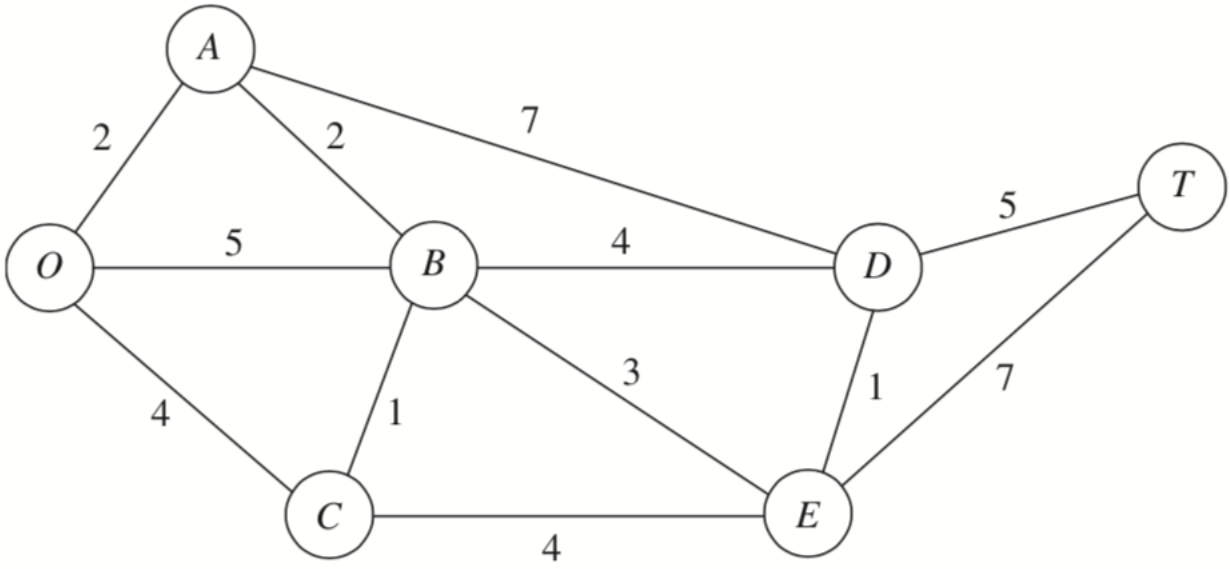
Tutorial 11

COMP 2611

1. Consider the following graph:



   (a) Find the minimum spanning tree of this graph

   (b) Determine the single source shortest path from the following nodes:

      i. D

      ii. A

   (c) Using the details in Figure 1, find the shortest path from our origin to our destination.

   (d) Using the details in Figure 2, find the minimum spanning tree.

10.3-2. You need to take a trip by car to another town that you have never visited before. Therefore, you are studying a map to determine the shortest route to your destination. Depending on which route you choose, there are five other towns (call them A, B, C, D, E) that you might pass through on the way. The map shows the mileage along each road that directly connects two towns without any intervening towns. These numbers are summarized in the following table, where a dash indicates that there is no road directly connecting these two towns without going through any other towns.

	Miles between Adjacent Towns					
Town	**A**	**B**	**C**	**D**	**E**	**Destination**
Origin	40	60	50	—	—	—
A		10	—	70	—	—
B			20	55	40	—
C				—	50	—
D					10	60
E						80

Figure 1: Figure #1

10.4-2. The Wirehouse Lumber Company will soon begin logging eight groves of trees in the same general area. Therefore, it must develop a system of dirt roads that makes each grove accessible from every other grove. The distance (in miles) between every pair of groves is as follows:

		Distance between Pairs of Groves							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
	1	—	1.3	2.1	0.9	0.7	1.8	2.0	1.5
	2	1.3	—	0.9	1.8	1.2	2.6	2.3	1.1
	3	2.1	0.9	—	2.6	1.7	2.5	1.9	1.0
Grove	4	0.9	1.8	2.6	—	0.7	1.6	1.5	0.9
	5	0.7	1.2	1.7	0.7	—	0.9	1.1	0.8
	6	1.8	2.6	2.5	1.6	0.9	—	0.6	1.0
	7	2.0	2.3	1.9	1.5	1.1	0.6	—	0.5
	8	1.5	1.1	1.0	0.9	0.8	1.0	0.5	—

Management now wishes to determine between which pairs of groves the roads should be constructed to connect all groves with a minimum total length of road.

Figure 2: Figure #2