

Node Edges

Chosen edges are colored salmon.

A	AB: 3	AG: 1	AJ: 4						
B	BA: 3	BC: 1	BE: 5	BJ: 2					
C	CB: 1	CD: 4	CH: 3	CJ: 4					
D	DC: 4	DE: 2							
E	EB: 5	ED: 2	EF: 5	EH: 3					
F	FD: 6	FE: 5	FG: 1	FH: 2					
G	GA: 1	GF: 1	GH: 4	GJ: 3					
H	HC: 3	HE: 3	HF: 2	HG: 4	HJ: 2				
J	JA: 4	JB: 2	JC: 4	JG: 3	JH: 2				

PRIM'S Algorithm for Minimum Spanning Tree

nodes: A Hash tree, giving the node names and node objects.

edges: An ArrayList of Edge objects

fringe: A heap (priority queue) of Edge objects

1. Choose any node to be the current node and mark it "done".
2. Add all the edges from current's adjacency list into the fringe.
3. Loop until all of the nodes in the graph are "done" or the fringe is empty.
 - a. Remove the lowest-cost edge, e, from the fringe.
 - b. If both nodes at its ends are already "done", discard this edge and continue the loop.
 - c. Otherwise, mark this edge as "chosen".
 - d. One of its end points is "done", the other not. Let current be the node that is not yet "done".
 - e. Mark the current node "done" and put all of its edges into the fringe.

A	B	C	D	E	F	G	H	J
done								

A	B	C	D	E	F	G	H	J
done						done		

A	B	C	D	E	F	G	H	J
done					done	done		

A	B	C	D	E	F	G	H	J
done					done	done	done	

Choose A to be the current node. Add all its edges to the fringe.

Fringe: AB: 3 AG: 1 AJ: 4

Remove AG: 1 G is not yet done, so choose this edge as part of the solution. G is current (and done). Add its edges to the fringe.

Fringe: AB: 3 AJ: 4 GA: 1 GF: 1 GH: 4 GJ: 3

Remove GA: 1 A and G are both "done", so discard this edge.

Remove GF: 1 F is not yet done, so choose this edge as part of the solution. F becomes current (and done). Add its edges to the fringe.

Fringe: AB: 3 AJ: 4 GH: 4 GJ: 3 FD: 6 FE: 5 FG: 1 FH: 2

Remove FG: 1 F and G are both "done", so discard this edge.

Remove FH: 2 H is not yet done, so choose this edge as part of the solution. H becomes current (and done). Add its edges to the fringe.

Fringe: AB: 3 AJ: 4 GH: 4 GJ: 3 FD: 6 FE: 5 HC: 3 HE: 3 HF: 2
HG: 4 HJ: 2

Remove HF: 2 F and H are both "done", so discard this edge.

Remove HJ: 2 J is not yet done, so choose this edge as part of the solution.

A	B	C	D	E	F	G	H	J
done					done	done	done	done

A	B	C	D	E	F	G	H	J
done	done				done	done	done	done

A	B	C	D	E	F	G	H	J
done	done	done			done	done	done	done

A	B	C	D	E	F	G	H	J
done	done	done		done	done	done	done	done

A	B	C	D	E	F	G	H	J
done	done	done	done	done	done	done	done	done

J becomes current (and done). Add its edges to the fringe.

Fringe: AB: 3 AJ: 4 GH:4 GJ:3 FD:6 FE:5 HC:3 HE:3 HG:4
 JA:4 JB:2 JC:4 JG:3 JH:2

Remove JB: 2 B is not yet done, so choose this edge as part of the solution. B becomes current (and done). Add its edges to the fringe.

Fringe: AB: 3 AJ: 4 GH:4 GJ:3 FD:6 FE:5 HC:3 HE:3 HG:4
 JA: 4 JC: 4 JG: 3 JH: 2 BA: 3 BC: 1 BE: 5 BJ: 2

Remove BC: 1 C is not yet done, so choose this edge as part of the solution. C becomes current (and done). Add its edges to the fringe.

Fringe: AB: 3 AJ: 4 GH: 4 GJ: 3 FD: 6 FE: 5 HC: 3 HE: 3 HG: 4 JA: 4
 JC: 4 JG: 3 JH: 2 BA: 3 BE: 5 BJ: 2 CB: 1 CD: 4 CH: 3 CJ: 4

Remove CB: 1 C and B are both "done", so discard this edge.

Remove JH: 2 J and H are both "done", so discard this edge.

Remove BJ: 2 B and J are both "done", so discard this edge.

Remove CH: 3 C and H are both "done", so discard this edge.

Remove HE: 3 E is not yet done, so choose this edge as part of the solution. E becomes current (and done). Add its edges to the fringe.

Fringe: AB: 3 AJ: 4 GH: 4 GJ: 3 FD: 6 FE: 5 HC: 3 HG: 4 JA: 4 JC: 4
 JG: 3 BA: 3 BE: 5 CD: 4 CJ: 4 EB: 5 ED: 2 EF:5 EH:3

Remove ED: 2 D is not yet done, so choose this edge as part of the solution. D becomes current (and done). This is the last node, so we are finished.