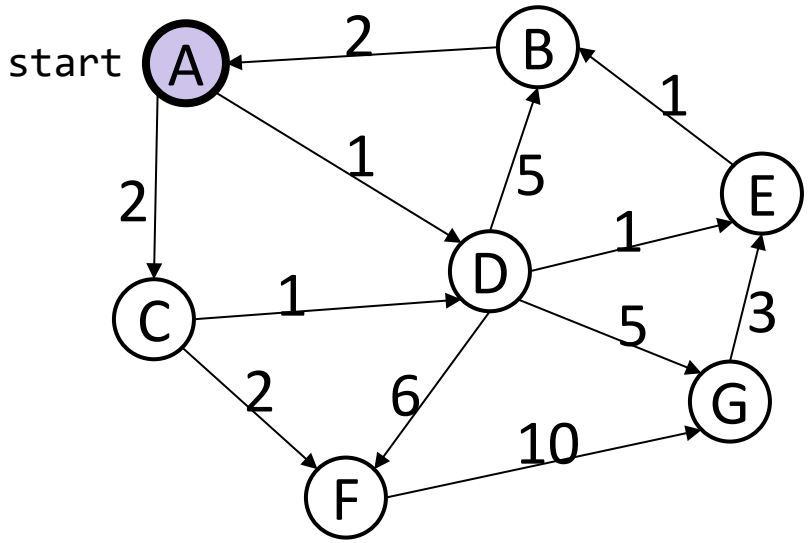
Lecture 13
Shortest Paths
Exercises

Department of Computer Science
Hofstra University

Acknowledgement: Lecture slides based on UofW Course on Data Structures

Q. Dijkstra's Algorithm

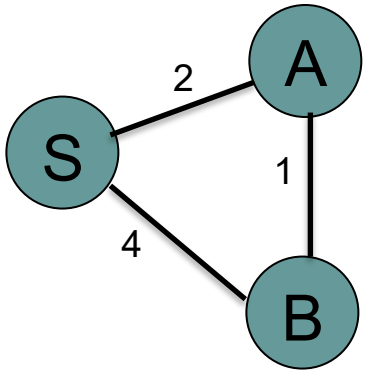
Exam question: Given this directed graph, run Dijkstra's Algo to find shortest paths starting from source node A. Give the node visit order, and fill in this table of SN (Shortest Distance) and PN (Previous Node), crossing out old SD and PN as you find a shortcut path with smaller SD



Visit Order

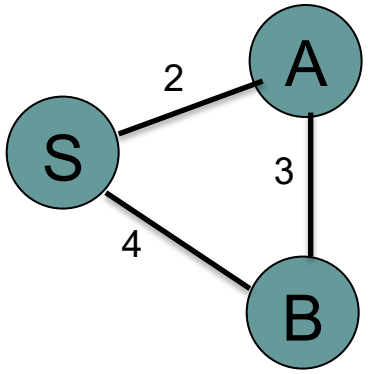
Node	SD	PN
A		
B		
C		
D		
E		
F		
G		

Q. Dijkstra's Algorithm (Source Node S)



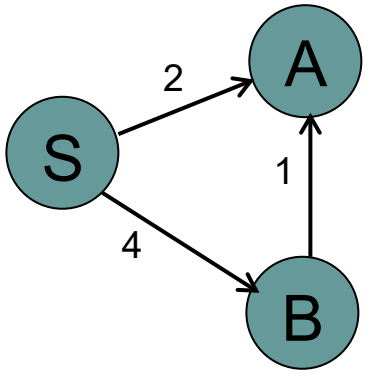
ANS

Node	SD	PN
S	0	/
A		
B		



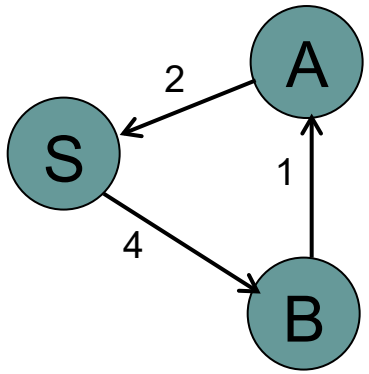
ANS

Node	SD	PN
S	0	/
A		
B		



ANS

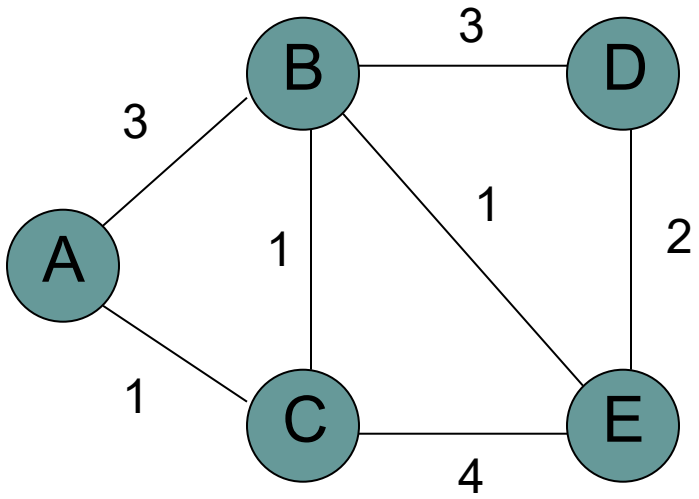
Node	SD	PN
S	0	/
A		
B		



ANS

Node	SD	PN
S	0	/
A		
B		

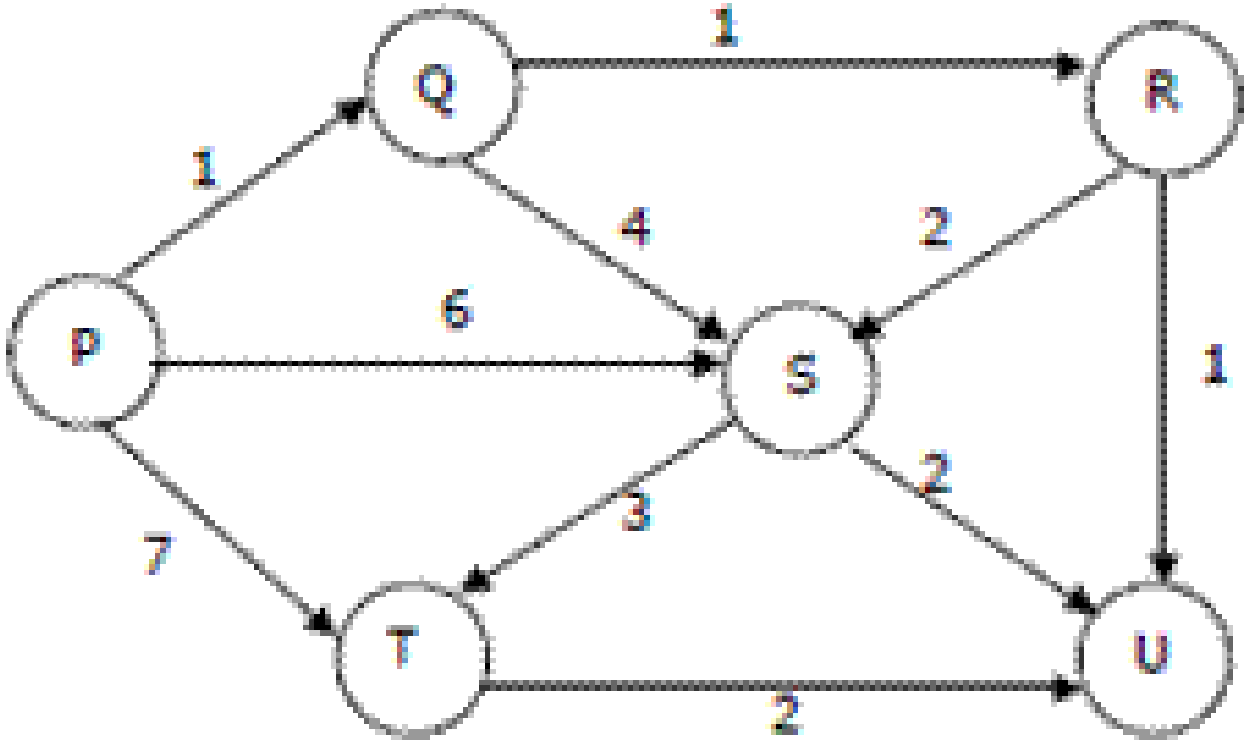
Q. Dijkstra's Algorithm (Source Node A, Undirected Graph)



Visit Order

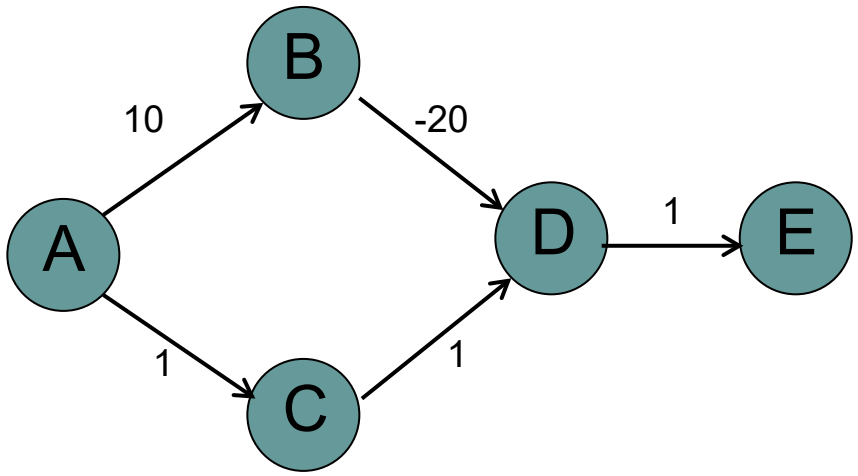
Node	SD	PN
A		
B		
C		
D		
E		

Q. Dijkstra's Algorithm (Source Node P, Directed Graph)



Q. Topological Sort

Consider this DAG, use Topological Sort to find Shortest Paths in DAG, considering all possible topological orders



Visit Order
0, 1, 4, 7, 5, 2, 3, 6

Node	SD	PN
A	0	/
B		
C		
D		
E		