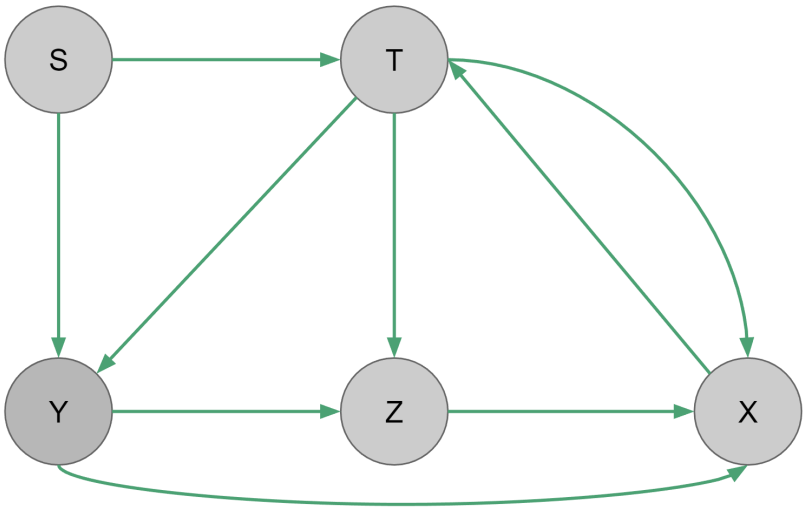
CSE 332: Data Structures and Parallelism

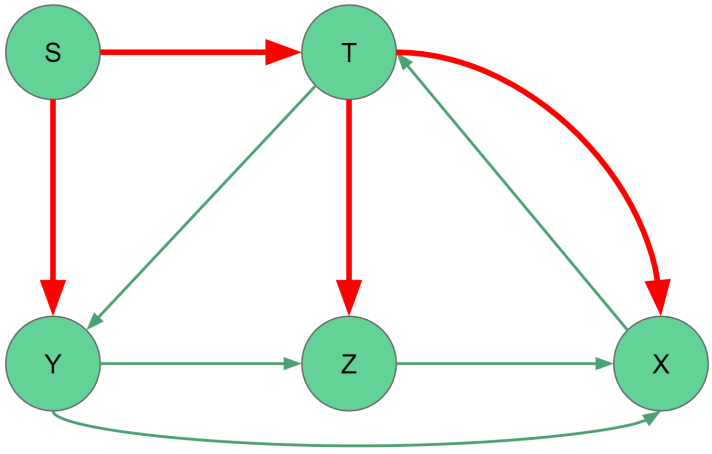
Section 6: Graphs

0. Simulating BFS

Do a BFS traversal of this graph starting at node S. What is the resulting tree?

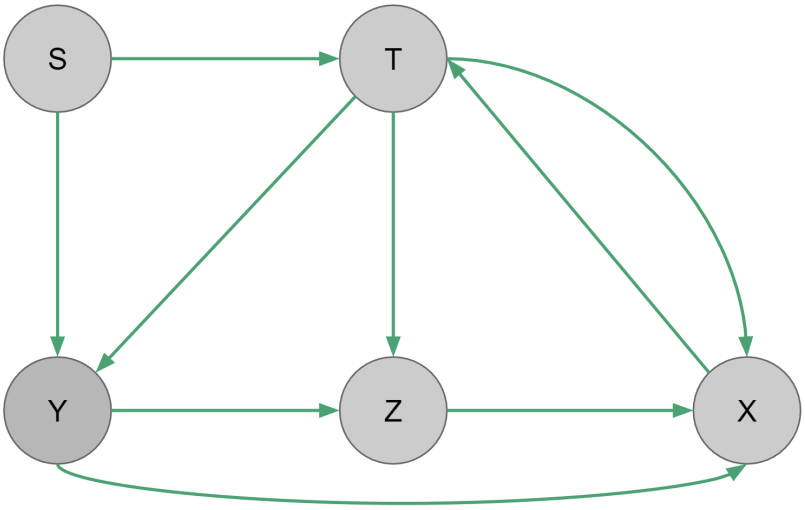


Vertex	Pred	Processed?
S		
T		
X		
Y		
Z		

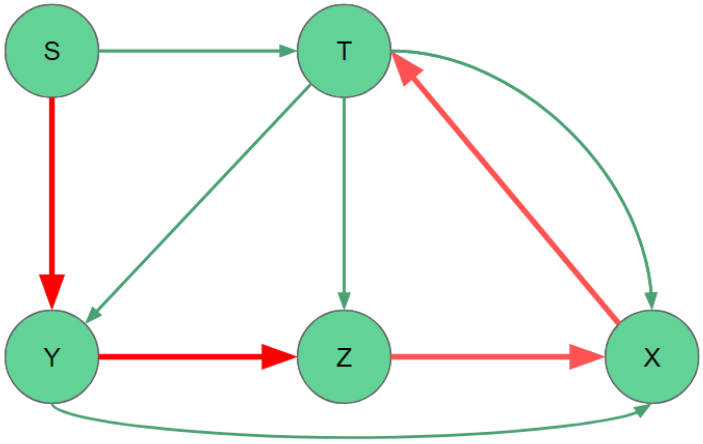


1. Simulating DFS

Do a DFS traversal of this graph starting at node S. What is the resulting tree?

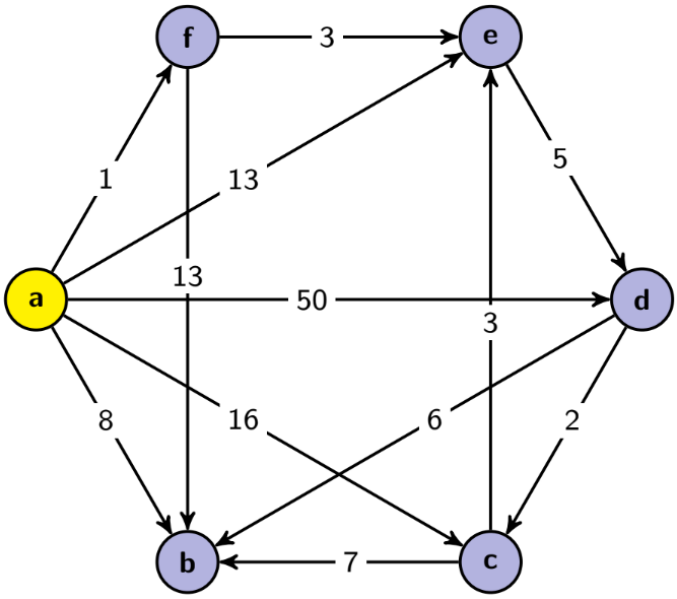


Vertex	Pred	Processed?
S		
T		
X		
Y		
Z		



2. Velociraptors

Consider the following graph:



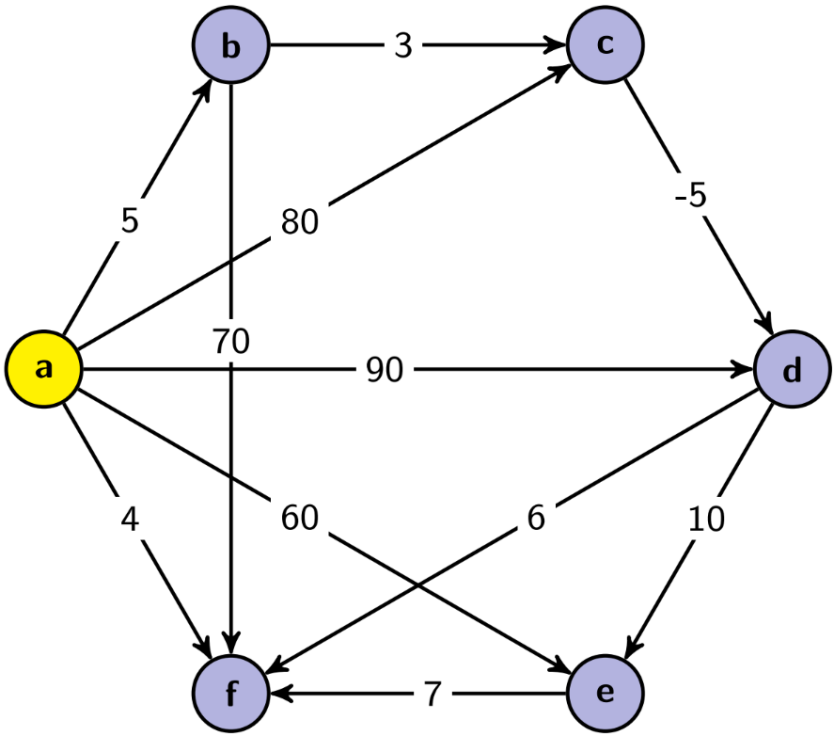
Suppose that you are at **a** and you are planning your escape from a bunch of hungry velociraptors (edge weights represent the expected number of velociraptors you will meet on this path). Run Dijkstra's Algorithm to **find the lengths of the shortest paths** (fewest number of velociraptors met) from **a** to each of the other vertices. Remember to store the path variable and **list the order vertices are added to the known set**.

Vertex	Known	Cost of Path	Pred
a			
b			
c			
d			
e			
f			

Order added to known set:

3. Better Find the Shortest Path Before It Catches You!

Consider the following graph:



a) Use Dijkstra's Algorithm to find the lengths of the shortest paths from a to each of the other vertices. Show your work at every step.

Vertex	Known	Cost of Path	Pred
a			
b			
c			
d			
e			
f			

Order added to known set:

b) Are any of the lengths you computed using Dijkstra's Algorithm in part (a) incorrect? Why or why not?

c) Explain how you would use Dijkstra's Algorithm to recover the actual paths (rather than just the lengths).