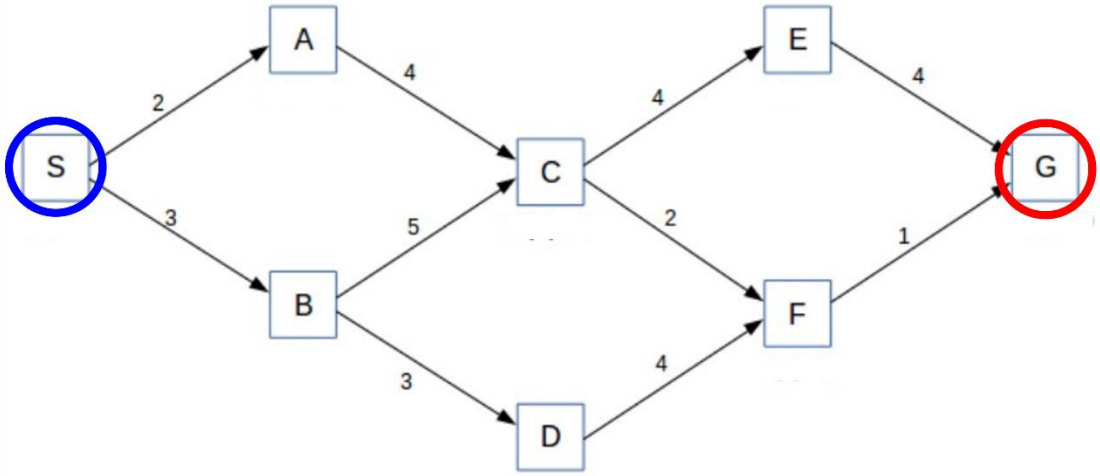
IN-CLASS EXERCISE (I2)

Student ID:..... Duration: 15 mins Date: 03/07/2023

Student name: ..... Score: ...../ 3

Consider the following graph. The initial state is **vertex S**, and the goal state is **vertex G**. The heuristic table is shown aside the graph. **Ties are broken in alphabetical order**.



Vertex	Heuristic
S	6
A	5
B	3
C	3
D	4
E	3
F	1
G	0

For each of the following search strategies, state the order in which states are expanded and the path returned. Vertices should be presented in their exact order.

Note that

- *The path returned will not be accepted if the list of expanded states is wrong.*
- *We apply early stopping for BFS, DFS, IDS, and GBFS*
- *For IDS, you only need to present the lists of expanded states for the first three levels, yet you must run till the end to get the path returned by this algorithm.*

Algorithm	**List of expanded states in exact order**	**Path returned**
Uniform cost search (0.5pt)		
Breadth-first search (0.5pt)		
Depth-first search (0.5pt) avoid repeating any state on the current path		
Iterative deepening search (0.5pt)	Level 0: Level 1: Level 2:	
Graph-search GBFS (0.5pt)		
Graph-search A* (0.5pt)		

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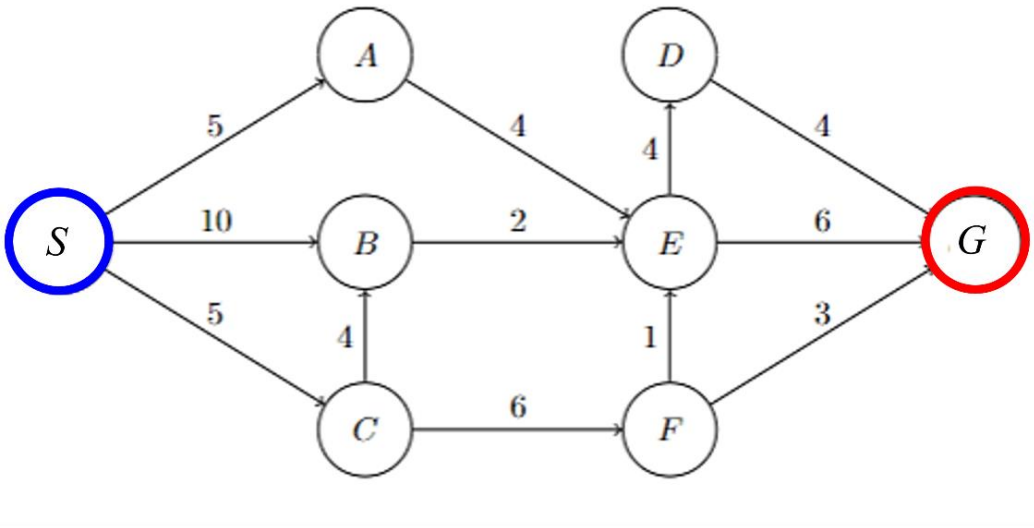
Consider the following graph. The initial state is **vertex S**, and the goal state is **vertex G**. The heuristic table is shown aside the graph. **Ties are broken in alphabetical order**.



Vertex	Heuristic
S	2
A	6
B	4
C	6
D	2
E	2
F	3
G	0

For each of the following search strategies, state the order in which states are expanded and the path returned. Vertices should be presented in their exact order.

Note that

- *The path returned will not be accepted if the list of expanded states is wrong.*
- *We apply early stopping for BFS, DFS, IDS, and GBFS*
- *For IDS, you only need to present the lists of expanded states for the first three levels, yet you must run till the end to get the path returned by this algorithm.*

Algorithm	**List of expanded states in exact order**	**Path returned**
Uniform cost search (0.5pt)		
Breadth-first search (0.5pt)		
Depth-first search (0.5pt) avoid repeating any state on the current path		
Iterative deepening search (0.5pt)	Level 0: Level 1: Level 2:	
Graph-search GBFS (0.5pt)		
Graph-search A* (0.5pt)		

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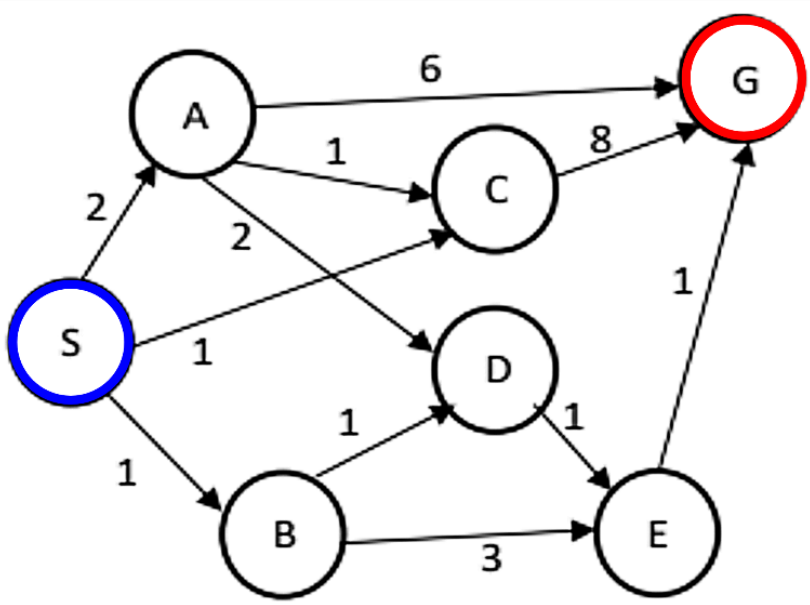
Consider the following graph. The initial state is **vertex S**, and the goal state is **vertex G**. The heuristic table is shown aside the graph. **Ties are broken in alphabetical order**.



Vertex	Heuristic
S	10
A	8
B	5
C	5
D	4
E	2
G	0

For each of the following search strategies, state the order in which states are expanded and the path returned. Vertices should be presented in their exact order.

Note that

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- *We apply early stopping for BFS, DFS, IDS, and GBFS*
- *For IDS, you only need to present the lists of expanded states for the first three levels, yet you must run till the end to get the path returned by this algorithm.*

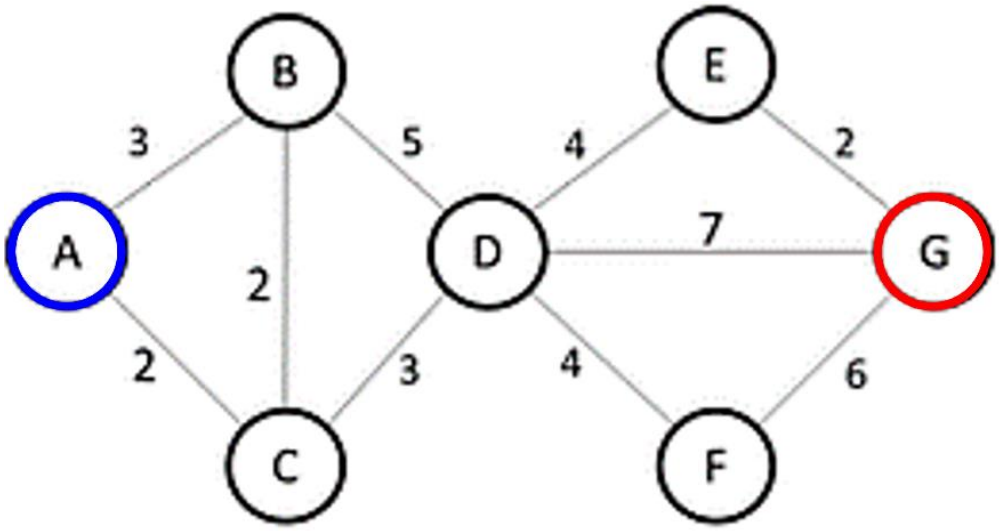
Algorithm	**List of expanded states in exact order**	**Path returned**
Uniform cost search (0.5pt)		
Breadth-first search (0.5pt)		
Depth-first search (0.5pt) avoid repeating any state on the current path		
Iterative deepening search (0.5pt)	Level 0: Level 1: Level 2:	
Graph-search GBFS (0.5pt)		
Graph-search A* (0.5pt)		

IN-CLASS EXERCISE (I2)

Student ID:..... Duration: 15 mins Date: 03/07/2023

Student name: ..... Score: ...../ 3

Consider the following graph. The initial state is **vertex A**, and the goal state is **vertex G**. The heuristic table is shown aside the graph. **Ties are broken in alphabetical order**.



Vertex	Heuristic
A	13
B	11
C	12
D	5
E	2
F	1
G	0

For each of the following search strategies, state the order in which states are expanded and the path returned. Vertices should be presented in their exact order.

Note that

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- *We apply early stopping for BFS, DFS, IDS, and GBFS*
- *For IDS, you only need to present the lists of expanded states for the first three levels, yet you must run till the end to get the path returned by this algorithm.*

Algorithm	**List of expanded states in exact order**	**Path returned**
Uniform cost search (0.5pt)		
Breadth-first search (0.5pt)		
Depth-first search (0.5pt) avoid repeating any state on the current path		
Iterative deepening search (0.5pt)	Level 0: Level 1: Level 2:	
Graph-search GBFS (0.5pt)		
Graph-search A* (0.5pt)		

SOLUTION

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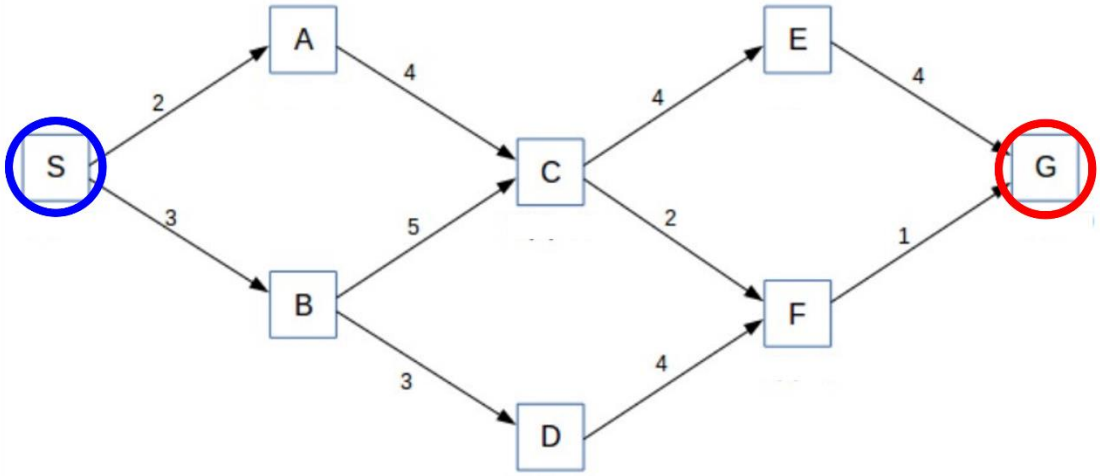

Vertex	Heuristic
S	6
A	5
B	3
C	3
D	4
E	3
F	1
G	0

For each of the following search strategies, state the order in which states are expanded and the path returned. Vertices should be presented in their exact order.

Note that

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- *We apply early stopping for BFS, DFS, IDS, and GBFS*
- *For IDS, you only need to present the lists of expanded states for the first three levels, yet you must run till the end to get the path returned by this algorithm.*

Algorithm	**List of expanded states in exact order**	**Path returned**
Uniform cost search (0.5pt)	S A B C D F G	S A C F G
Breadth-first search (0.5pt)	S A B C D E	S A C E G
Depth-first search (0.5pt) avoid repeating any state on the current path	S A C E	S A C E G
Iterative deepening search (0.5pt)	Level 0: S Level 1: S A B Level 2: S A C B C D	S A C E G
Graph-search GBFS (0.5pt)	S B C F	S B C F G
Graph-search A* (0.5pt)	S B A C F G	S A C F G

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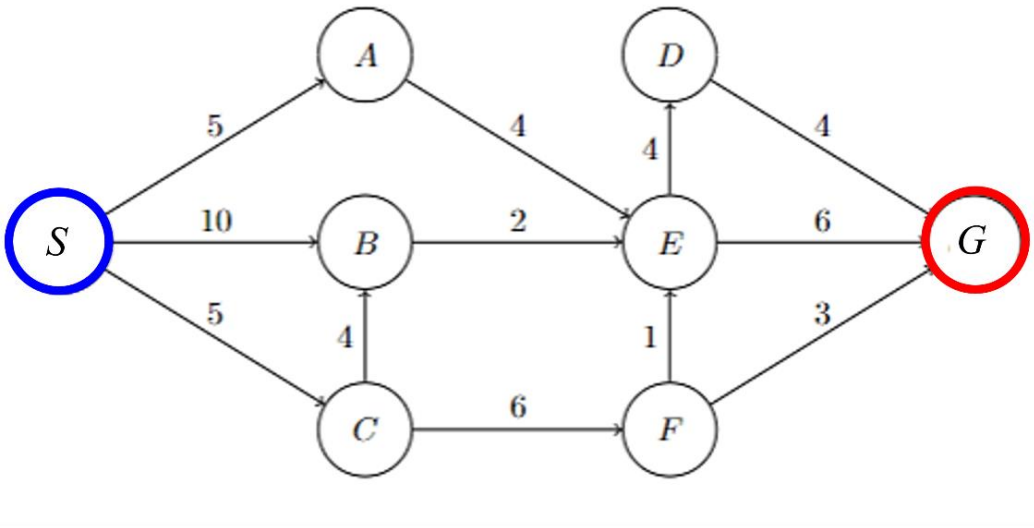
Consider the following graph. The initial state is **vertex S**, and the goal state is **vertex G**. The heuristic table is shown aside the graph. **Ties are broken in alphabetical order**.



Vertex	Heuristic
S	2
A	6
B	4
C	6
D	2
E	2
F	3
G	0

For each of the following search strategies, state the order in which states are expanded and the path returned. Vertices should be presented in their exact order.

Note that

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Algorithm	**List of expanded states in exact order**	**Path returned**
Uniform cost search (0.5pt)	S A C E B F D G	S C F G
Breadth-first search (0.5pt)	S A B C E	S A E G
Depth-first search (0.5pt) avoid repeating any state on the current path	S A E	S A E G
Iterative deepening search (0.5pt)	Level 0: S Level 1: S A B C Level 2: S A E B E C B F	S A E G
Graph-search GBFS (0.5pt)	S B E	S B E G
Graph-search A* (0.5pt)	S A C E B F G	S C F G

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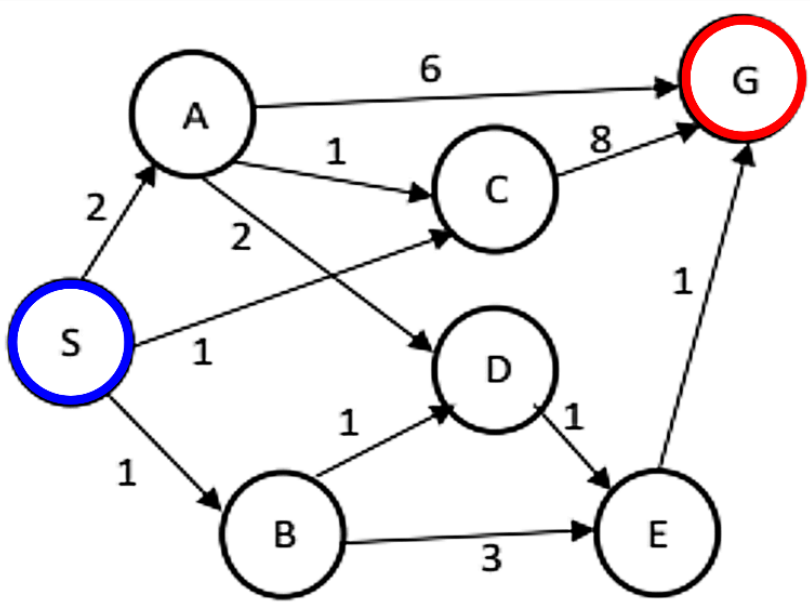
Consider the following graph. The initial state is **vertex S**, and the goal state is **vertex G**. The heuristic table is shown aside the graph. **Ties are broken in alphabetical order**.



Vertex	Heuristic
S	10
A	8
B	5
C	5
D	4
E	2
G	0

For each of the following search strategies, state the order in which states are expanded and the path returned. Vertices should be presented in their exact order.

Note that

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- *For IDS, you only need to present the lists of expanded states for the first three levels, yet you must run till the end to get the path returned by this algorithm.*

Algorithm	**List of expanded states in exact order**	**Path returned**
Uniform cost search (0.5pt)	S B C A D E G	S B D E G
Breadth-first search (0.5pt)	S A	S A G
Depth-first search (0.5pt) avoid repeating any state on the current path	S A	S A G
Iterative deepening search (0.5pt)	Level 0: S Level 1: S A B C Level 2: S A	S A G
Graph-search GBFS (0.5pt)	S B E	S B E G
Graph-search A* (0.5pt)	S B C D E G	S B D E G

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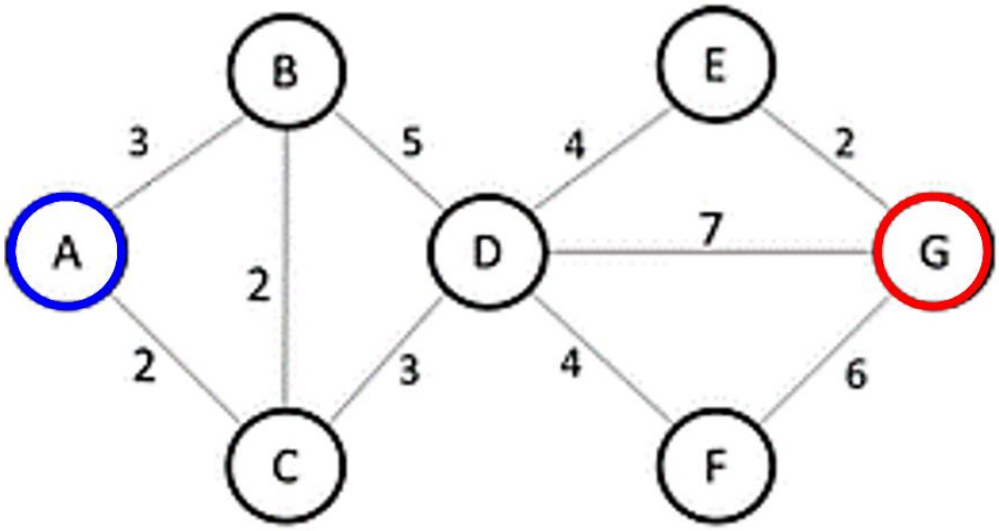
Student name: ..... Score: ...../ 3

Consider the following graph. The initial state is **vertex A**, and the goal state is **vertex G**. The heuristic table is shown aside the graph. **Ties are broken in alphabetical order**.



Vertex	Heuristic
A	13
B	11
C	12
D	5
E	2
F	1
G	0

For each of the following search strategies, state the order in which states are expanded and the path returned. Vertices should be presented in their exact order.

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Algorithm	**List of expanded states in exact order**	**Path returned**
Uniform cost search (0.5pt)	A C B D E F G	A C D E G
Breadth-first search (0.5pt)	A B C D	A B D G
Depth-first search (0.5pt) avoid repeating any state on the current path	A B C D	A B C D G
Iterative deepening search (0.5pt)	Level 0: A Level 1: A B C Level 2: A B C D C B D	A B D G
Graph-search GBFS (0.5pt)	A B D	A B D G
Graph-search A* (0.5pt)	A B D F C E G	A B D E G