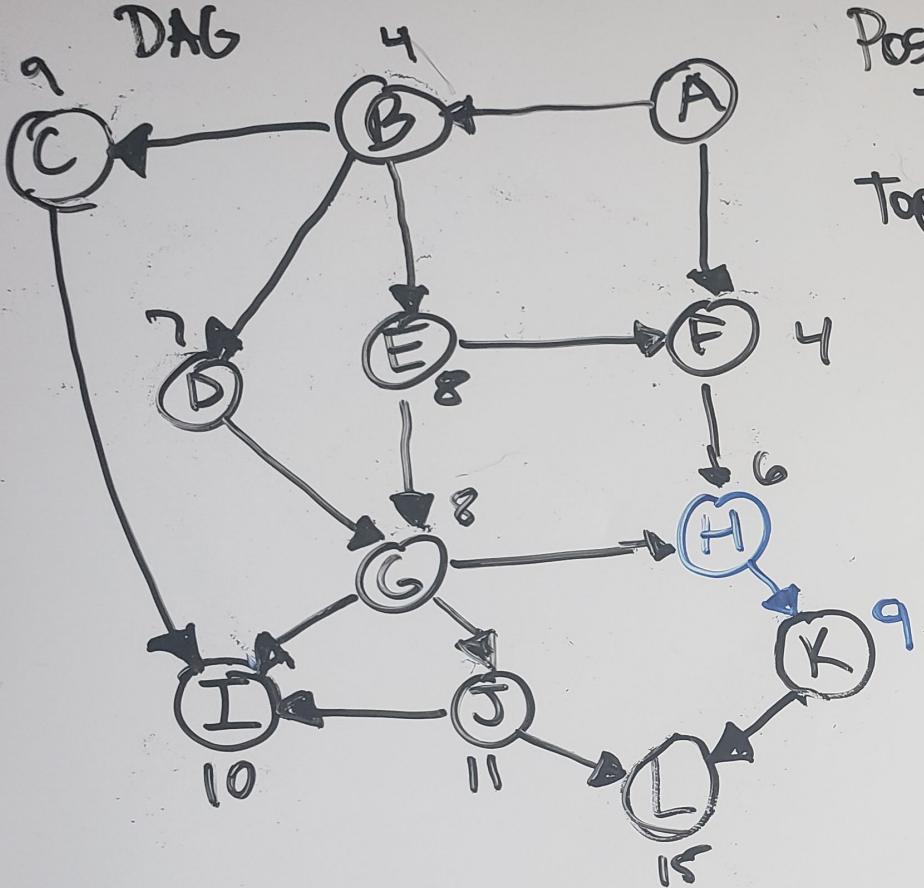
I C L K H J G D F E B A

Topological Order:

A B E F D G J H K L C I

Shortest Path on DAG

V	distTo[]	edgeTo[]
0	0	0-1
1	4	1-2
2	9	1-3
3	7	1-4
4	8	0-5
5	5	3-6
6	6	5-7
7	7	6-8
8	4	6-9
9	8	9-11
10	6	
11	10	
12	11	
13	15	



Postorder:

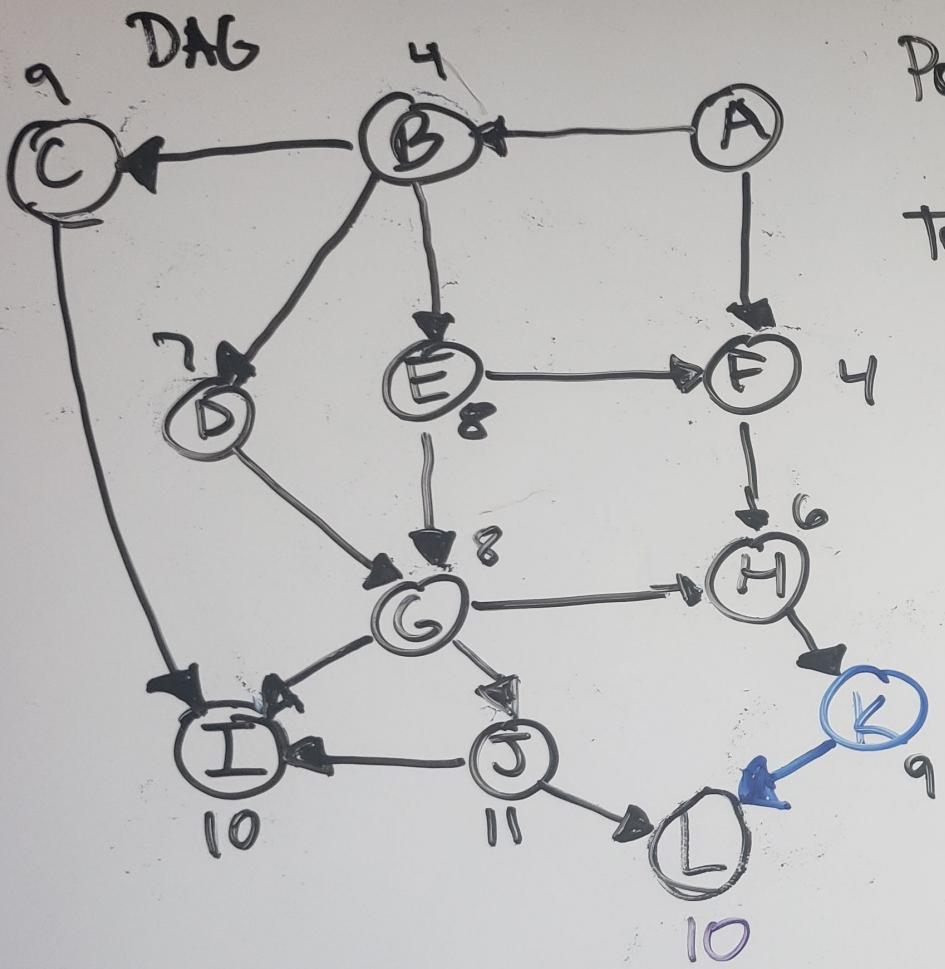
I C L K H J G D F E B A

Topological Order:

A B E F D G J H K L C I

Shortest Path on
DAG

V	distTo[]	edgeTo[]
0	0	0-1
1	4	1-2
2	9	1-3
3	7	1-4
4	5	0-5
5	4	3-6
6	8	5-7
7	6	6-8
8	10	6-9
9	11	7-10
10	9	9-11
11	15	



Postorder:

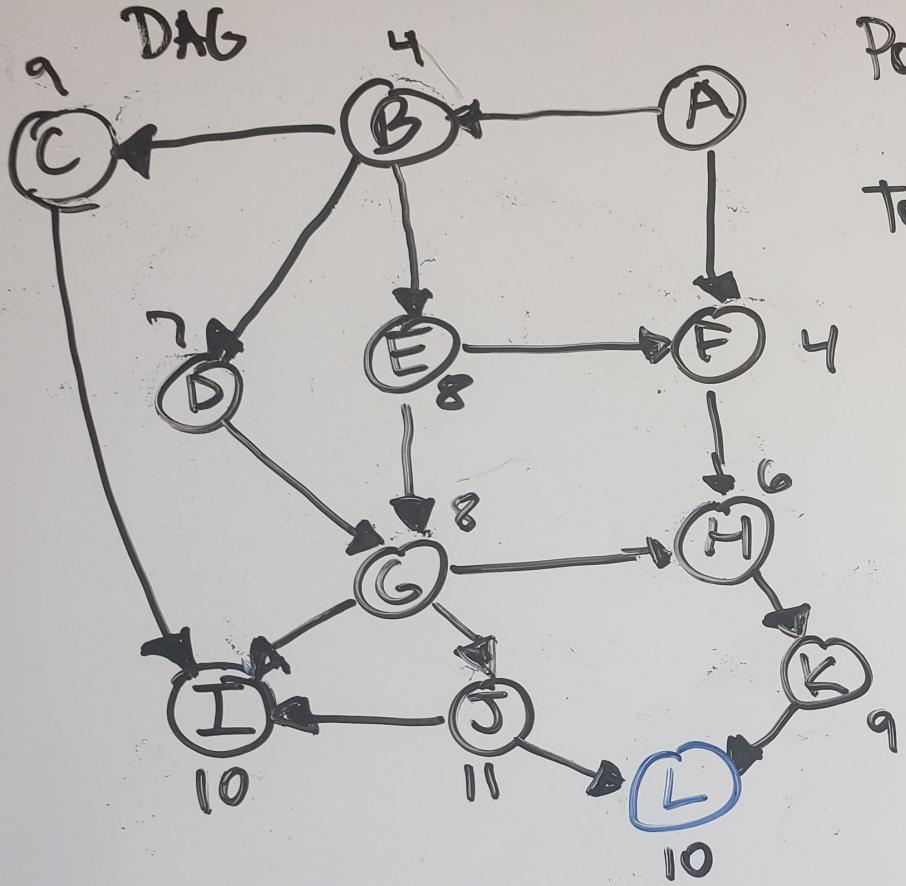
I C L K H J G D F E B A

Topological Order:

A B E F D G J H K L C I

Shortest Path on
DAG

	distTo[]	edgeTo[]
A	0	0 - 1
B	1	1 - 2
C	2	1 - 3
D	3	1 - 4
E	4	0 - 5
F	5	3 - 6
G	6	5 - 7
H	7	6 - 8
I	8	6 - 9
J	9	7 - 10
K	10	10 - 11
L	11	



Postorder:

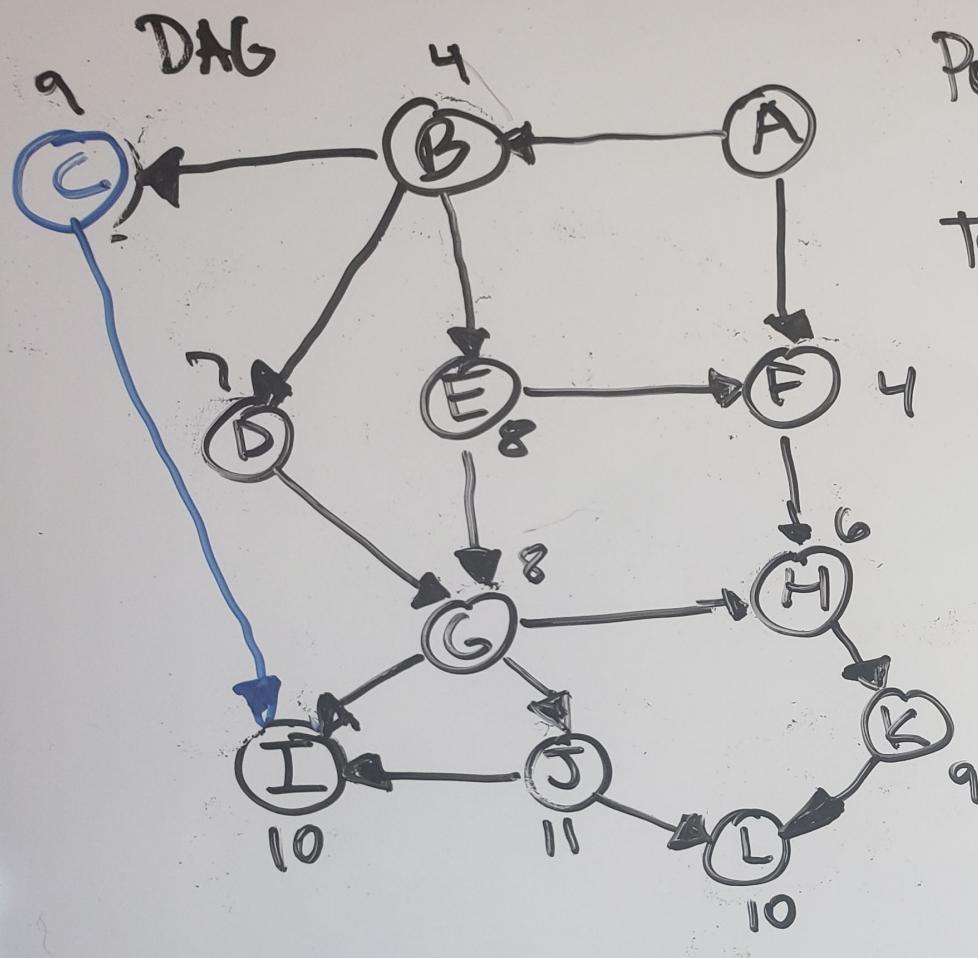
I C L K H J G D F E B A

Topological Order:

A B E F D G J H K L C I

Shortest Path on DAG

	distTo[]	edgeTo[]
A	0	0-1
B	4	1-2
C	9	1-3
D	7	1-4
E	8	0-5
F	4	3-6
G	6	5-7
H	7	6-8
I	8	6-9
J	9	7-10
K	10	10-11
L	11	



Postorder:

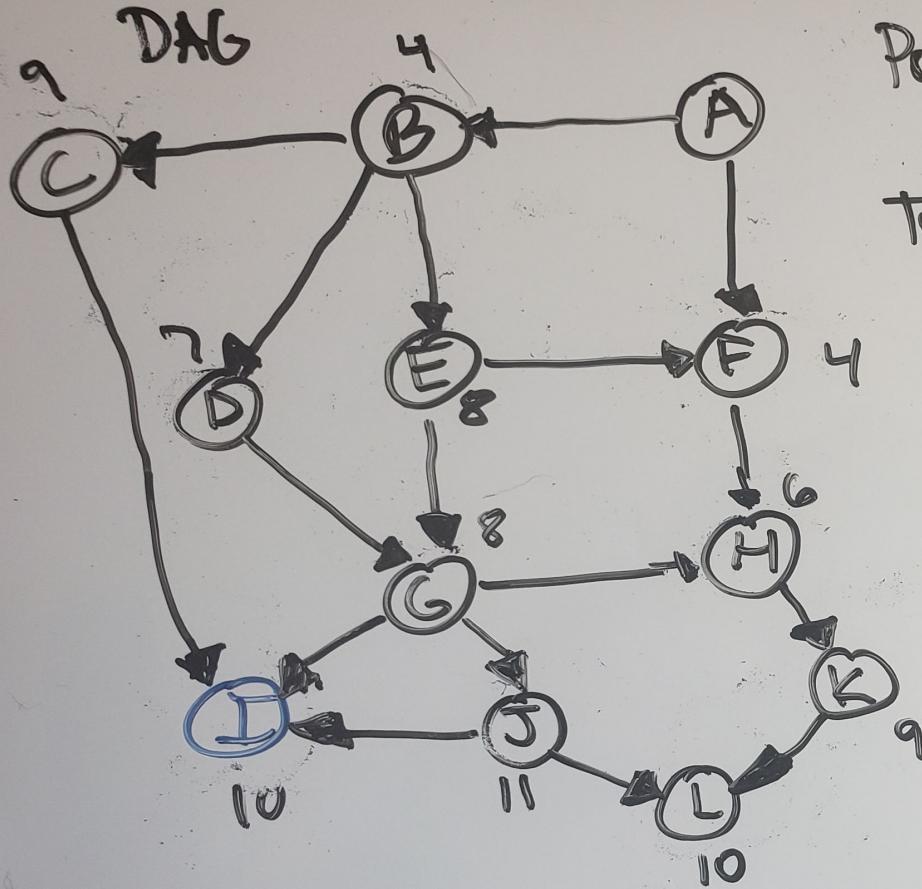
I C L L K H J G D F E B A

Topological Order:

A B E F D G J H K L C I

Shortest Path on DAG

	distTo[]	edgeTo[]
A	0	0
B	1	4
C	2	9
D	3	7
E	4	8
F	5	4
G	6	8
H	7	6
I	8	10
J	9	11
K	10	9
L	11	10



Postorder:

I C L K H J G D F E B A

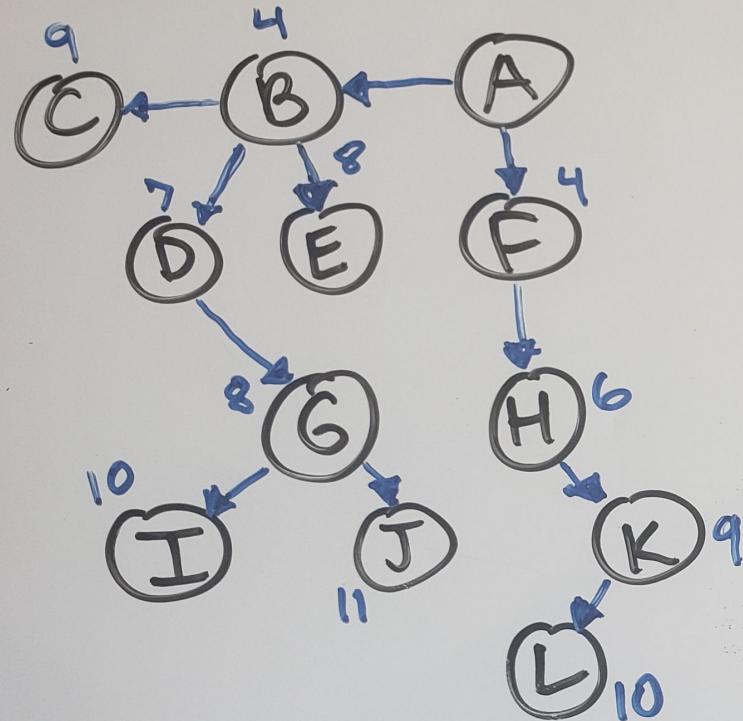
Topological Order:

A B E F D G J H K L C I

Shortest Path on DAG

	distTo[]	edgeTo[]
V	0	0 - 1
O	4	1 - 2
I	4	1 - 3
C	9	1 - 4
G	7	0 - 5
E	8	3 - 6
F	5	5 - 7
H	6	6 - 8
J	7	6 - 9
I	8	7 - 10
K	9	10 - 11
L	10	
C	11	

Shortest Path



Postorder:

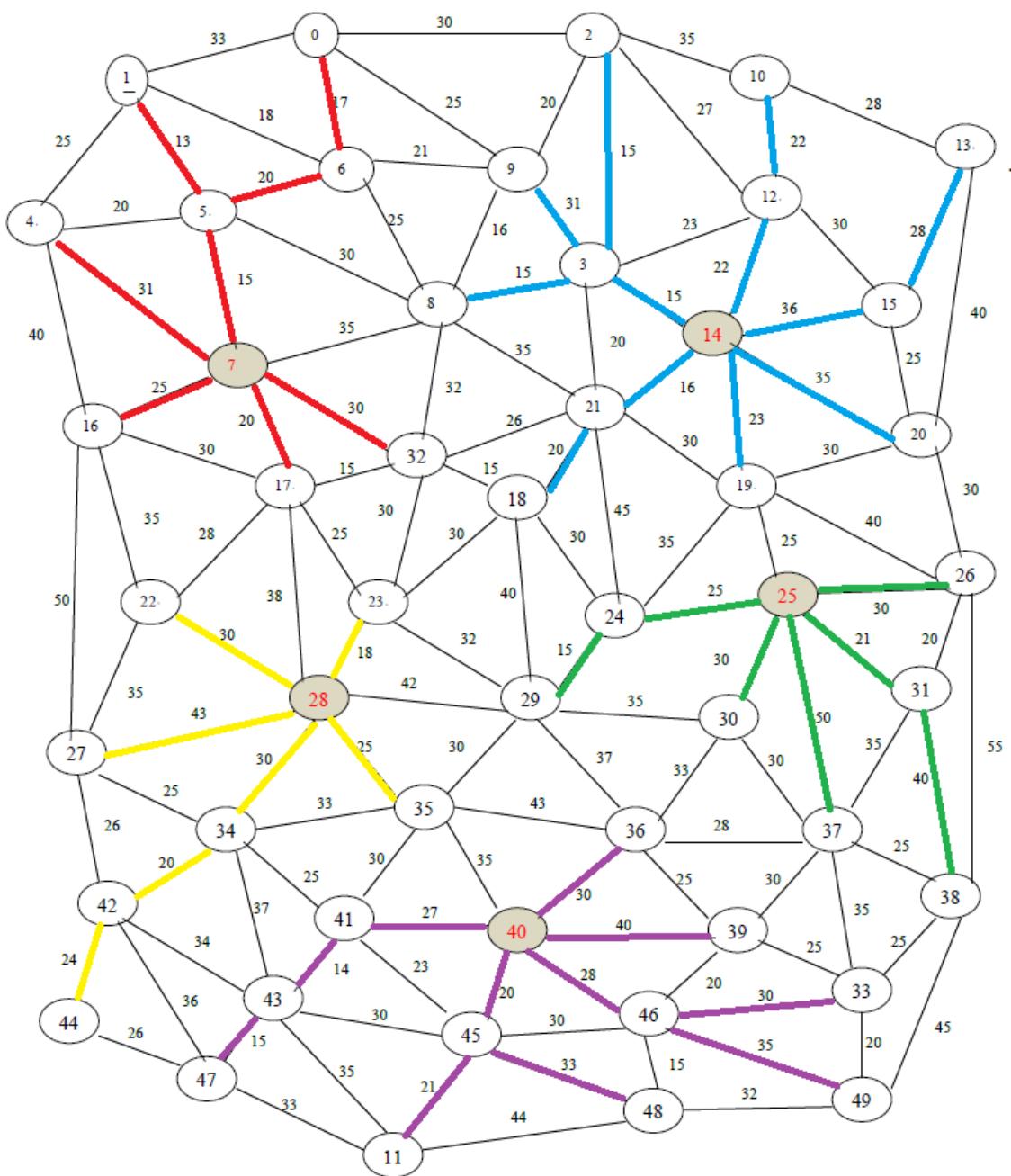
I C L K H J G D F E B A

Topological Order:

A B E F D G J H K L C I

Shortest Path on DAG

	distTo[]	edgeTo[]
V	0	0 - 1
O	4	1 - 2
4	9	1 - 3
G	7	1 - 4
C	8	0 - 5
D	4	3 - 6
E	5	5 - 7
F	6	6 - 8
H	7	6 - 9
I	8	7 - 10
J	9	10 - 11
K	10	
L	10	



Total Response Time for overall shortest path, 5 sites: 1607.0

Total Response Time for only Site 7: 4269.0

Total Response Time for only Site 14: 4033.0

Total Response Time for only Site 25: 4013.0

Total Response Time for only Site 28: 3925.0

Total Response Time for only Site 40: 4636.0

Site 28 has the shortest response time for all customers if it's the only site