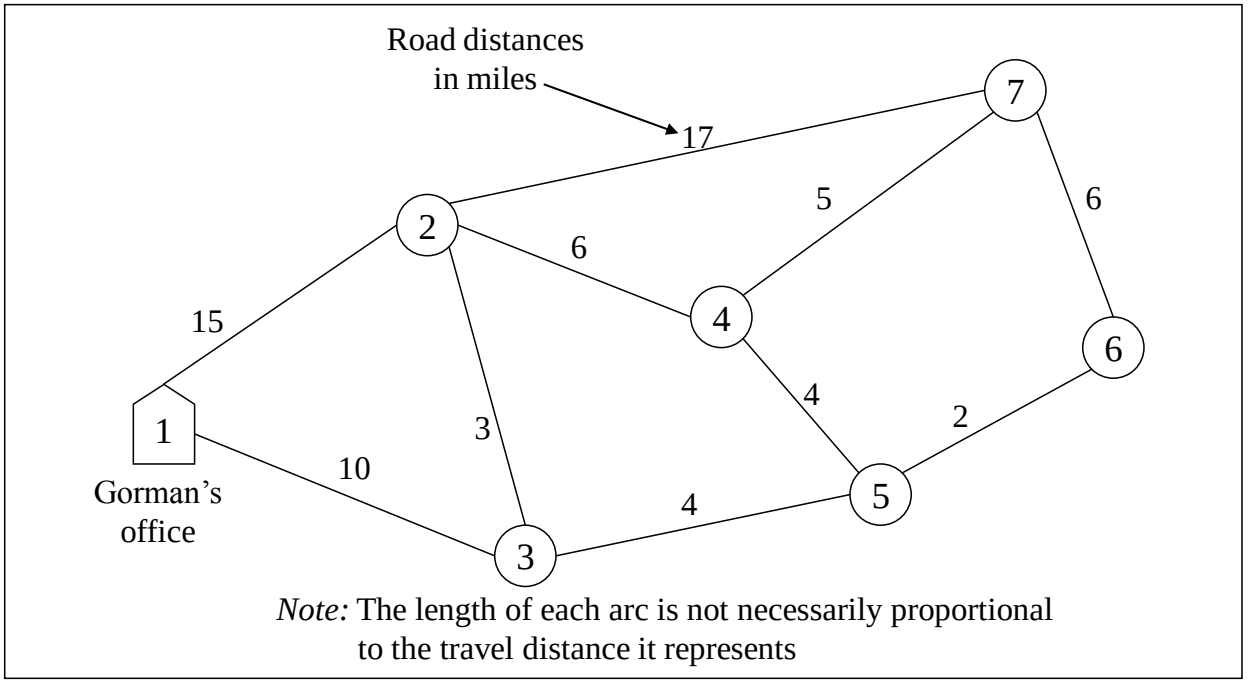
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM



Note: The length of each arc is not necessarily proportional to the travel distance it represents

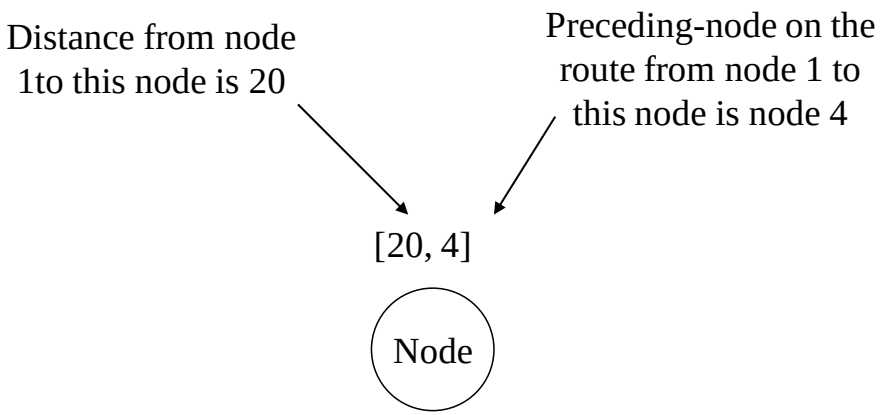
Προσδιορισμός συντομότερων διαδρομών μεταξύ δύο κόμβων στο δίκτυο με το ελάχιστο κόστος/απόσταση

The primary objective is to determine the shortest route or path between any pair of nodes in the network.

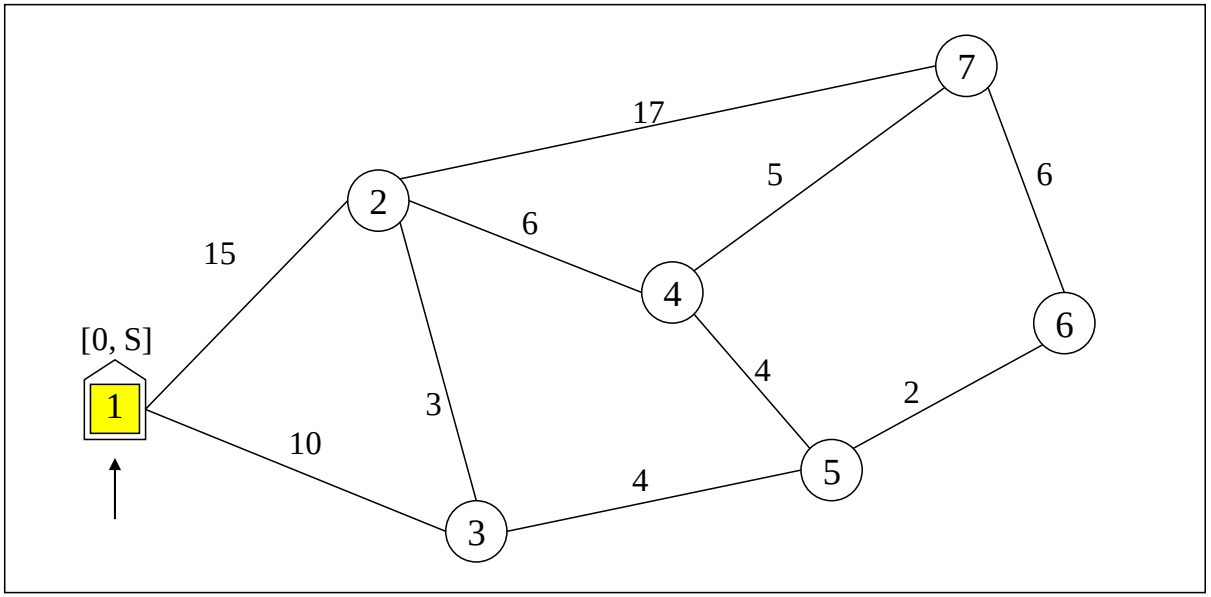
2

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

ΕΓΓΡΑΦΗ ΚΟΜΒΟΥ: Node label



ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM
(Dijktsra's label correcting algorithm)

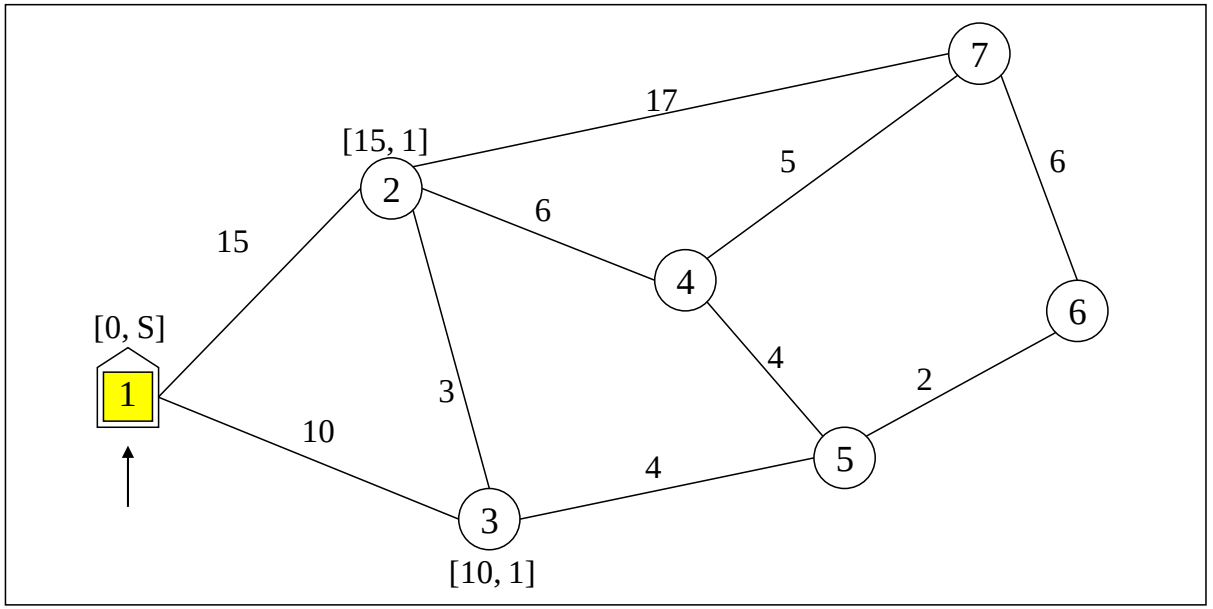


<u>Μόνιμα Εγγεγραμένος</u>: A permanently labelled node is a node for which the shortest route from node 1has been determined.

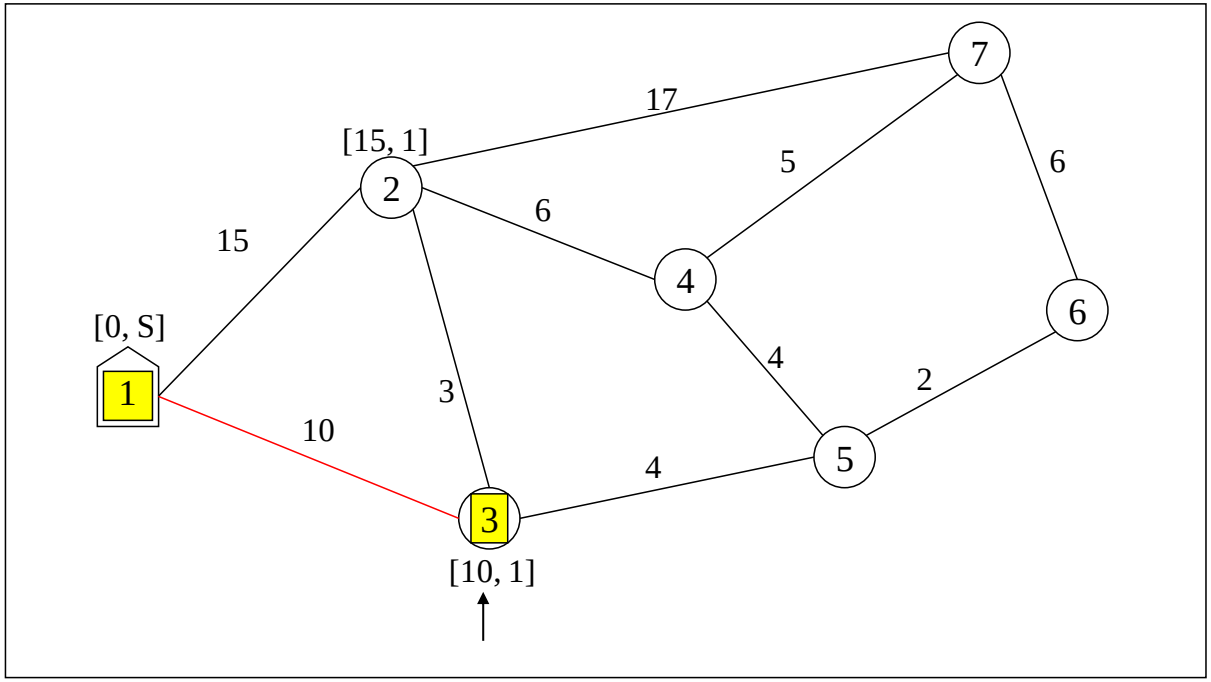
<u>Προσωρινά Εγγεγραμένος</u>: A tentatively labelled node is a node whose shortest route to node 1 has not yet been found.

4

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM
(Dijktsra's label correcting algorithm)

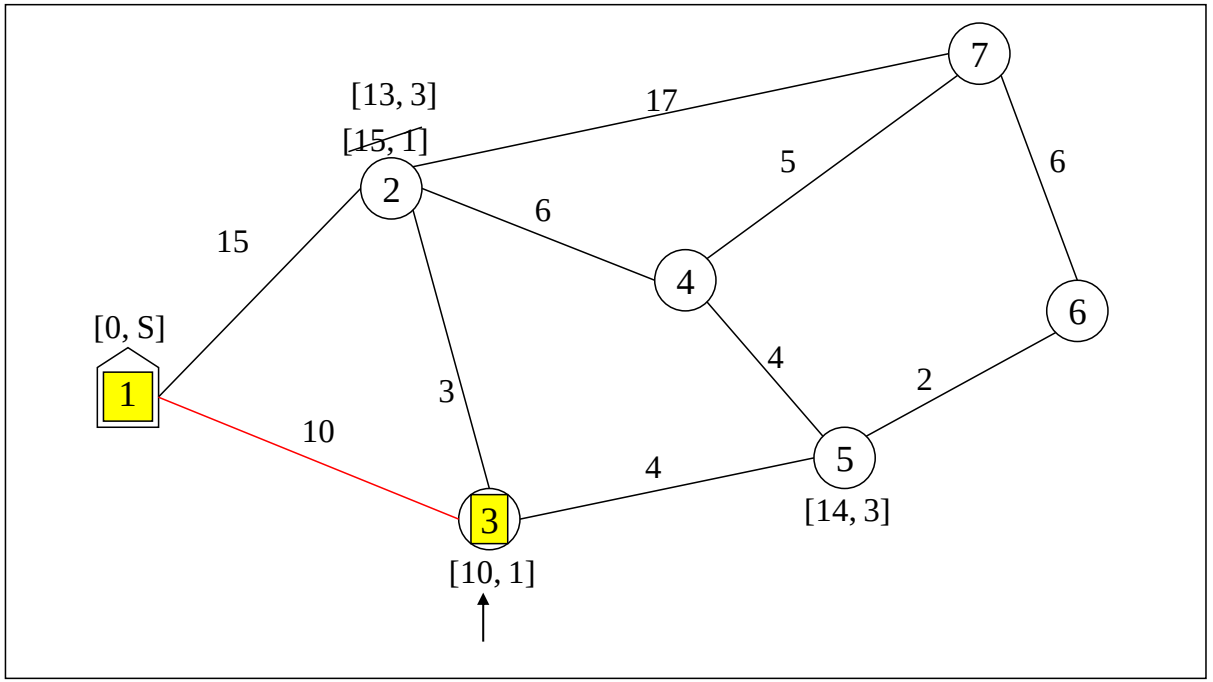


ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM
(Dijktsra's label correcting algorithm)

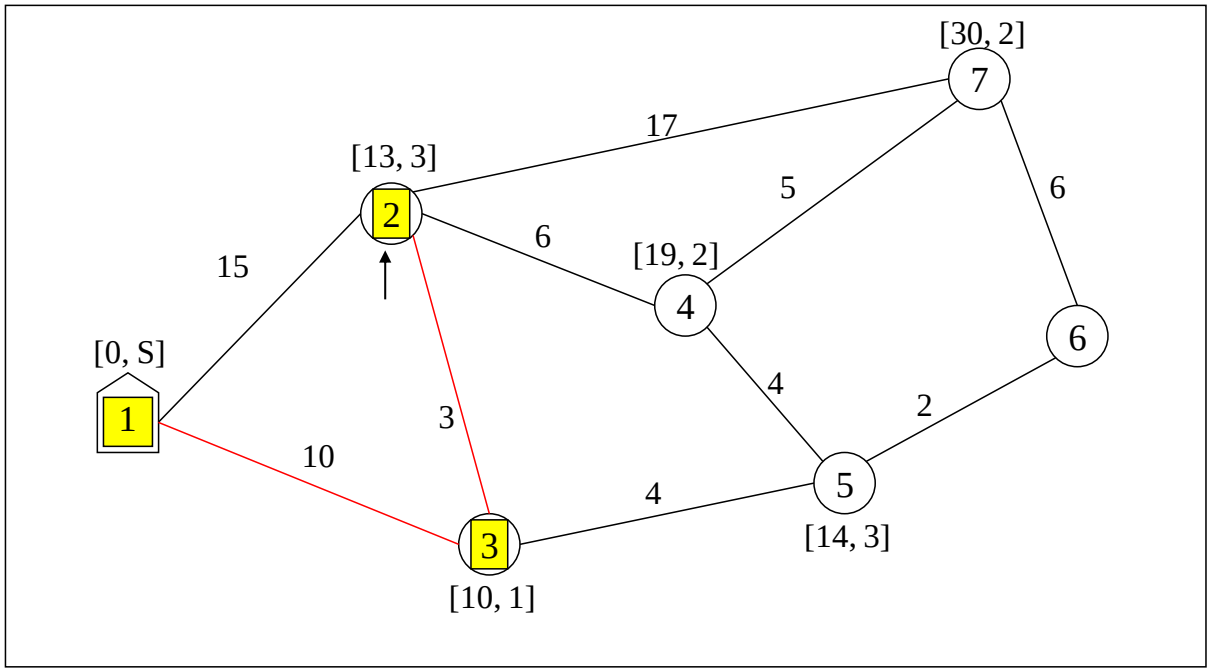


6

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM
(Dijktsra's label correcting algorithm)



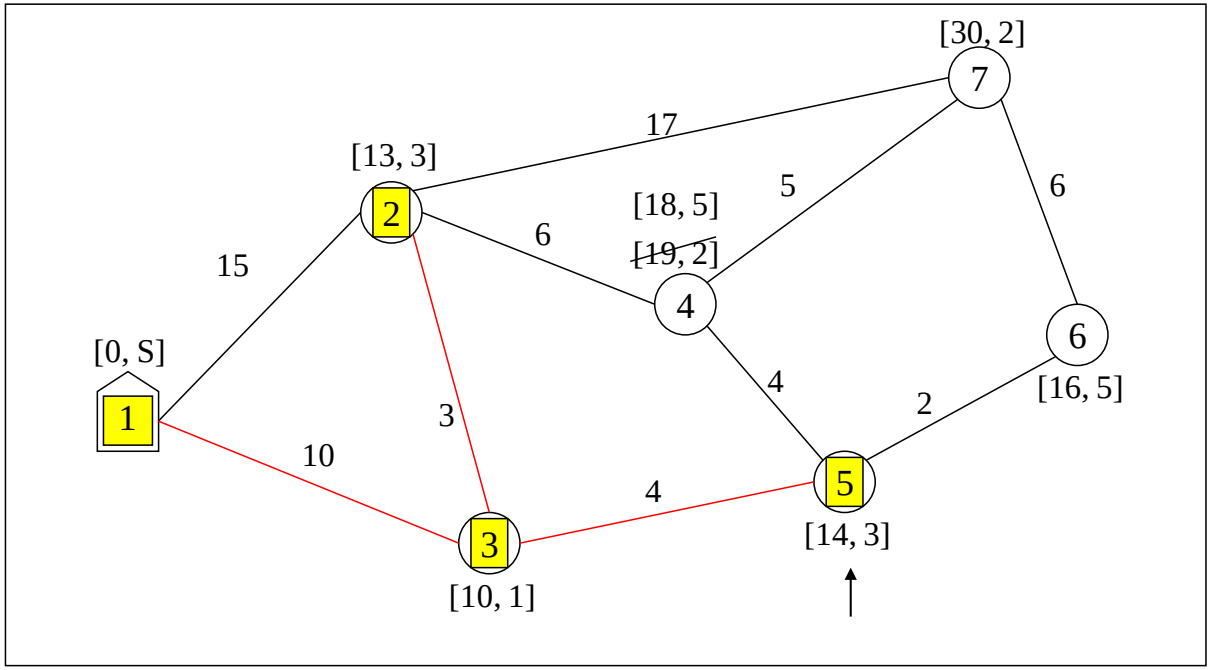
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM
(Dijktsra's label correcting algorithm)



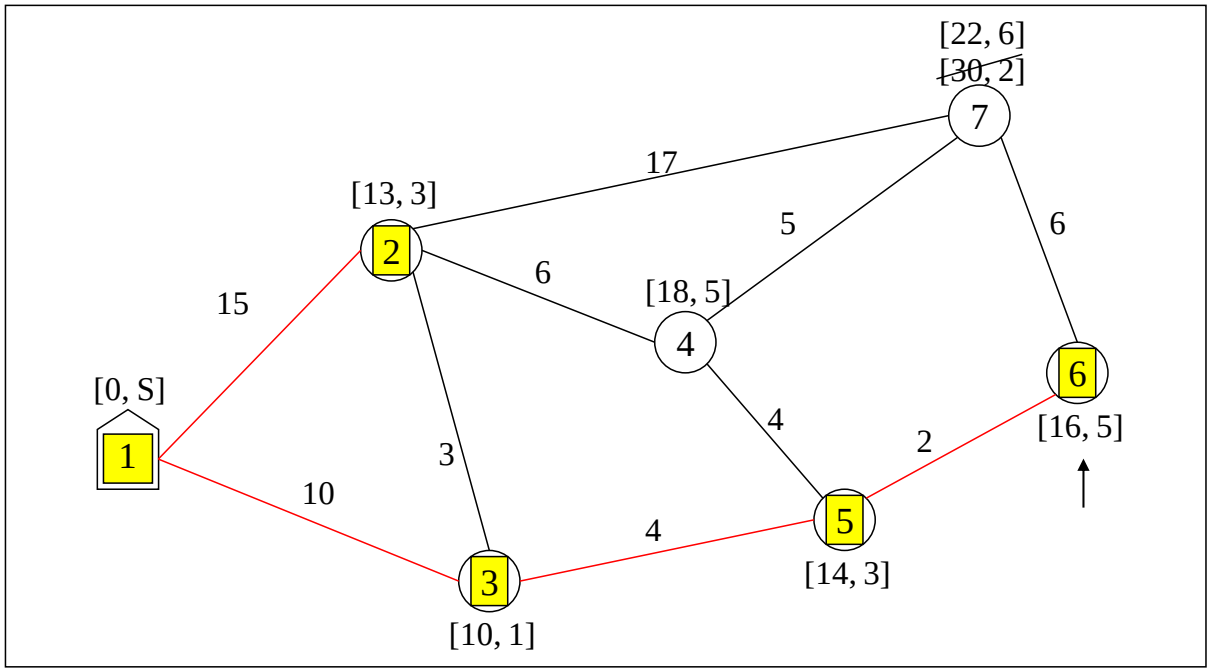
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ

SHORTEST-ROUTE PROBLEM

(Dijktsra's label correcting algorithm)



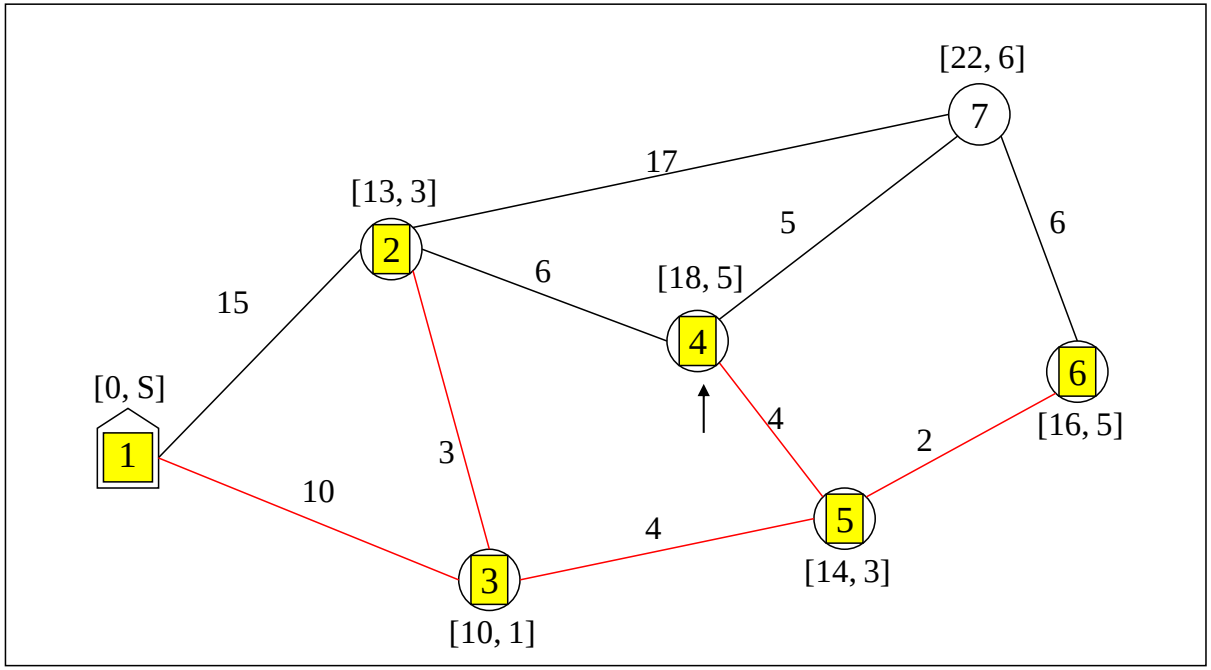
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM
(Dijktsra's label correcting algorithm)



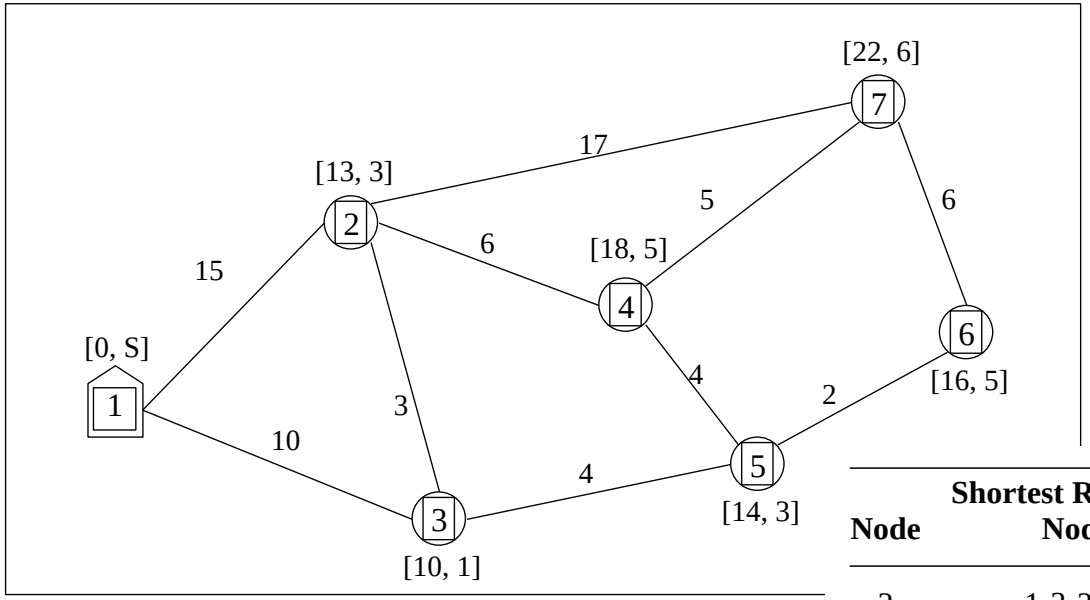
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ

SHORTEST-ROUTE PROBLEM

(Dijktsra's label correcting algorithm)



ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM
(Dijktsra's label correcting algorithm)



Node	Shortest Route from Node 1	Distance in Miles
2	1-3-2	13
3	1-3	10
4	1-3-5-4	18
5	1-3-5	14
6	1-3-5-6	16
7	1-3-5-6-7	22

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM
(Dijktsra's label correcting algorithm)

Step 1 Assign node 1 the permanent label [0, S]; The 0 indicates that the distance from node 1 to itself is zero and the S indicates that node 1 is the starting node.

Step 2 Compute tentative labels for the nodes that can be reached directly from node 1. The first number in each label is the direct distance from node 1 to the node in question; we refer to this portion of the label as the distance value. The second number in each label, which we refer to as the preceding-node value, indicates the preceding node on the route from node 1 to the node in question; thus, in this step the preceding node value is 1 since we are only considering nodes that can be directly reached from node 1.

Step 3 Identify the tentatively labeled node with the smallest distance value, and declare that node permanently labeled. If all nodes are permanently labeled, go to step 5.

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM
(Dijktsra's label correcting algorithm)

Step 4 Consider the remaining nodes that are not permanently labeled and that can be reached directly from the new permanently labeled node identified in step 3. Compute new tentative labels for these nodes as follows:

a. If the node in question has a tentative label, add the distance value at the new permanently labeled node to the direct distance from the new permanently labeled node to the node in question. If this sum is less than the distance value for the node in question, set the distance value for this node equal to this sum; in addition, set the preceding-node value equal to the new permanently labeled node that provided the smaller distance. Go to step 3.

b. If the node in question is not yet labeled, create a tentative label by adding the distance value at the new permanently labeled node to the direct distance from the new permanently labeled node to the node in question. The preceding-node value is set equal to the new permanently labeled node. Go to step 3.

14

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM
(Dijktsra's label correcting algorithm)

Step 5 The permanent labels identify both the shortest distance from node 1 to each node and the preceding node on the shortest route. The shortest route to a given node can be found by starting at the given node and moving to its preceding node. Continuing this backward movement through the network will provide the shortest route from node 1 to the node in question.

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

**** NETWORK DESCRIPTION ****

7 NODES AND 10 ARCS

ARC	START NODE	END NODE	DISTANCE
1	1	2	15
2	1	3	10
3	2	3	3
4	2	4	6
5	2	7	17
6	3	5	4
7	4	5	4
8	4	7	5
9	5	6	2
10	6	7	6

16

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

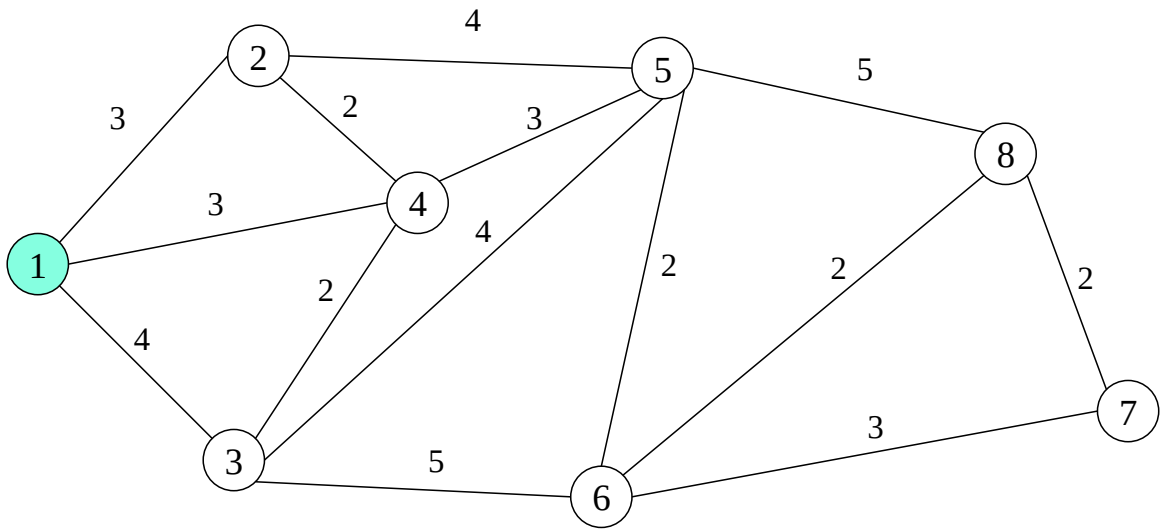
THE SHORTEST ROUTE FROM NODE 1 TO NODE 7
****

START NODE	END NODE	DISTANCE
1	3	10
3	5	4
5	6	2
6	7	6
TOTAL DISTANCE		22

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

Problem Description

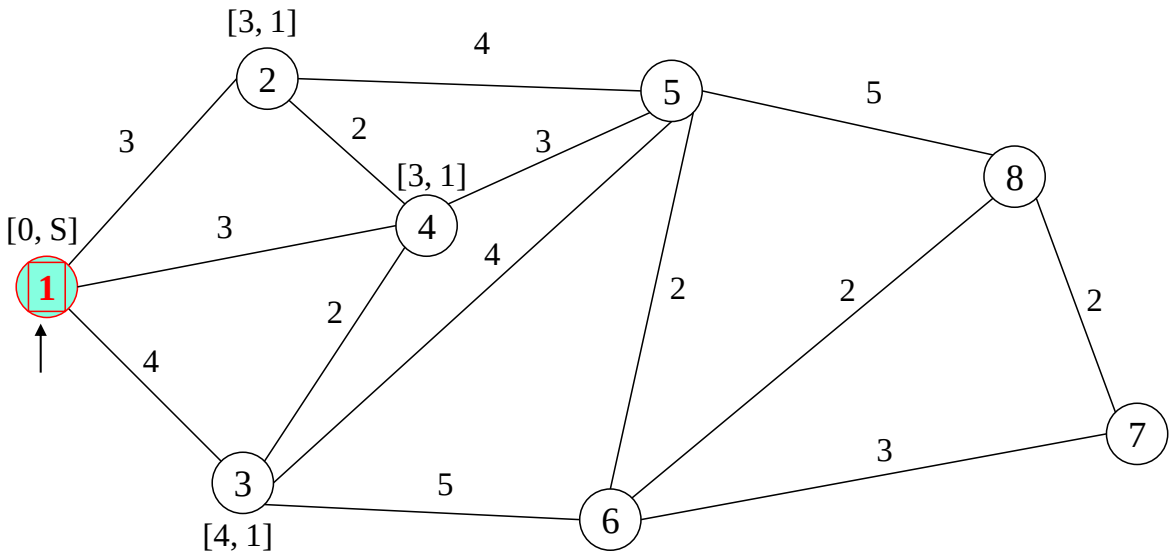
Find the shortest route between nodes 1 and 8 in the following network:



18

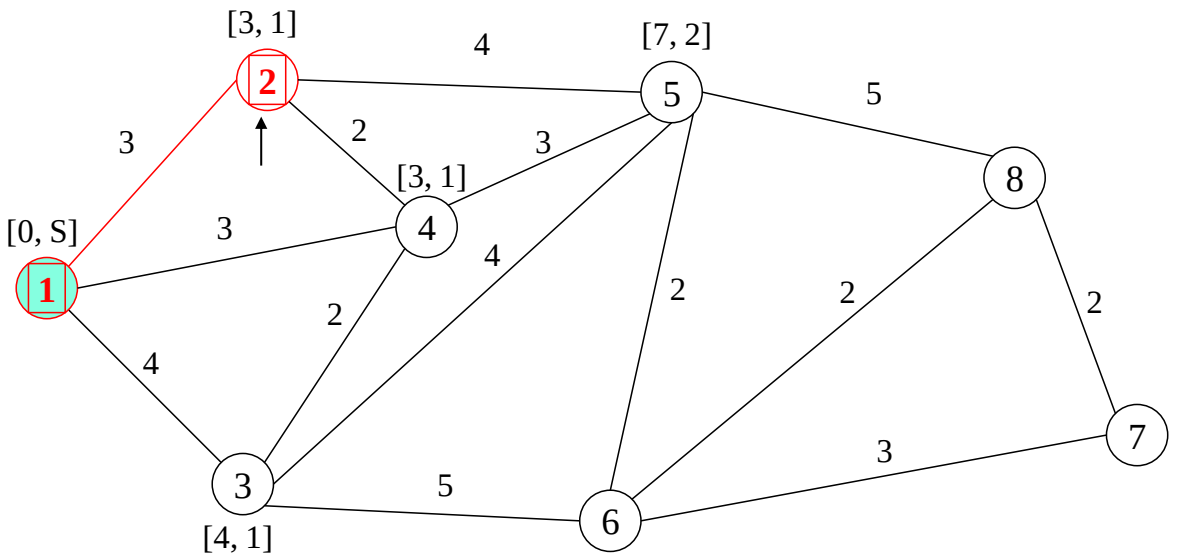
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

Node 1 is permanently labeled; nodes 2, 3, and 4 are temporarily labeled



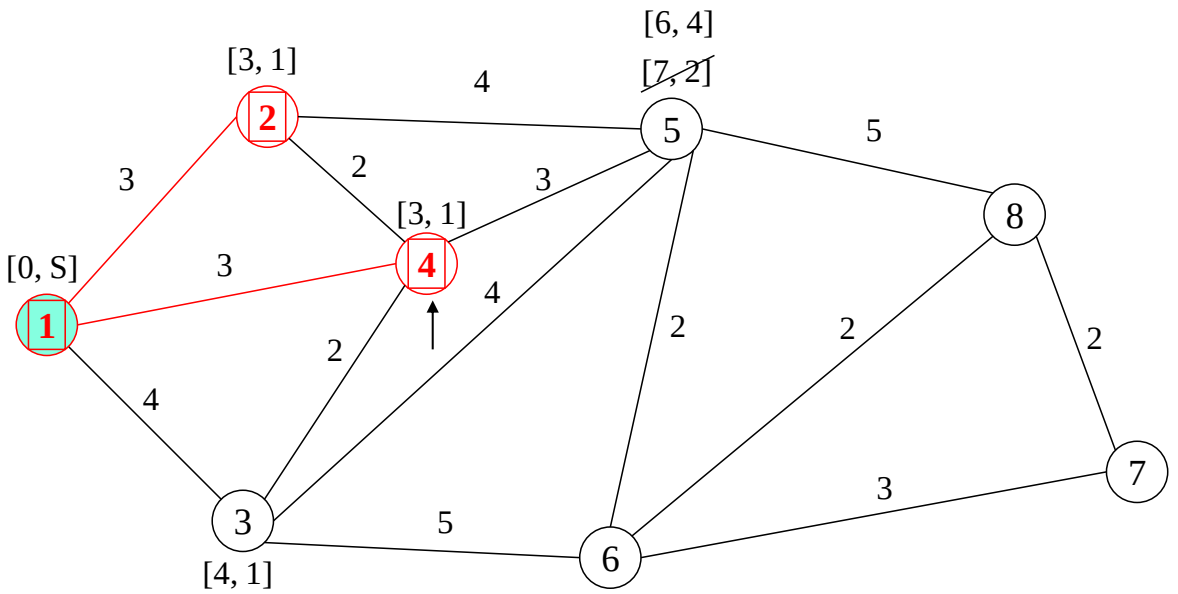
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

Node 2 is permanently labeled; node 5 is temporarily labeled



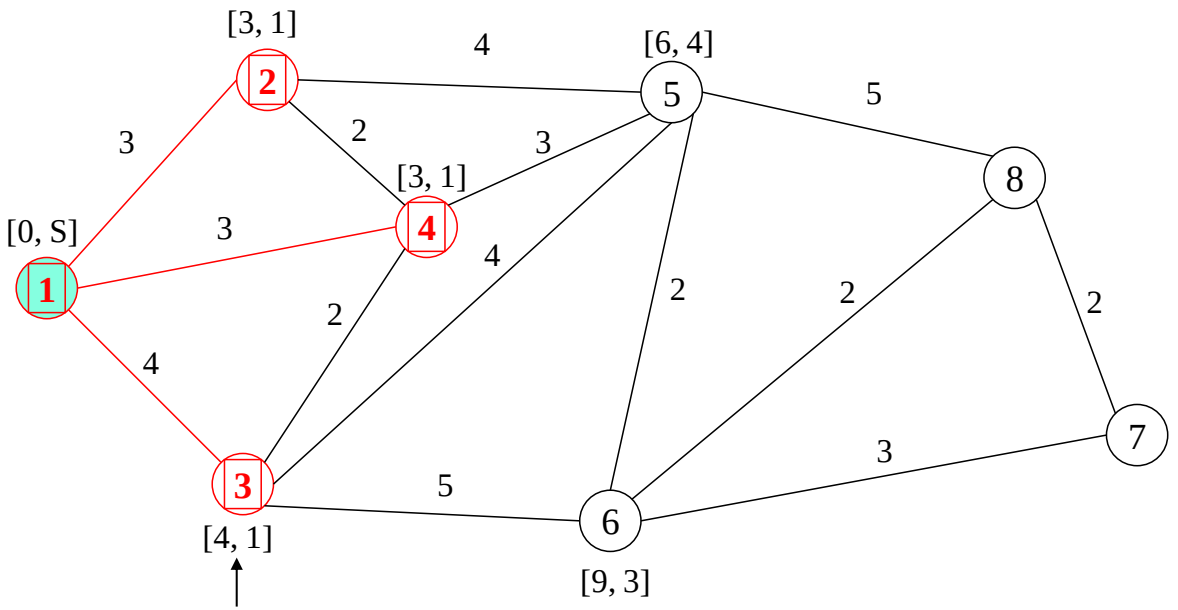
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

Node 4 is permanently labeled; temporary label at node 5 is revised



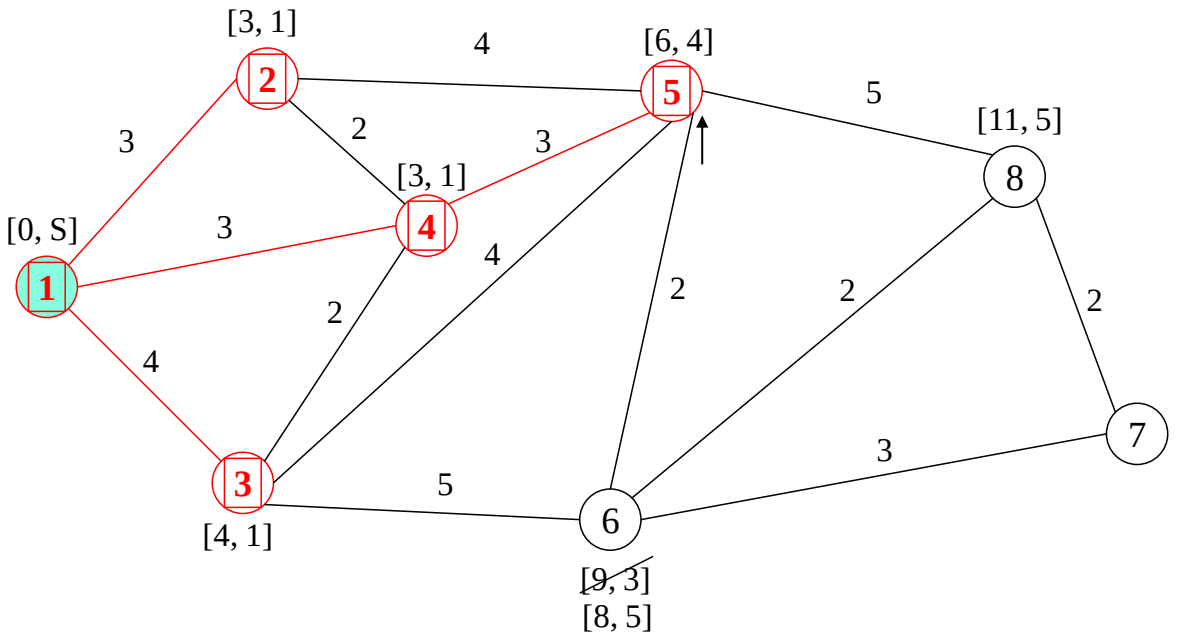
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

Node 3 is permanently labeled; node 6 is temporarily labeled



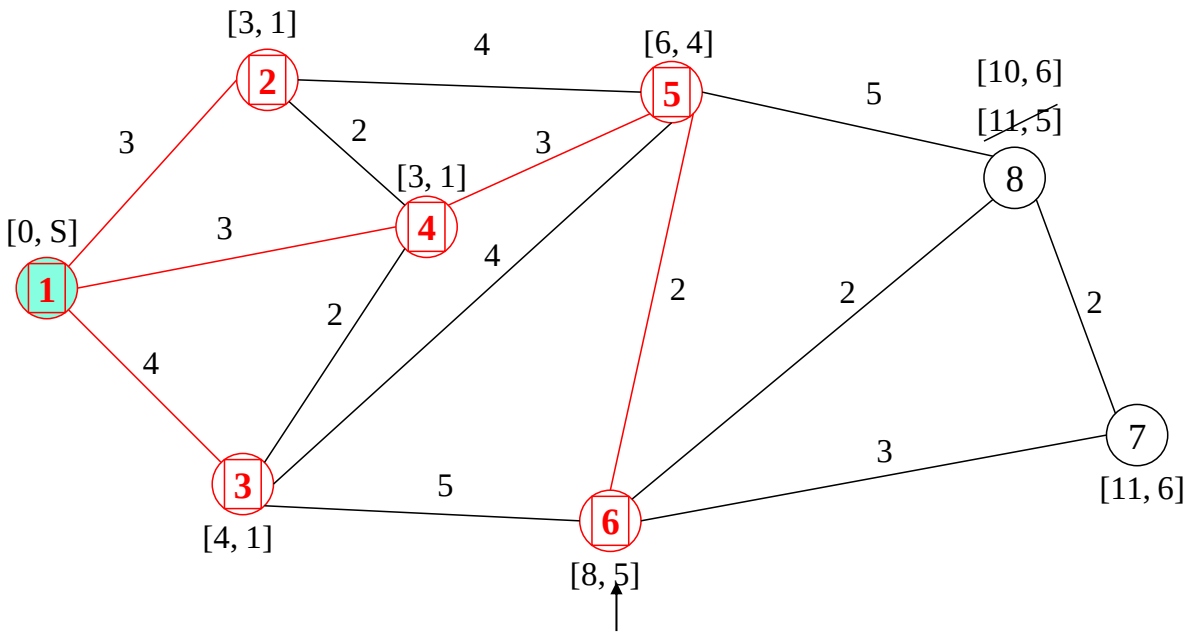
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

Node 5 is permanently labeled; temporary label at node 6 is revised; node 8 is temporarily labeled



ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

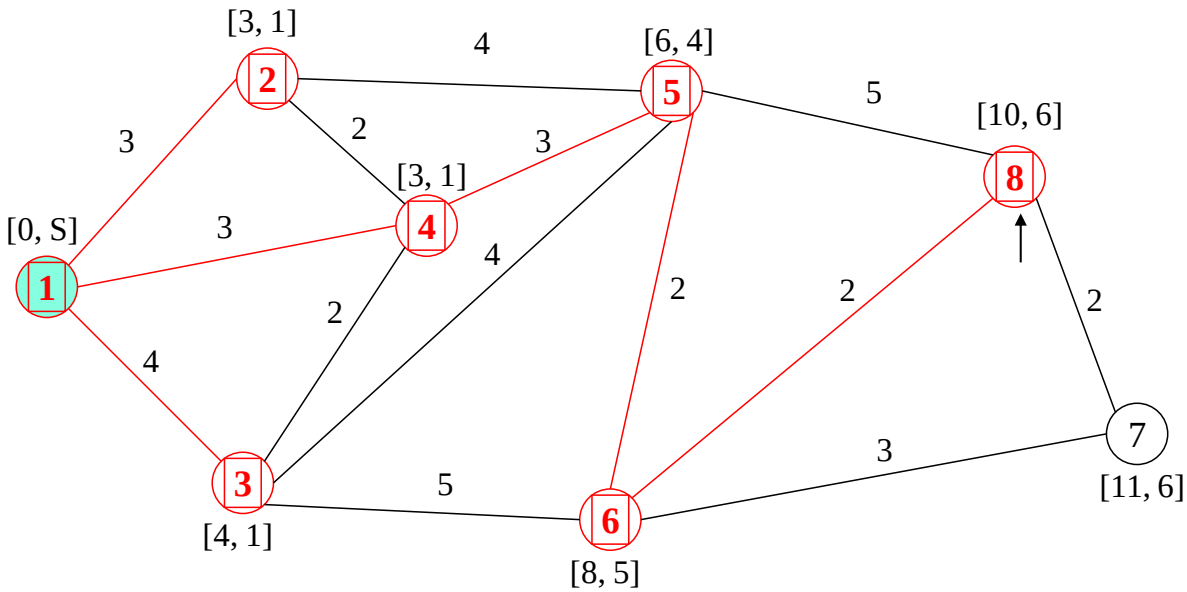
Node 6 is permanently labeled; temporary label at node 8 is revised; node 7 is temporarily labeled



24

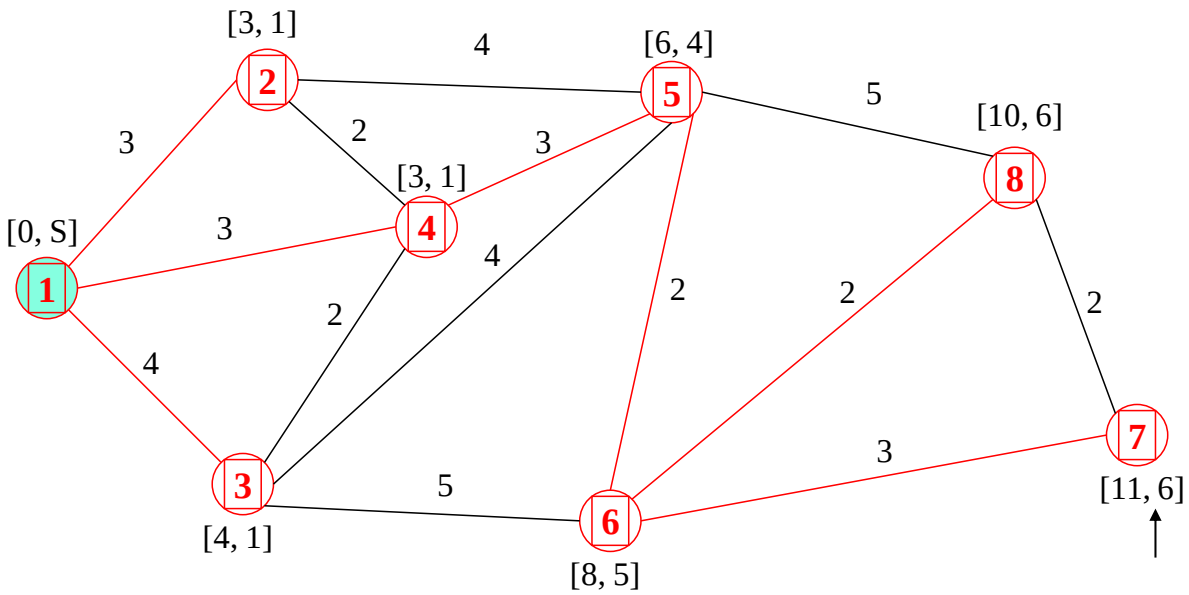
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

Node 8 is permanently labeled; no temporary labels are revised



ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

Node 7 is permanently labeled; shortest route from node 1 to all other nodes on labels



26

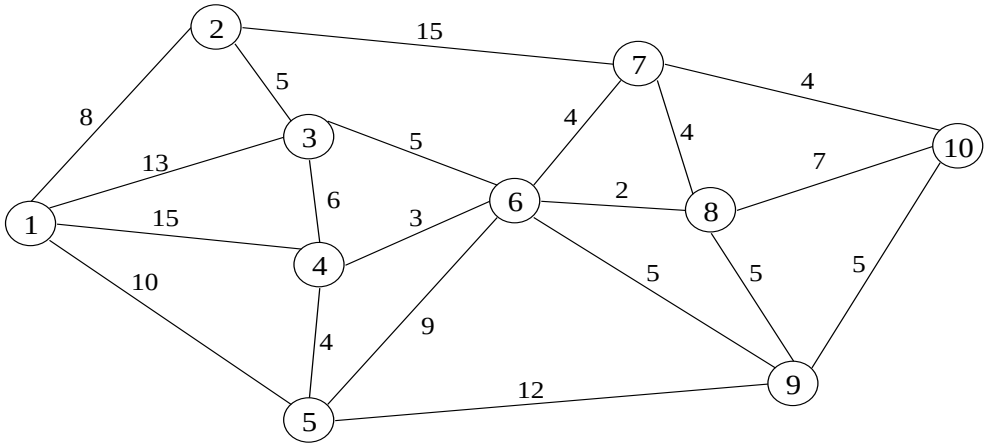
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

Node	Shortest Route From Node 1	Distance
2	1-2	3
3	1-3	4
4	1-4	3
5	1-4-5	6
6	1-4-5-6	8
7	1-4-5-6-7	11
8	1-4-5-6-8	10

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

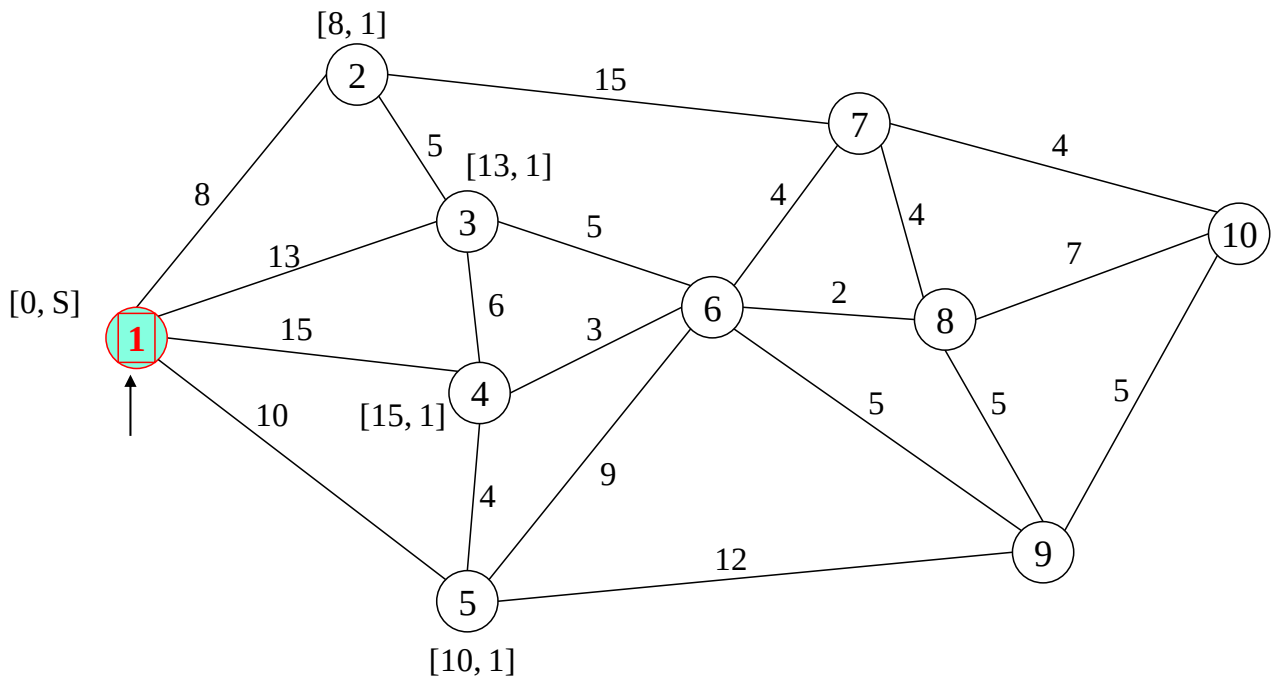
Problem Description

City Cab Company has identified 10 primary pickup and drop locations for cab riders in New York City. In an effort to minimize travel time and improve customer service and the utilization of the company's fleet of cabs, management would like the cab drivers to take the shortest route between locations whenever possible. Using the network of roads and streets shown below, what is the route a driver beginning at location 1 should take to reach location 10? The travel times in minutes are shown on the arcs of the network.

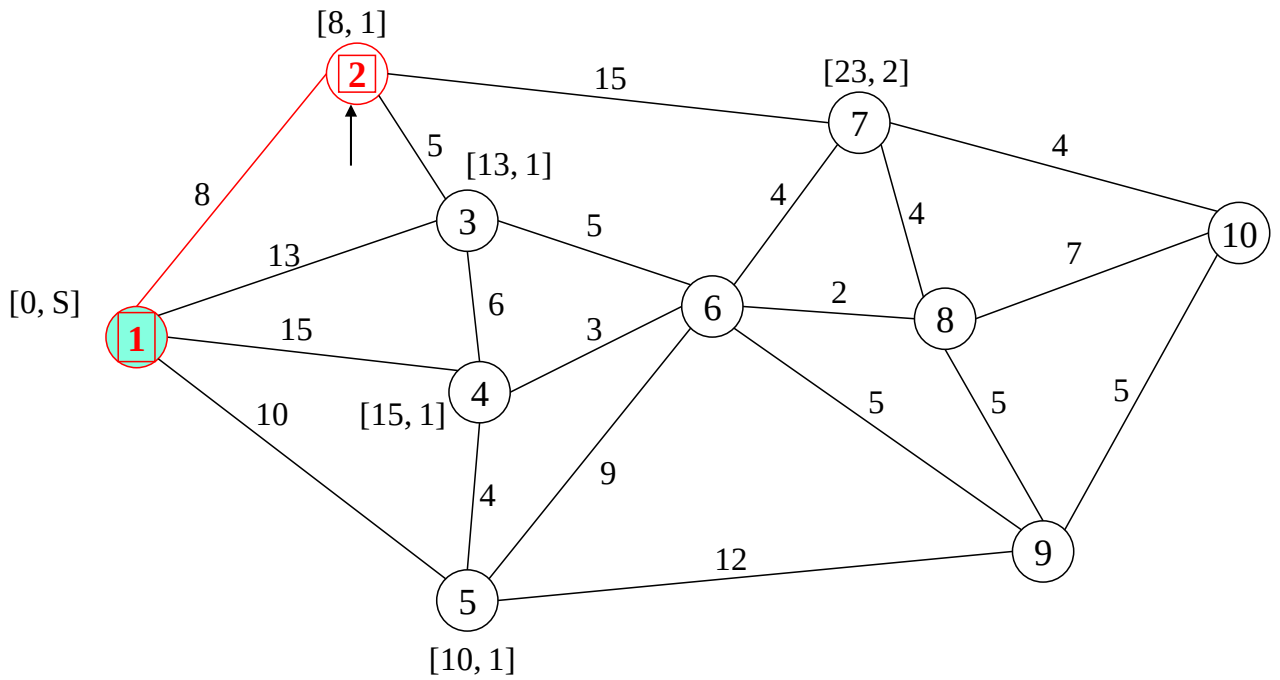


28

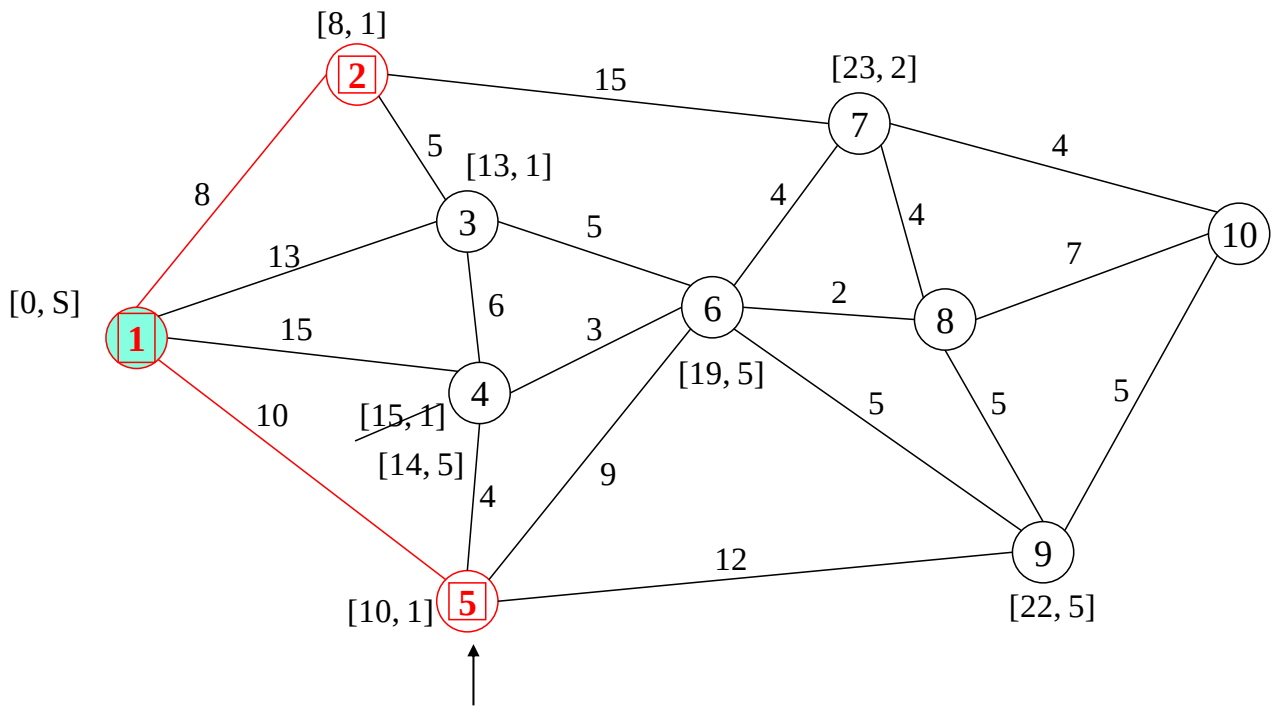
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM



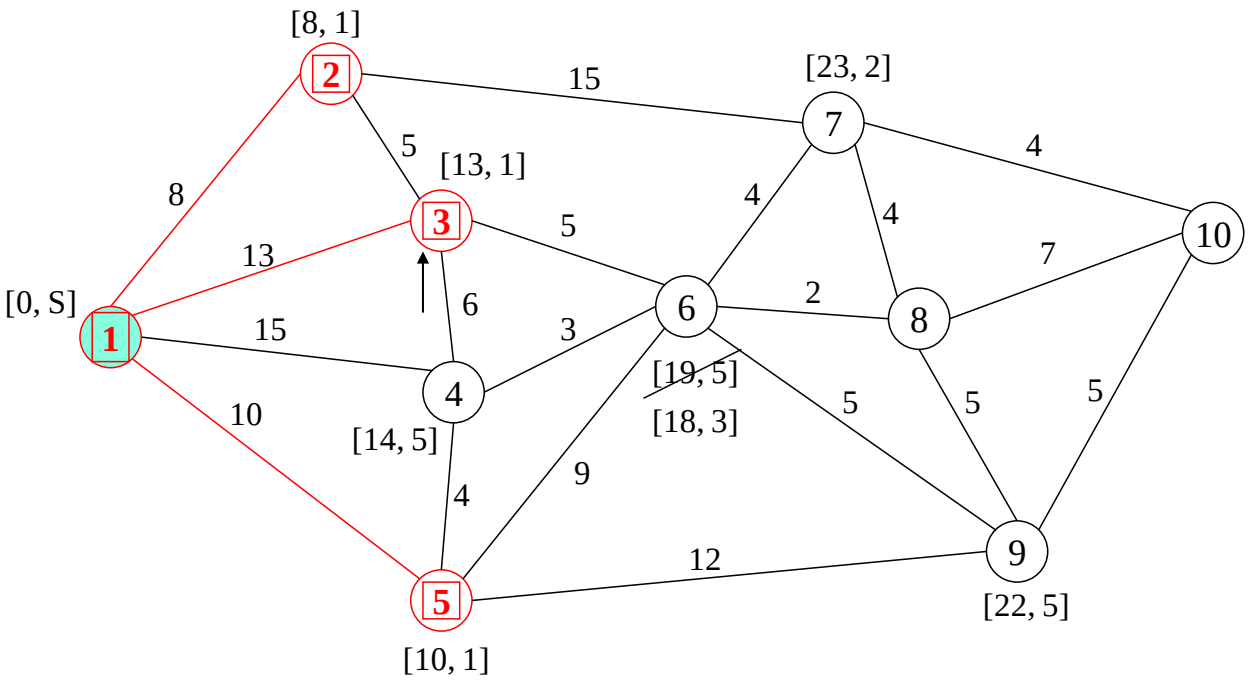
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM



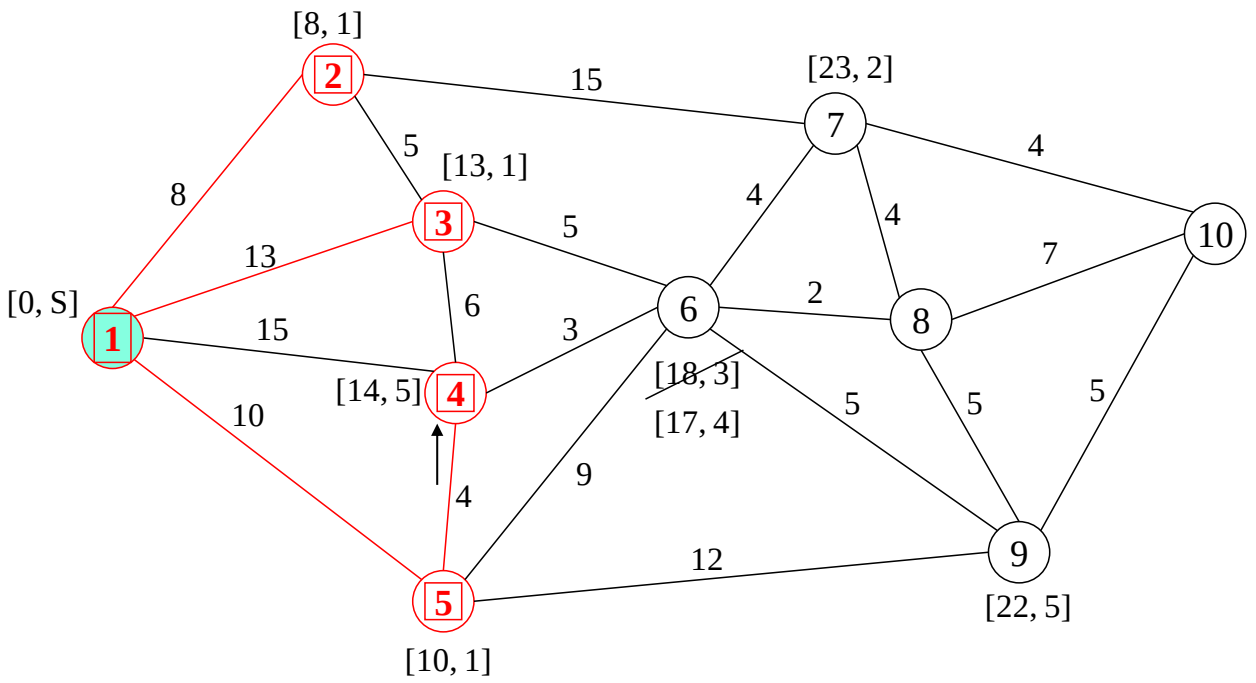
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM



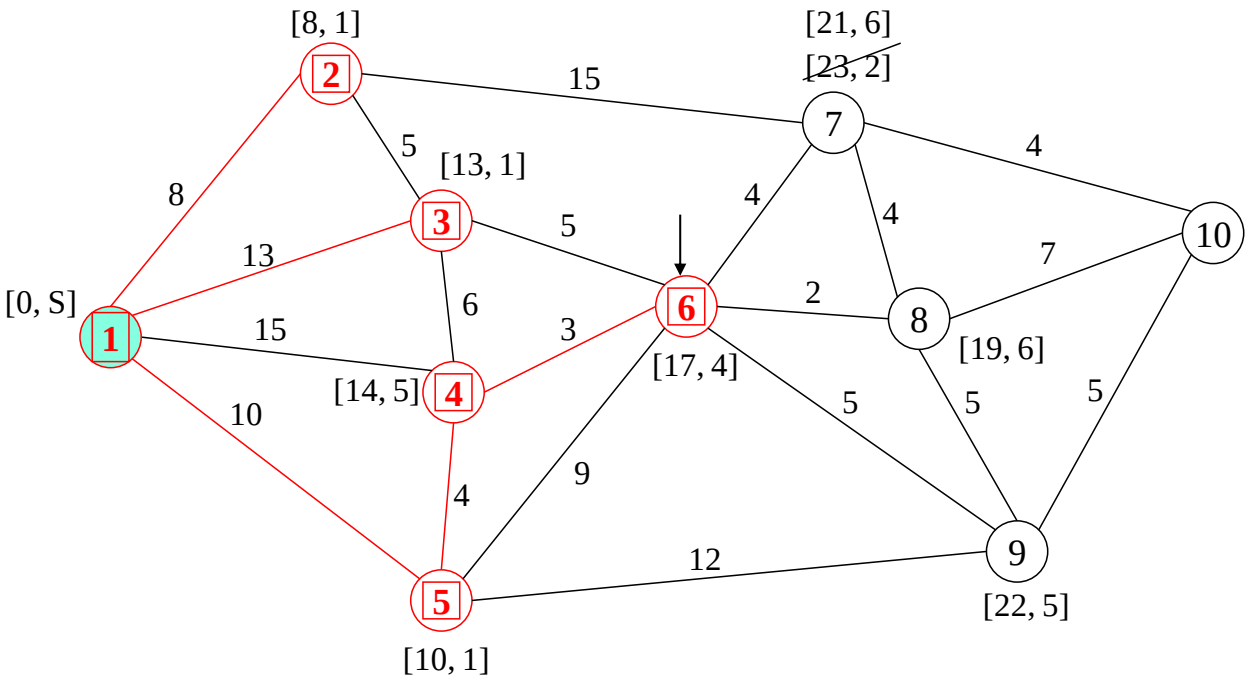
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM



ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

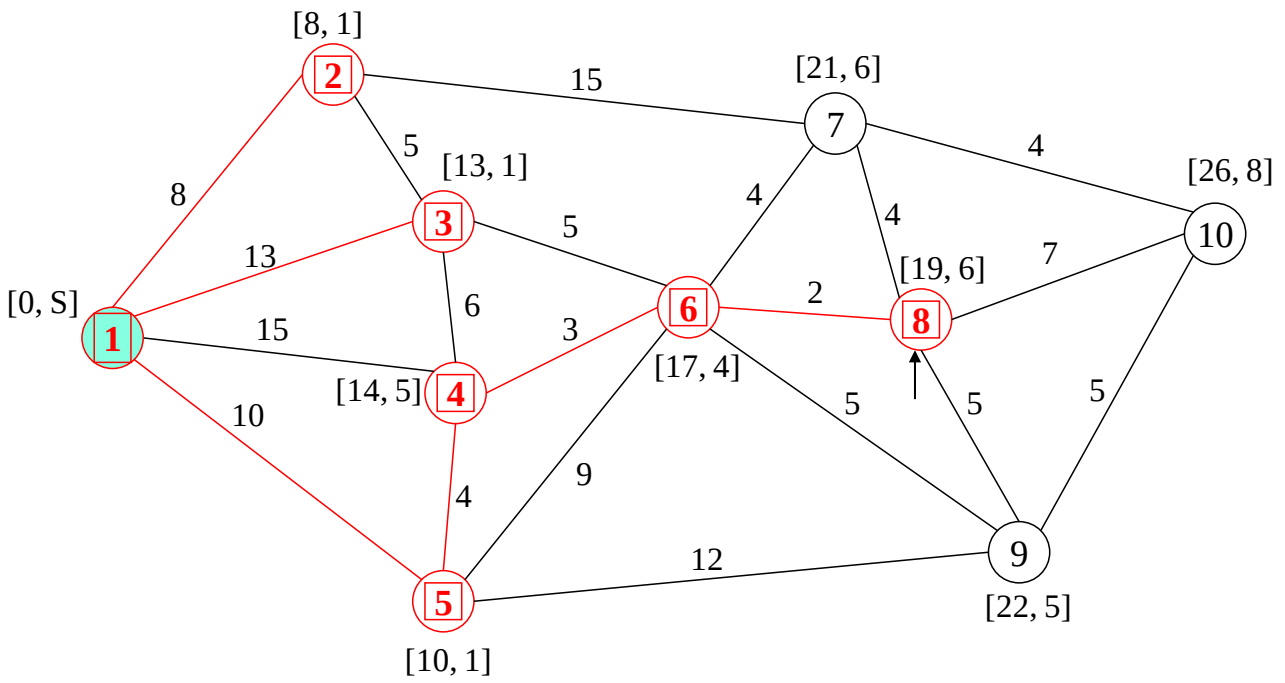


ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

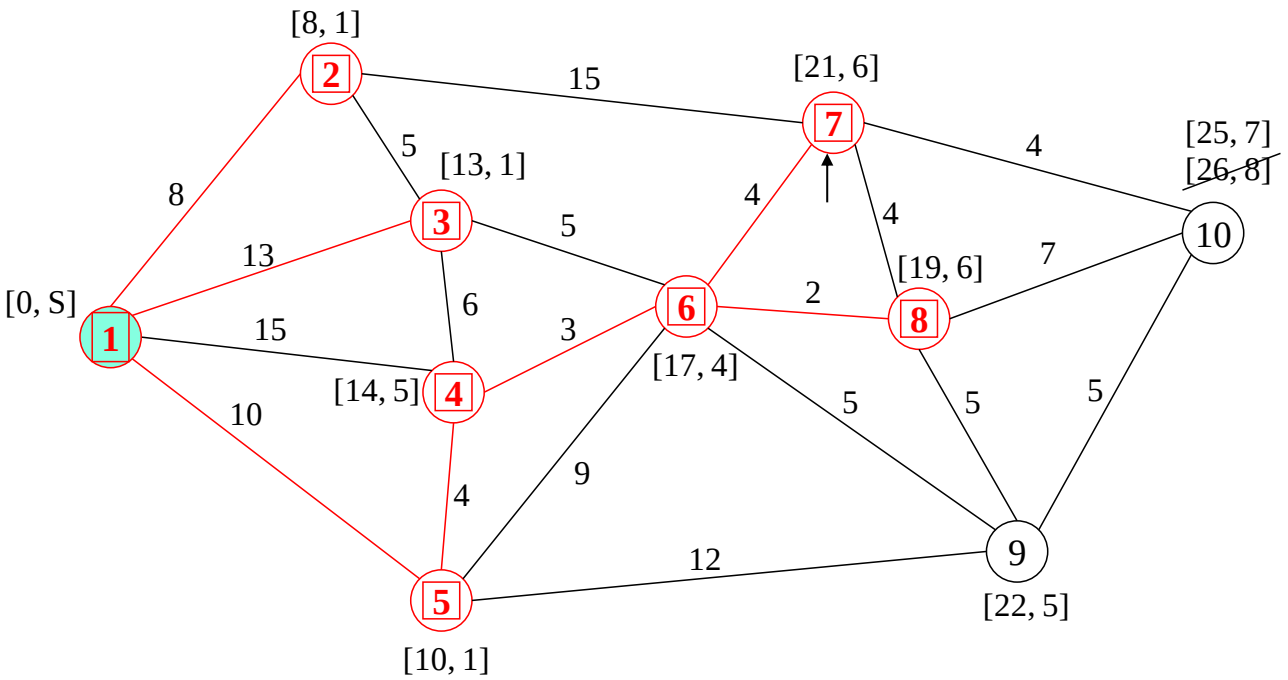


34

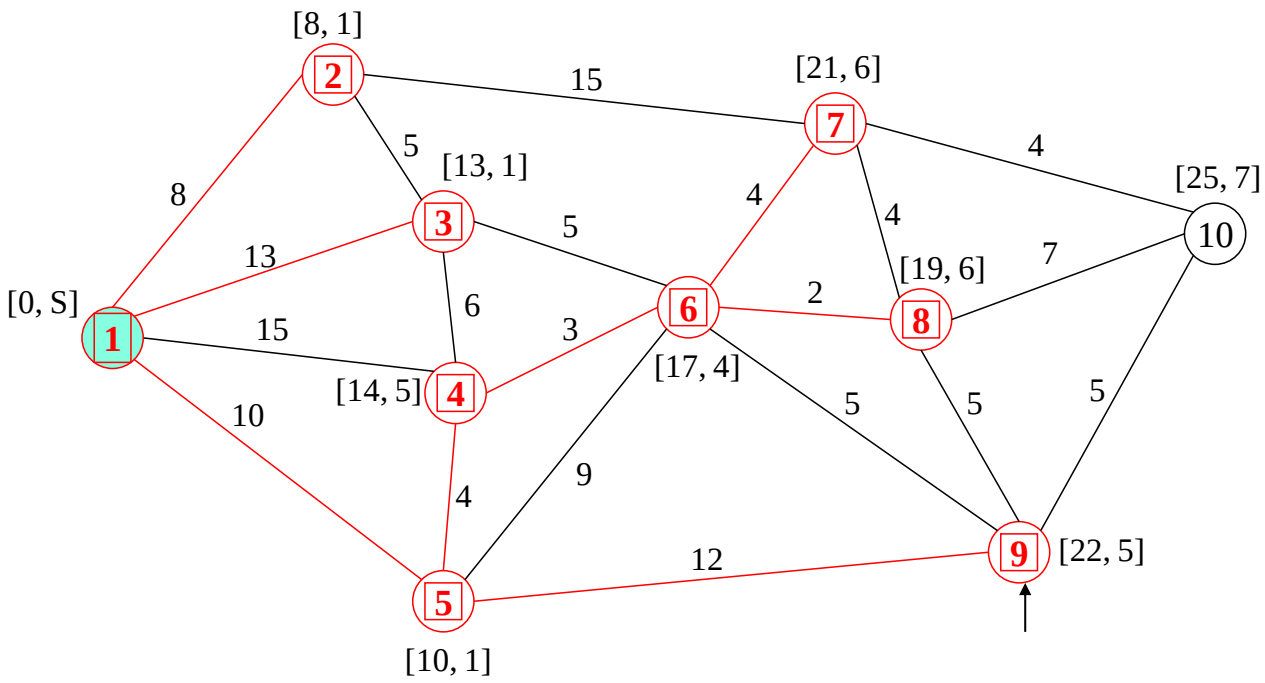
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM



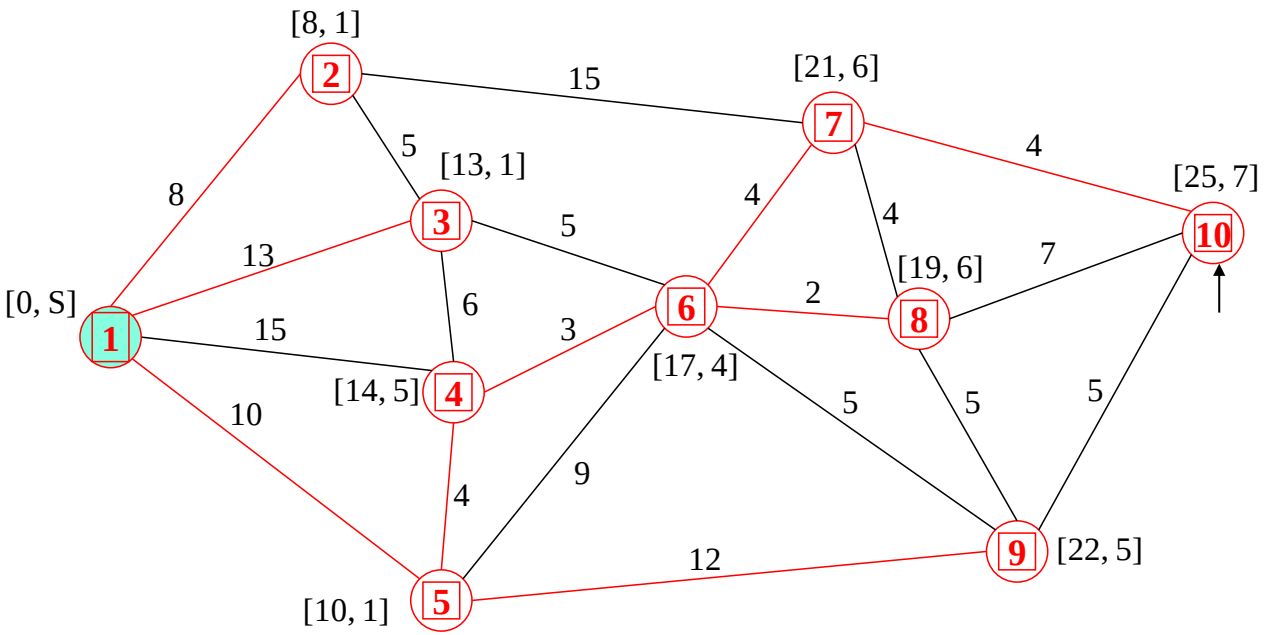
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM



ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM



ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM



Συντομότερη διαδρομή / Shortest Route: 1 - 5 - 4 - 6 - 7 - 10

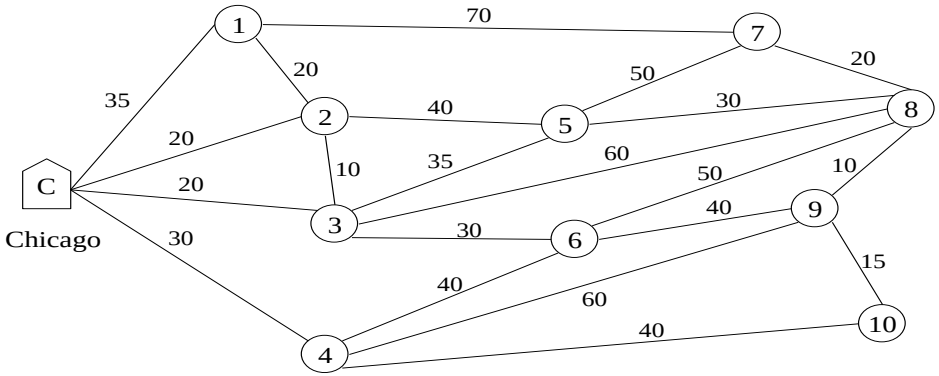
Χρόνος / Time: 10 + 4 + 3 + 4 + 4 = 25

38

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

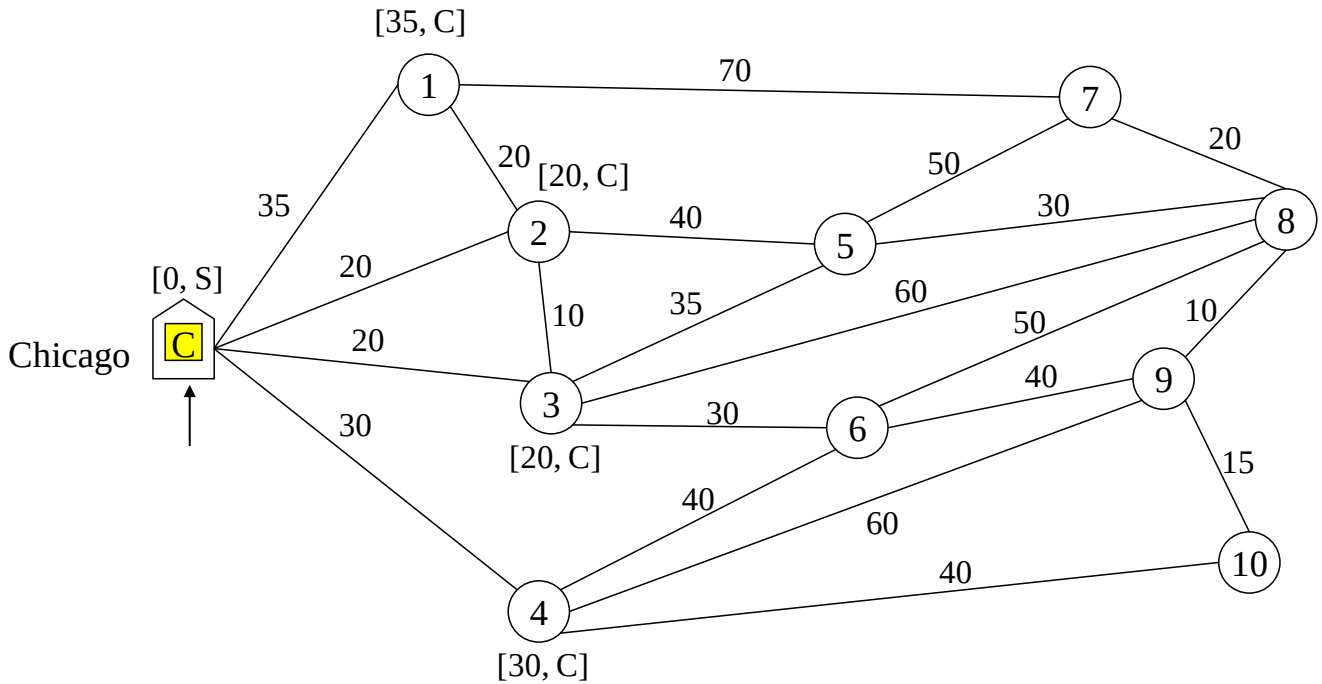
Problem Description

Morgan Trucking Company operates a special fast-service pickup and delivery service between Chicago and 10 other cities located in a four-state area. When Morgan receives a request for service, it dispatches a truck from Chicago to the city requesting service as soon as possible. Since both fast service and minimum travel costs are objectives for Morgan, it is important that the dispatched truck take the shortest route from Chicago to the specified city. Assume that the following network (not drawn to scale) with distances given in miles represents the highway network for this problem:



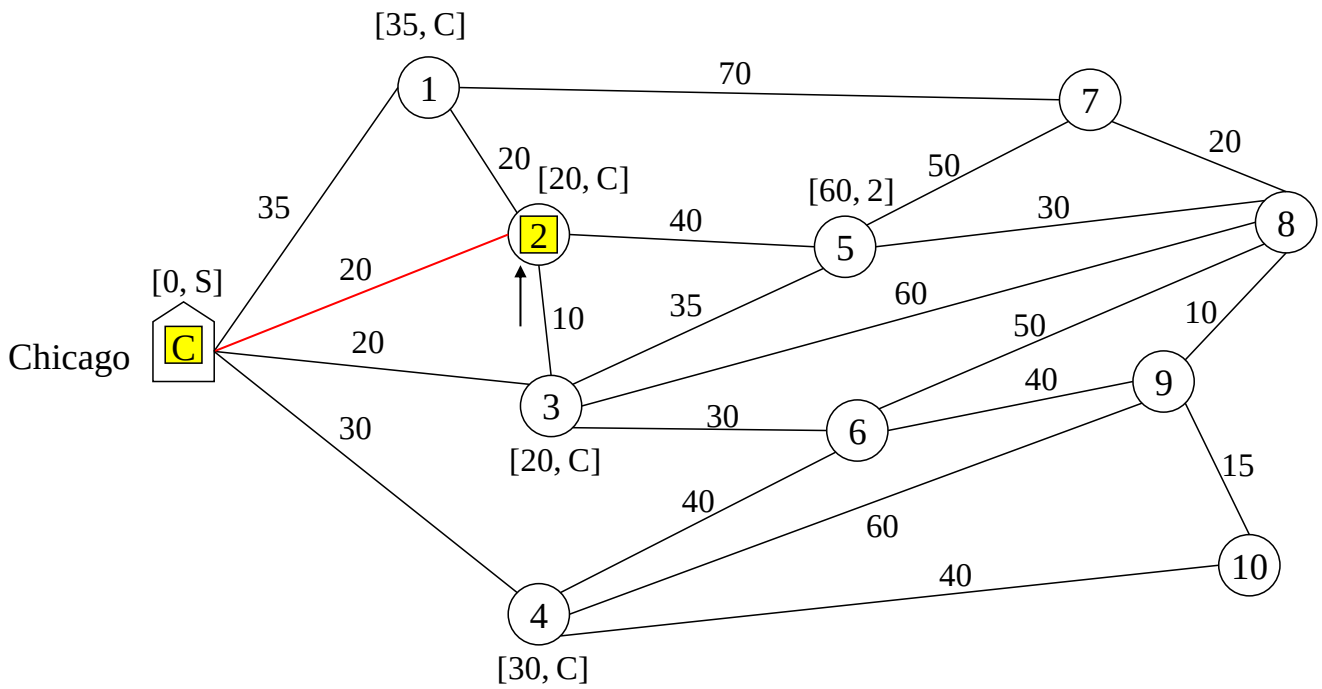
a. Find the shortest-route distances from Chicago to all 10 cities.

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

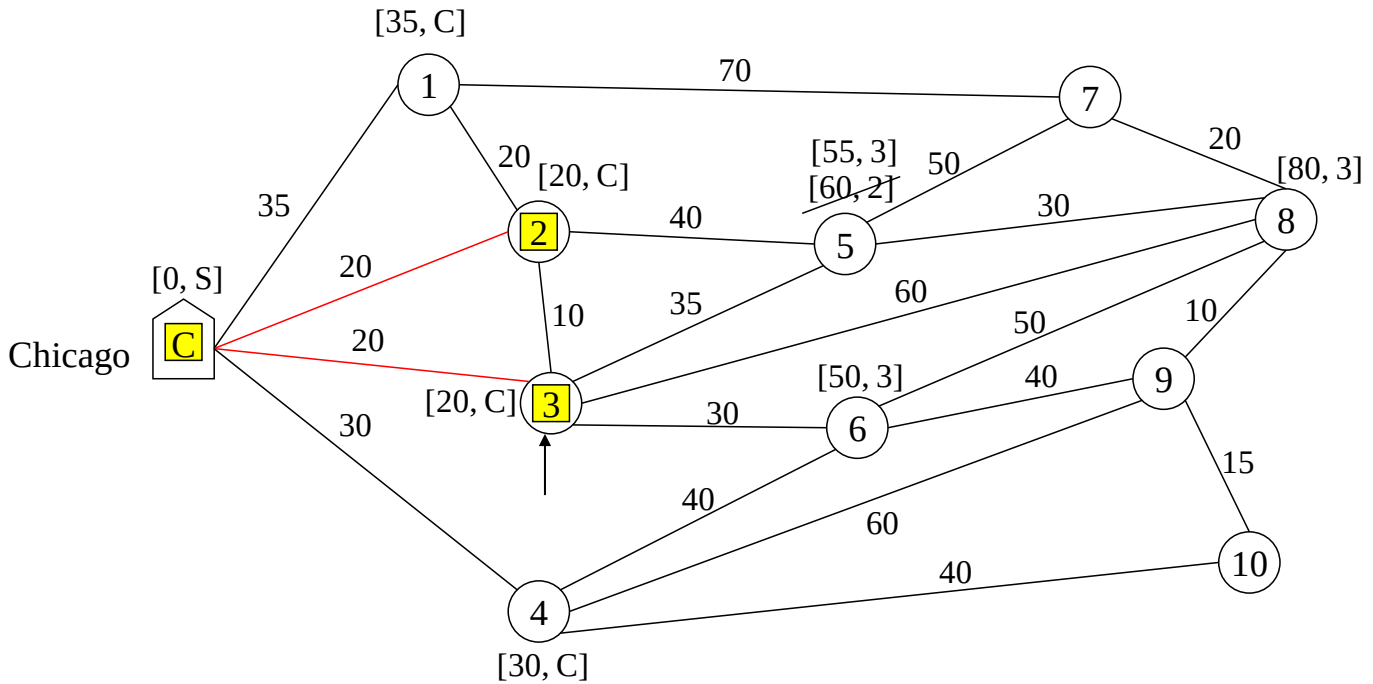


40

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

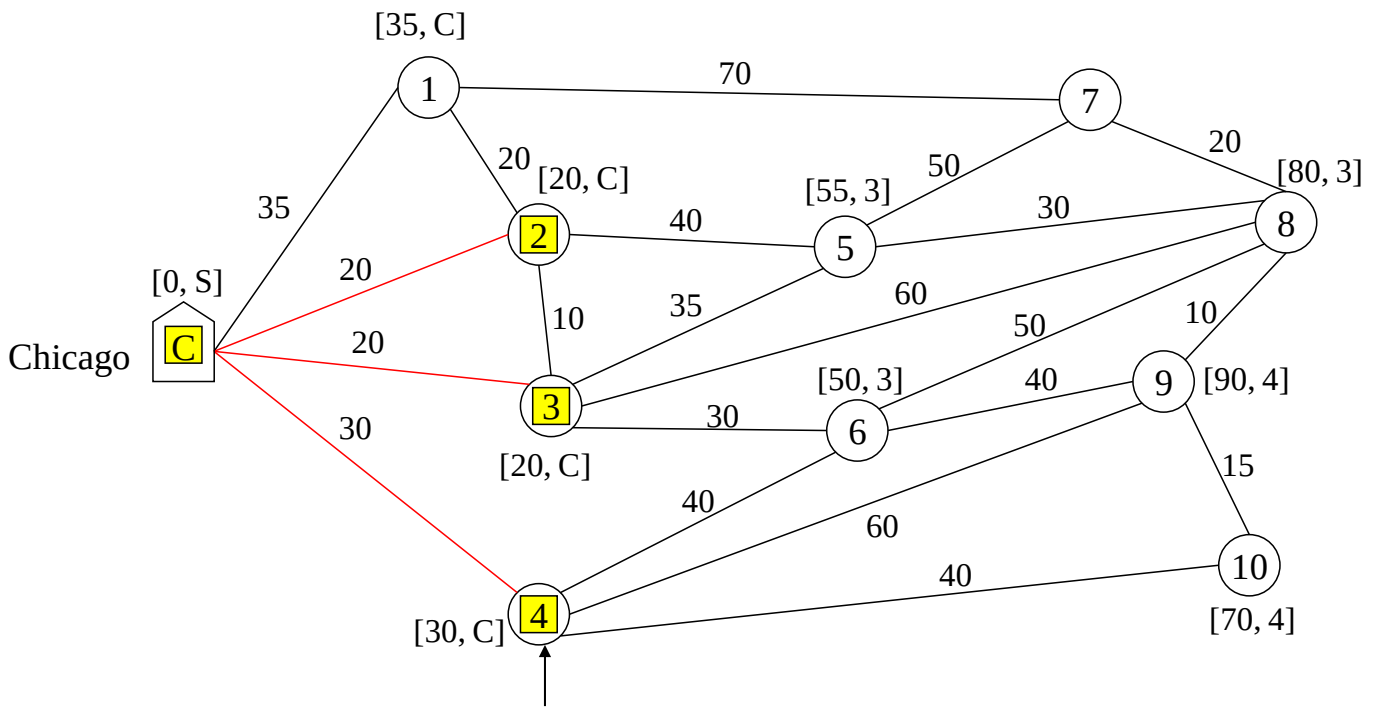


ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

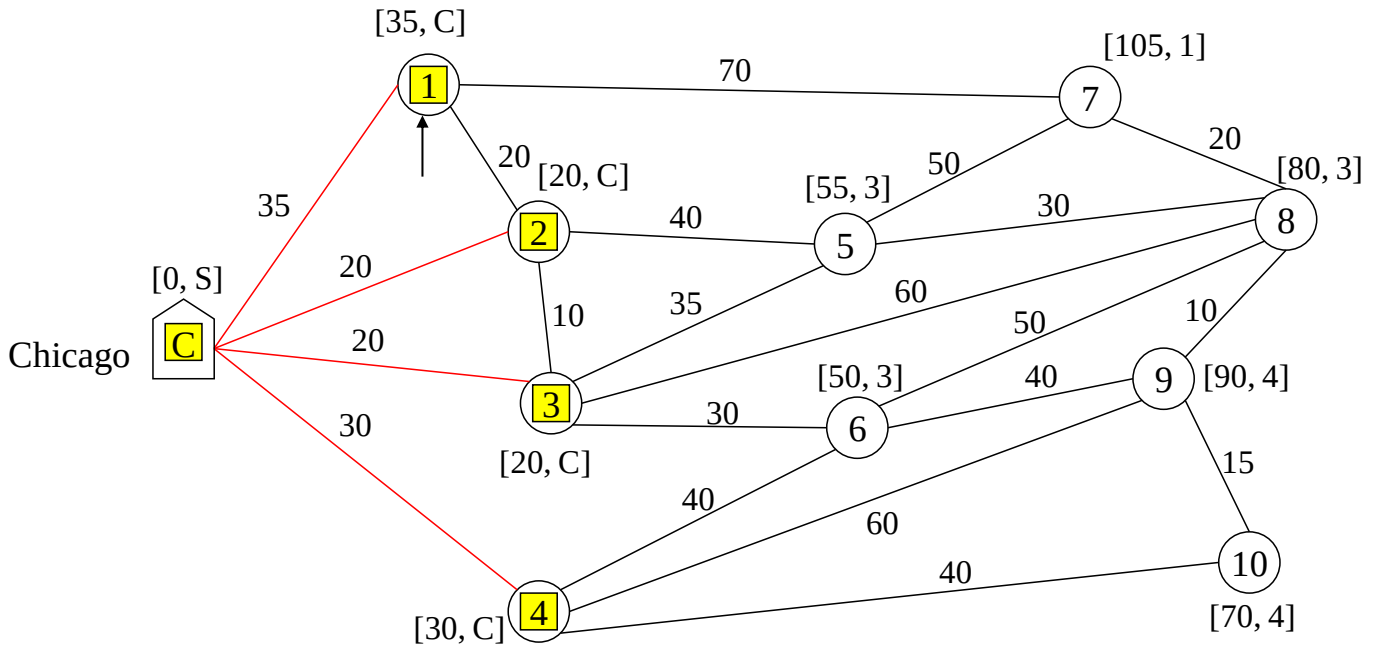


42

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM



ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM



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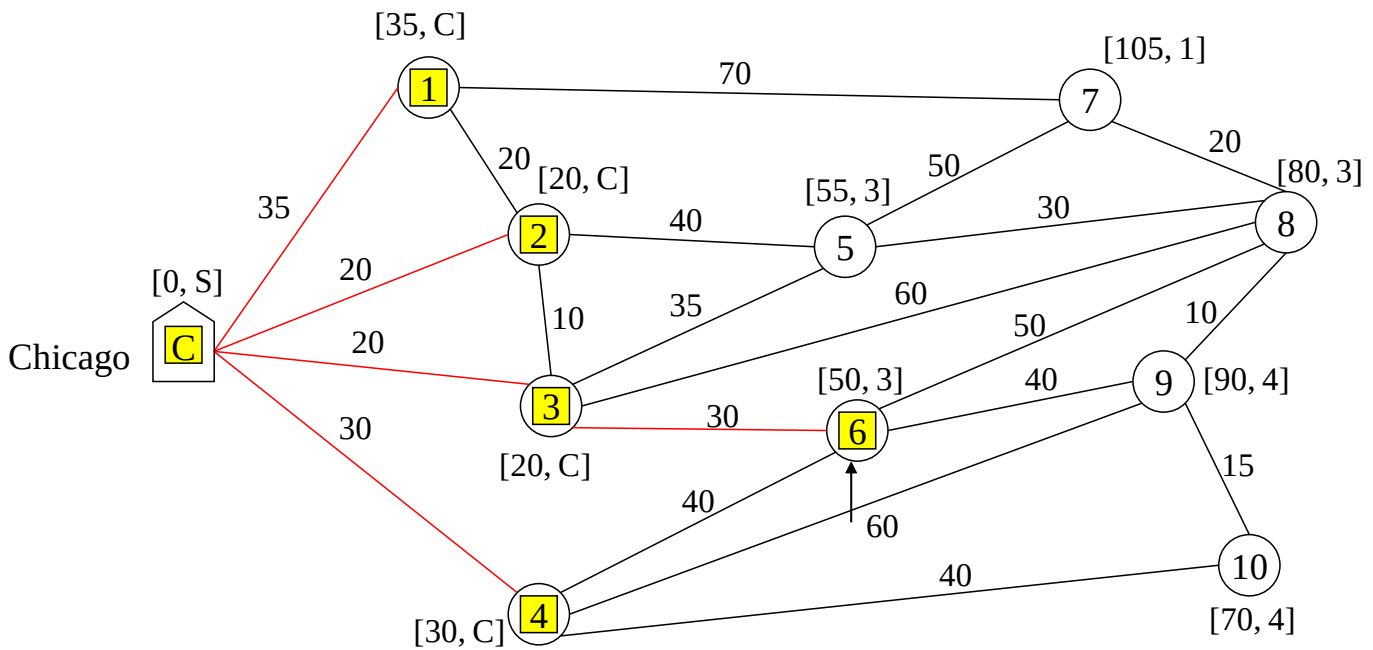
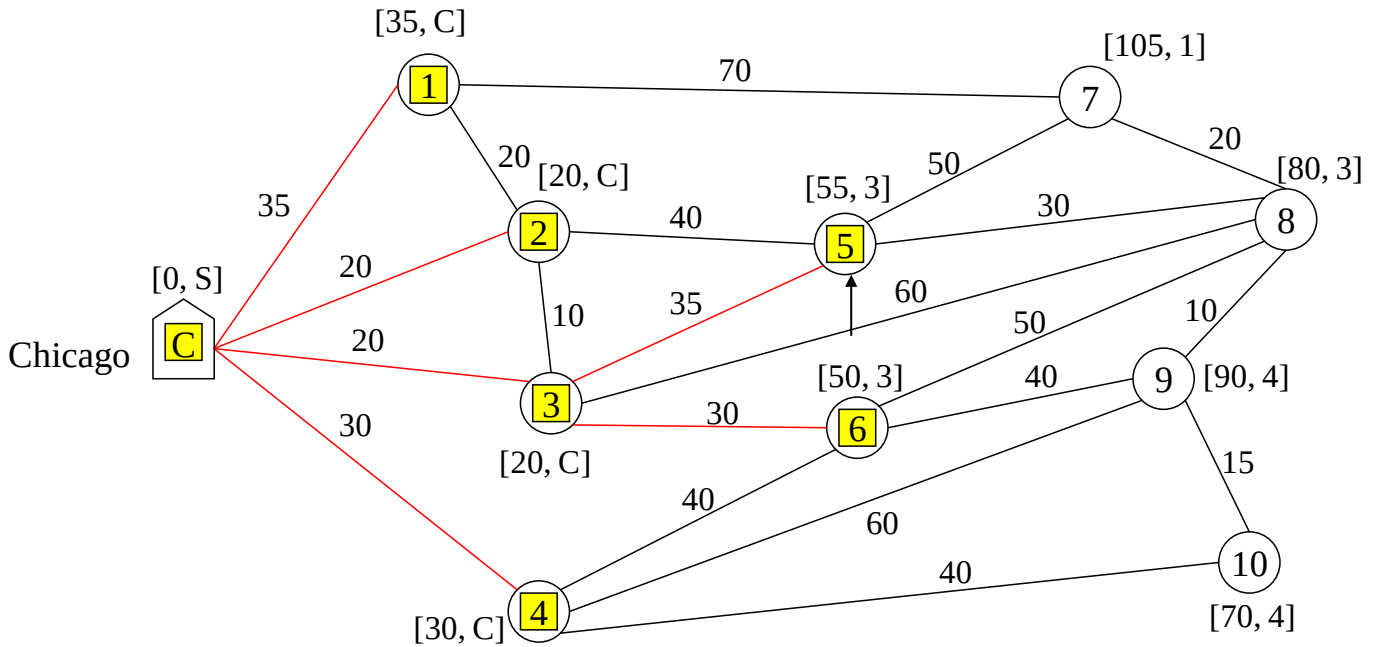
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

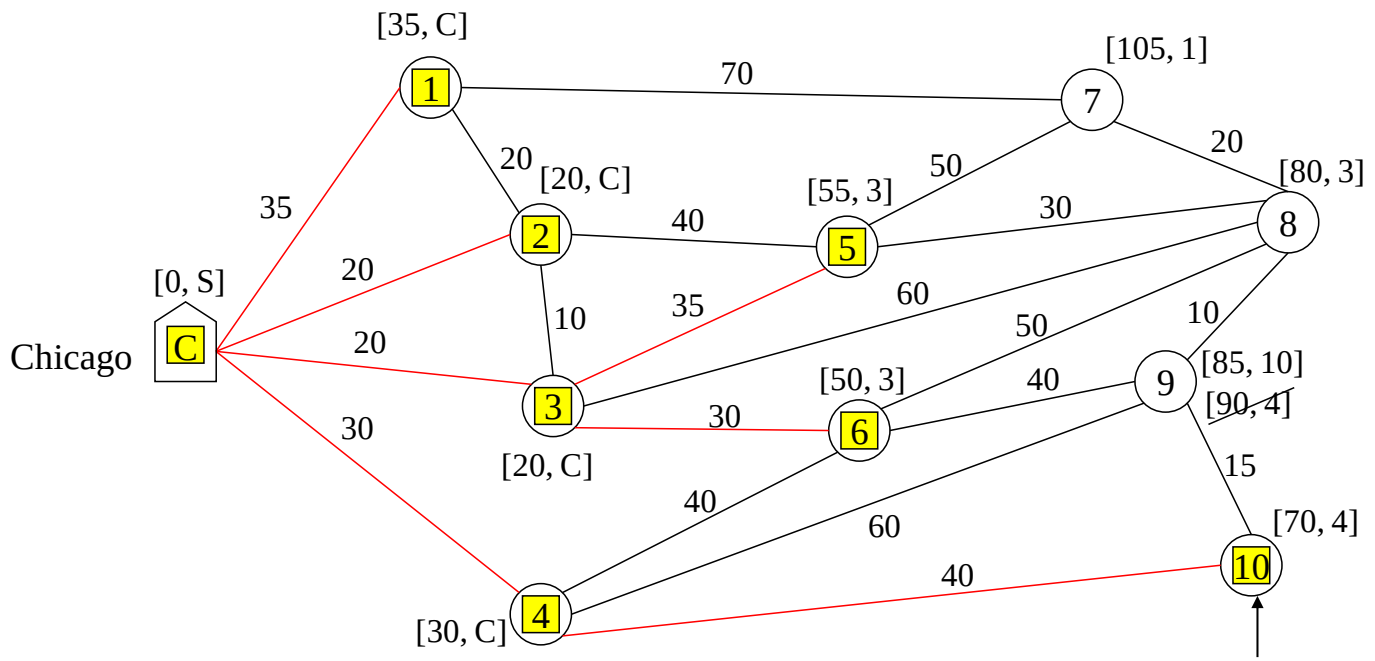


ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

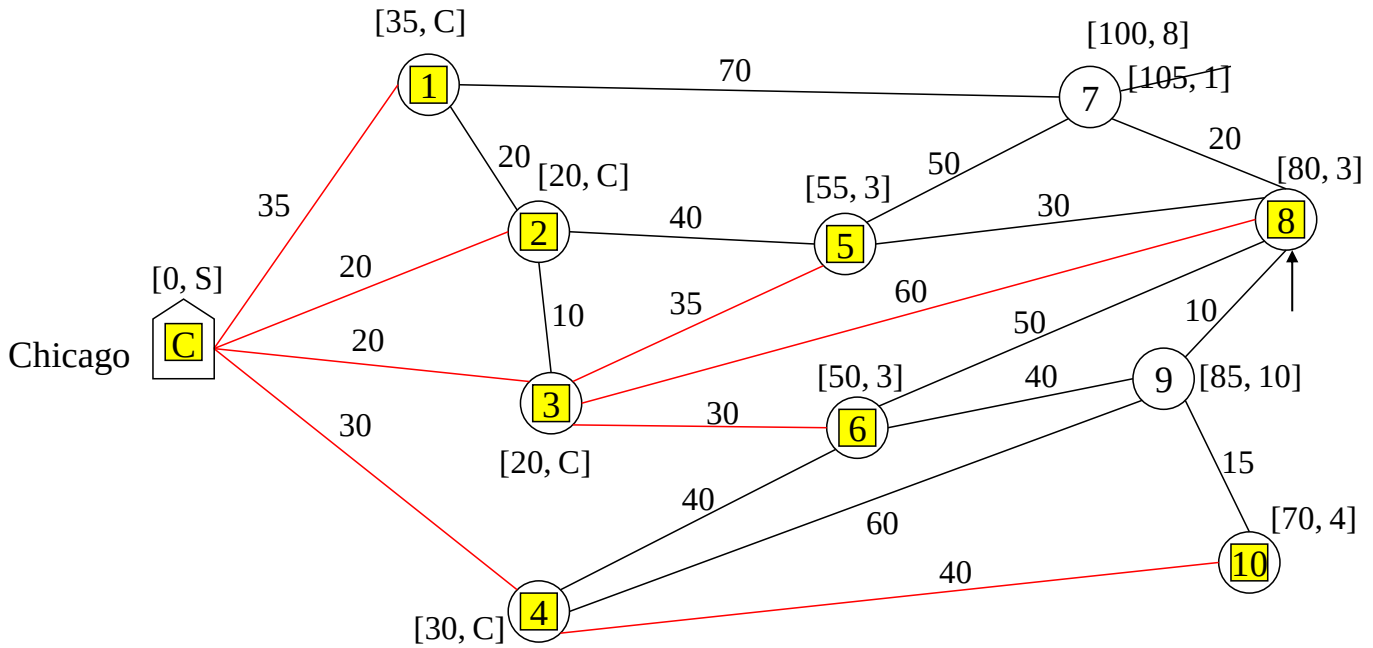


46

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

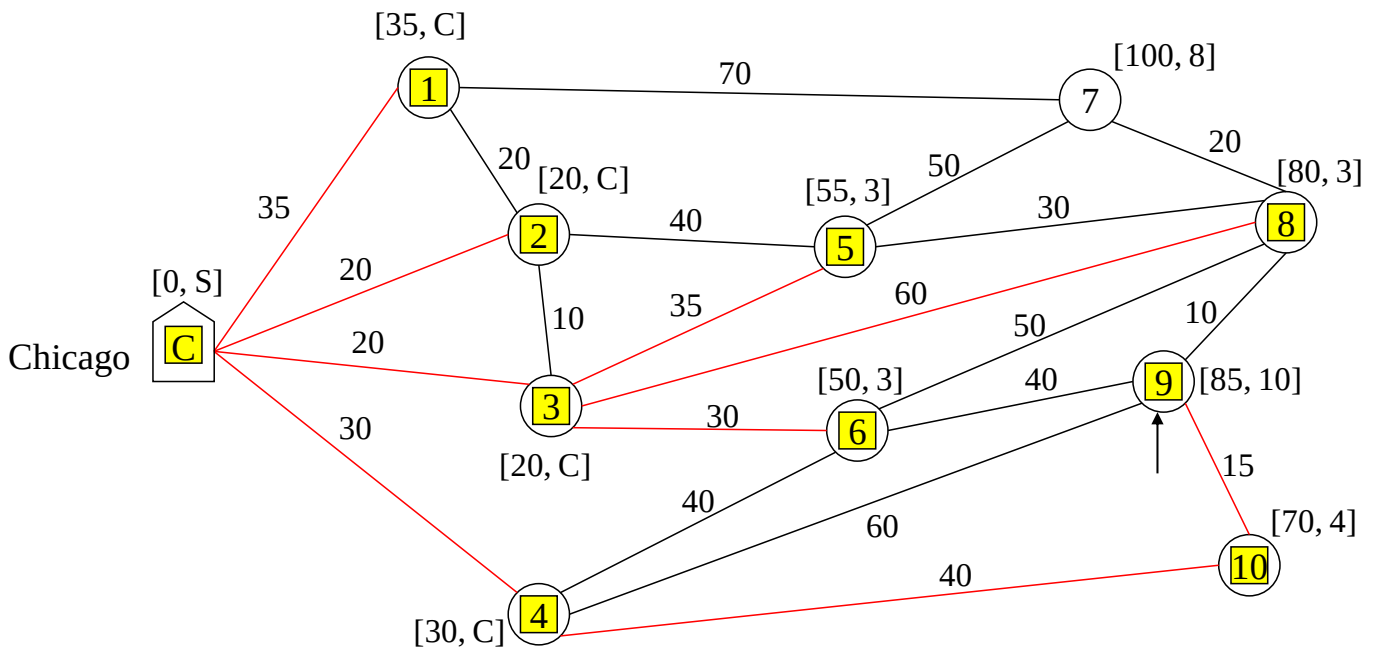


ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

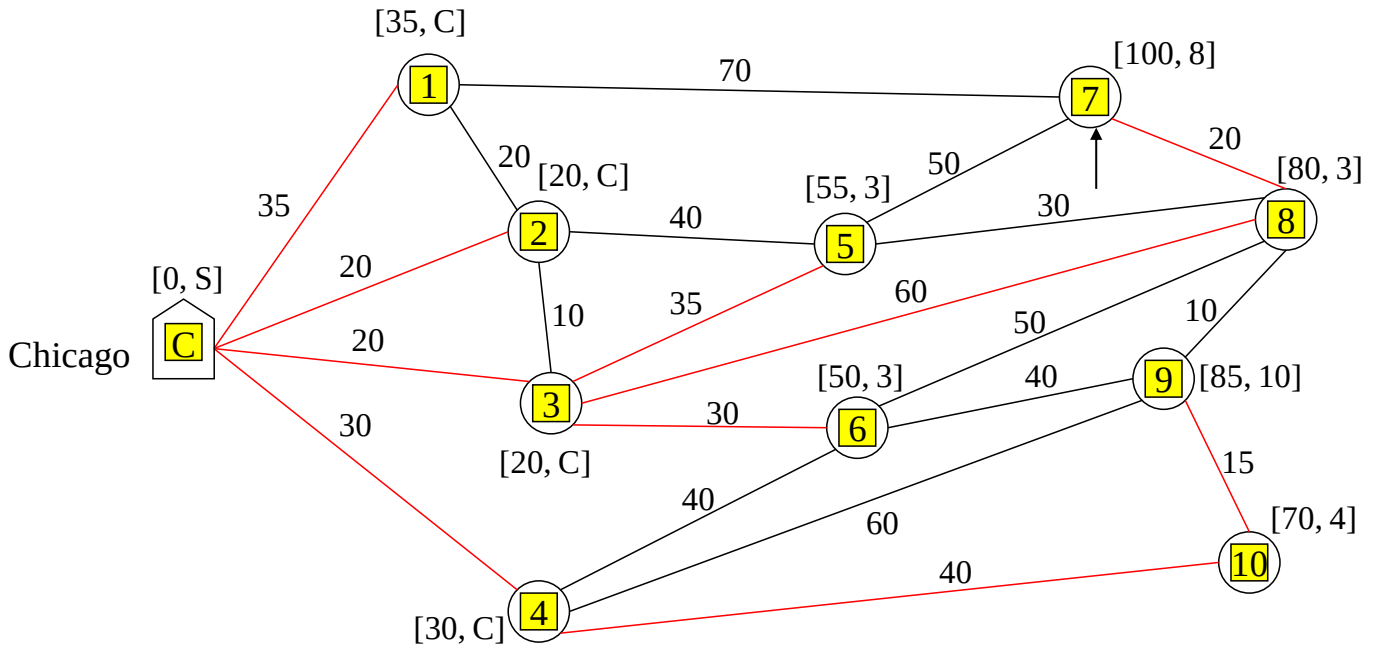


48

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM



ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM



50

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΗΣ ΔΙΑΔΡΟΜΗΣ
SHORTEST-ROUTE PROBLEM

Node	Shortest Route From Node C	Distance
1	C-1	35
2	C-2	20
3	C-3	20
4	C-4	30
5	C-3-5	55
6	C-3-6	50
7	C-3-8-7	100
8	C-3-8	80
9	C-4-10-9	85
10	C-4-10	70

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

- Το Πρόβλημα του ***Ελαχίστου Ζευγνύοντος Δένδρου*** περιλαμβάνει τη χρήση των τόξων του δικτύου για να 'ενώσουμε' όλους τους κόμβους στο δίκτυο ελαχιστοποιώντας το συνολικό μήκος των τόξων.

  – The ***minimal spanning tree*** problem involves using the arcs of the network to reach all nodes of the network in such a fashion such that the total length of all the arcs is minimized.

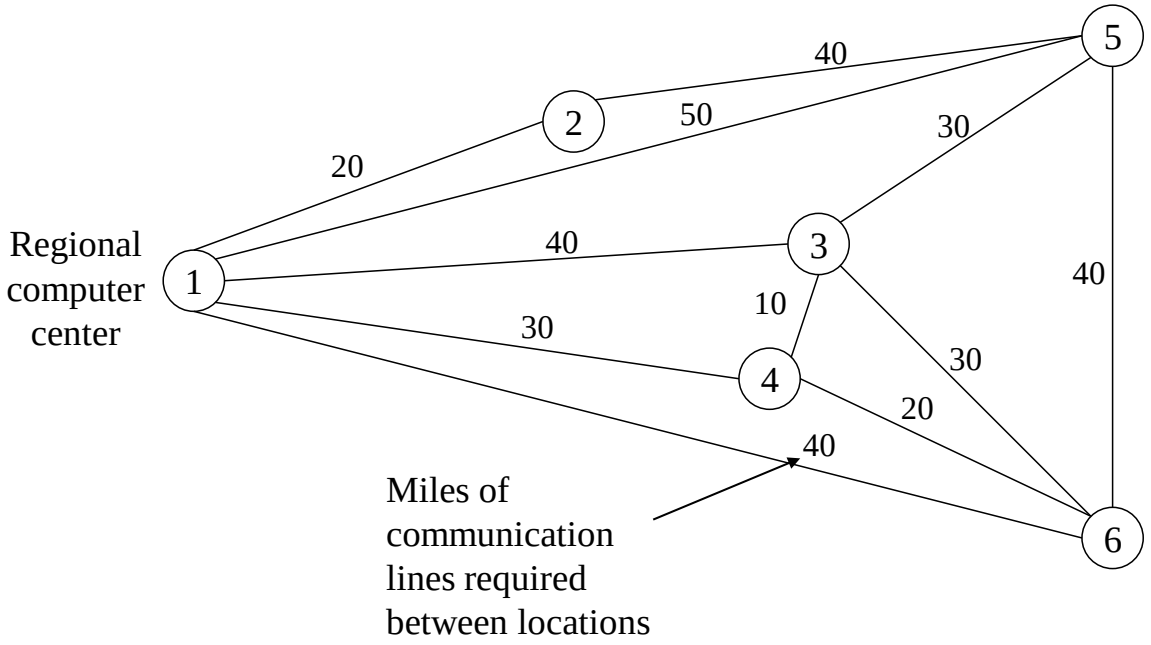
52

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

Step 1 Arbitrarily begin at any node and connect it to the closest node in terms of the criterion being used (e.g. time, cost, or distance). The two nodes are referred to as *connected* nodes, and the remaining nodes are referred to as *unconnected* nodes.

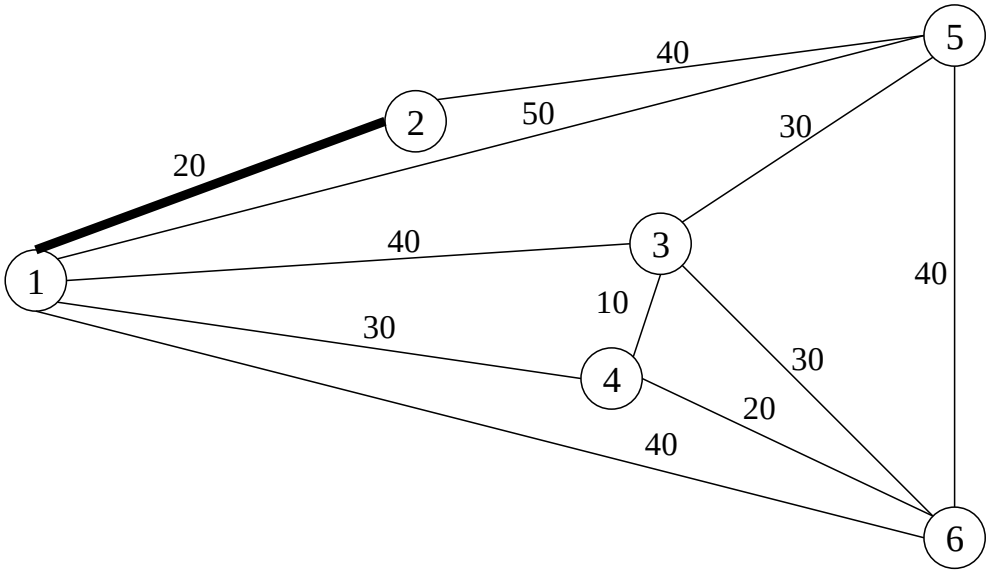
Step 2 Identify the unconnected node that is closest to one of the connected nodes. Break ties arbitrarily if two or more nodes qualify as the closest node. Add this new node to the set of connected nodes. Repeat this step until all nodes have been connected.

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

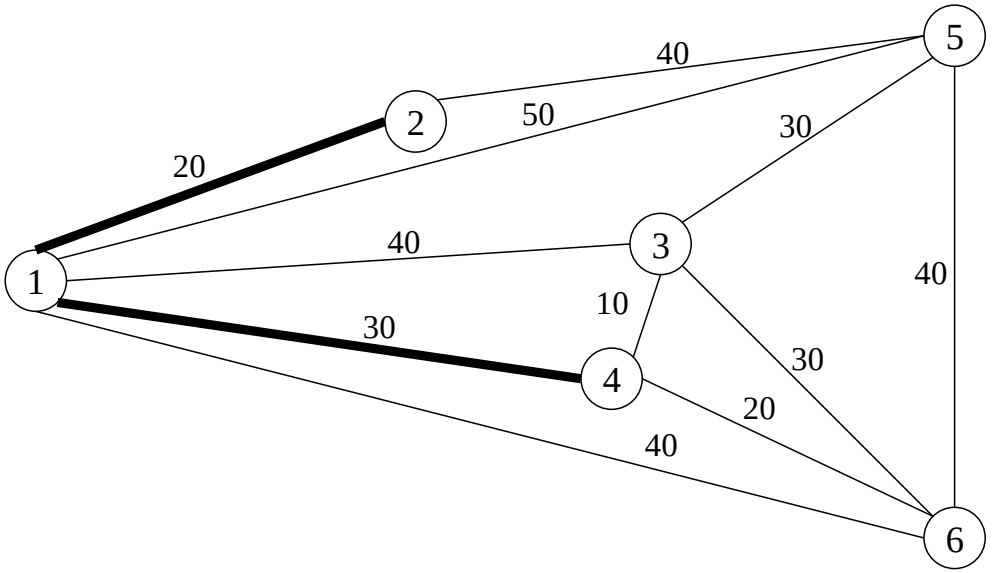


54

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

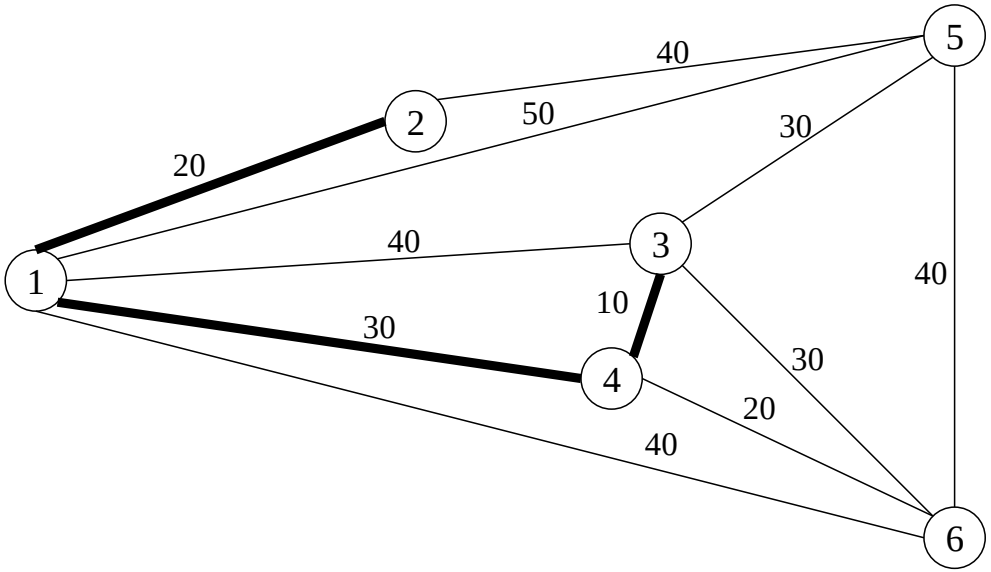


ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

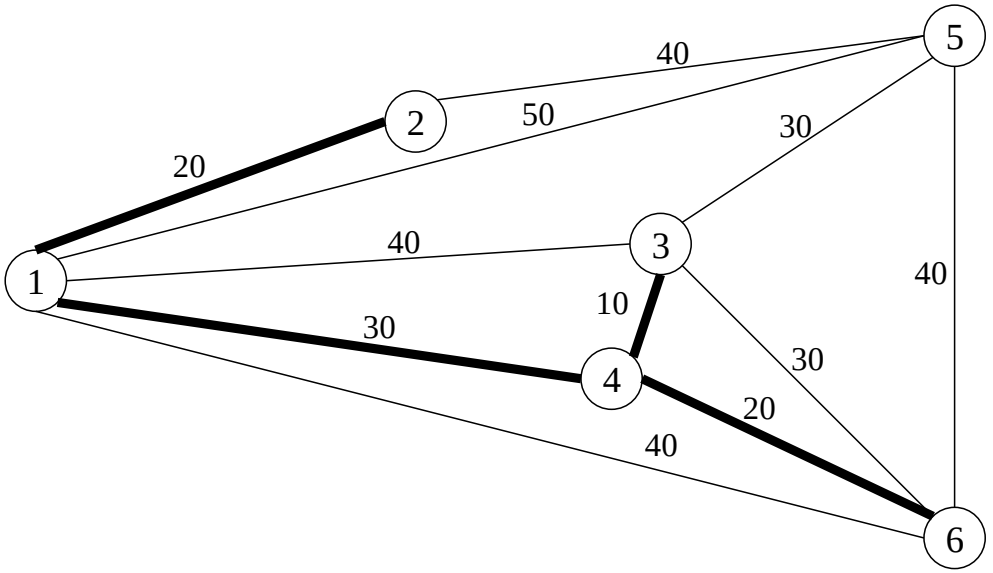


56

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

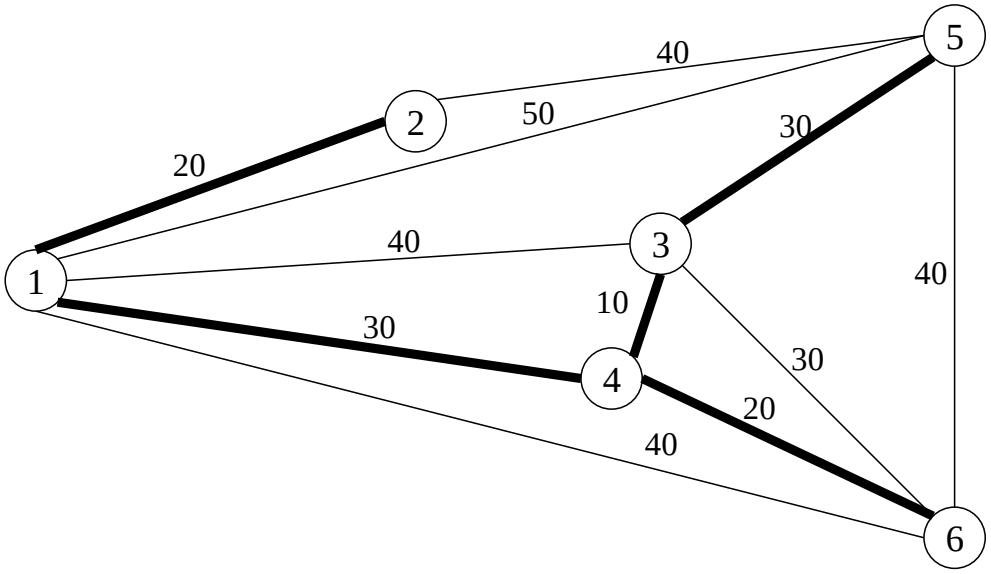


ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM



58

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM



Κόστος / Cost = 20 + 30 + 10 + 20 + 30 = 110

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

**** NETWORK DESCRIPTION ****

6 NODES AND 11 ARCS

ARC	START NODE	END NODE	DISTANCE
1	1	2	20
2	1	3	40
3	1	4	30
4	1	5	50
5	1	6	40
6	2	5	40
7	3	4	10
8	3	5	30
9	3	6	30
10	4	6	20
11	5	6	40

60

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

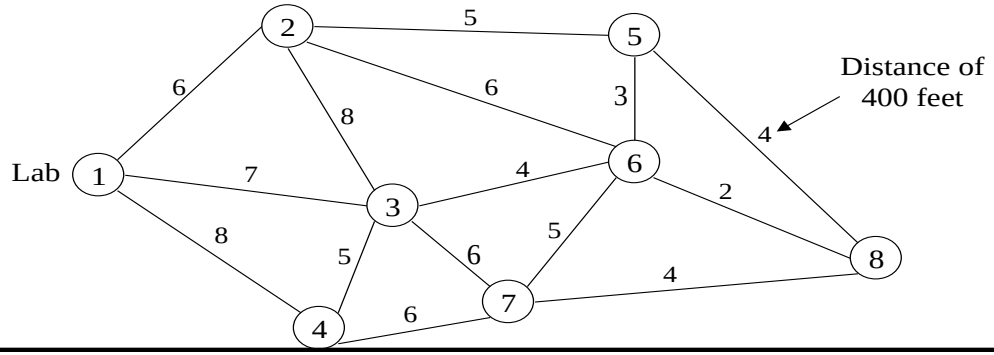
MINIMAL SPANNING TREE
****

START NODE	END NODE	DISTANCE
1	2	20
1	4	30
4	3	10
4	6	20
3	5	30
TOTAL LENGTH		110

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

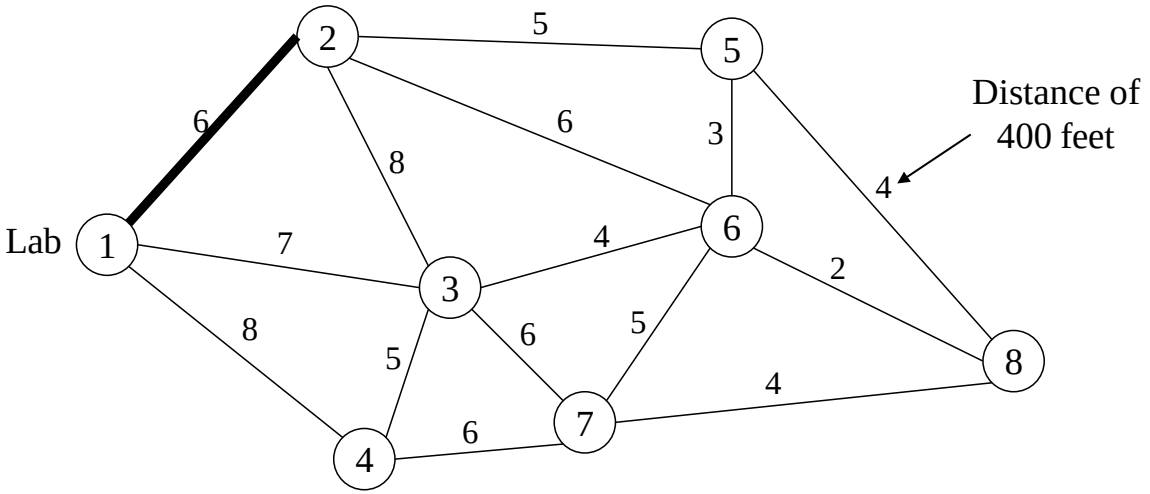
Problem Description

In a large soap products plant, quality control inspectors take samples of various products from the different production areas and deliver them to the lab for analysis. The inspection process is slow, and the inspectors spend substantial time transporting samples from the production areas to the lab. The company is considering installing a pneumatic tube conveyor system that could transport the samples between the production areas and the lab. The network below shows the locations of the lab and the production areas (nodes) where the samples must be collected. The arcs are the alternatives being considered for the conveyor system. What is the minimum total length and layout of the conveyor system that will enable all production areas to send samples to the lab?

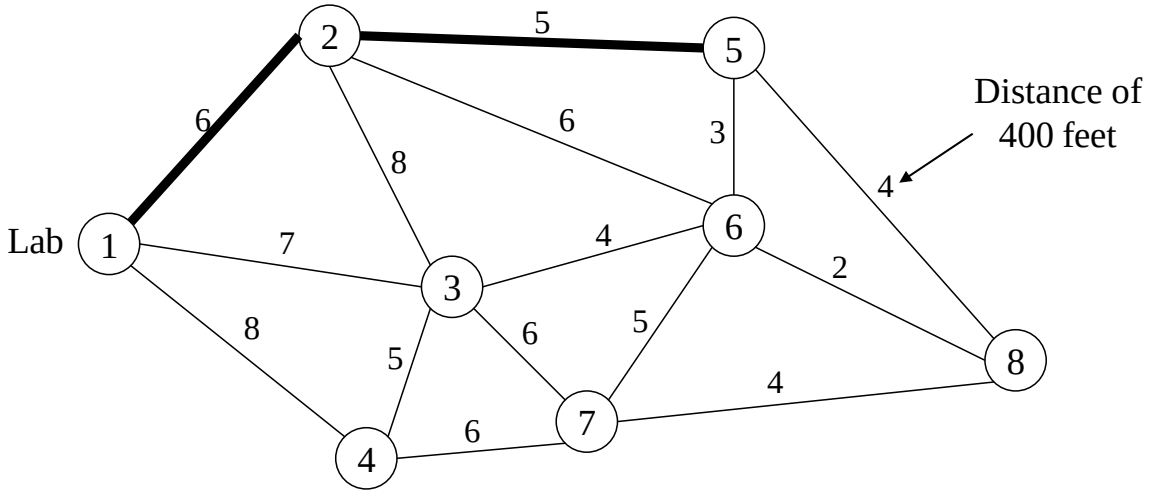


62

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

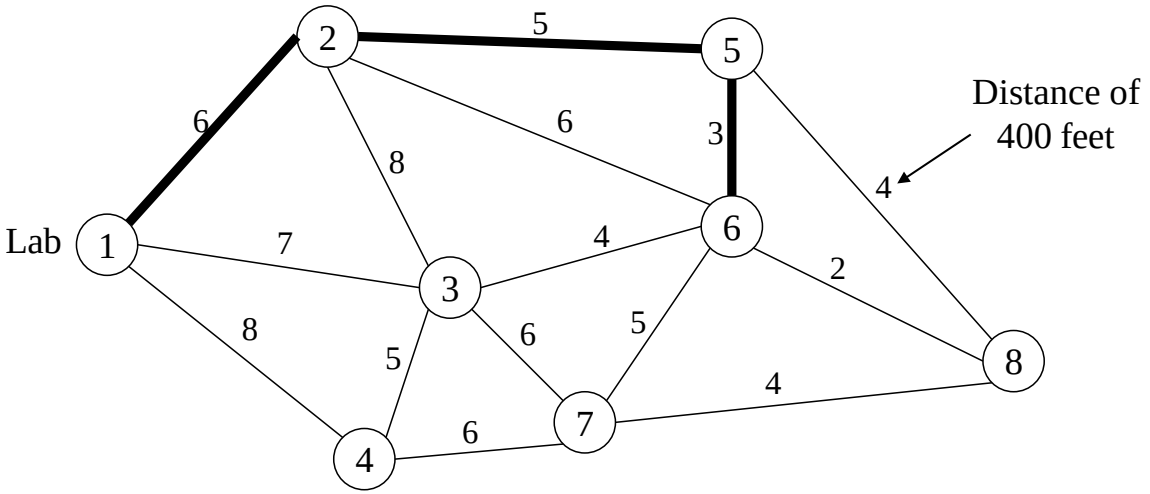


ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

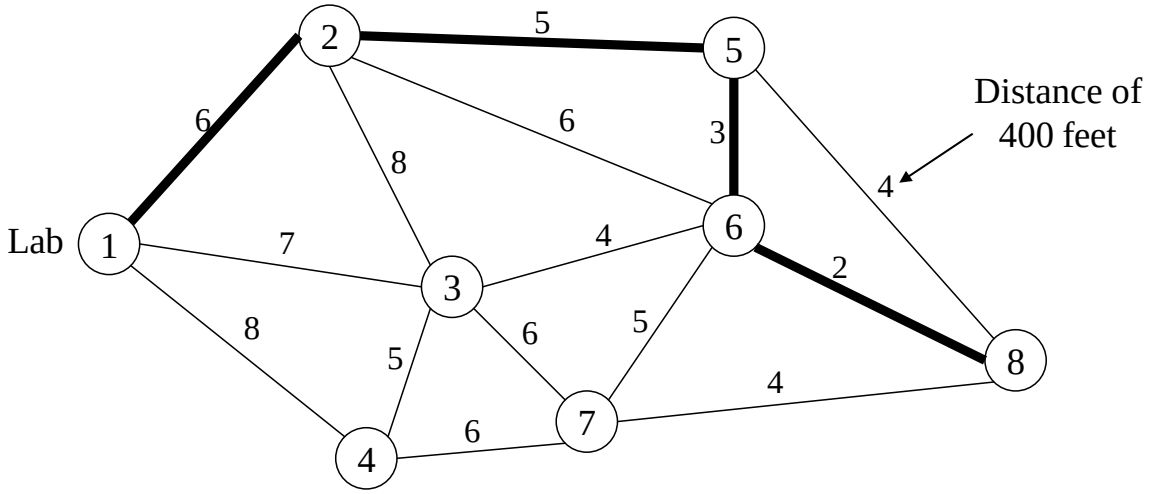


64

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

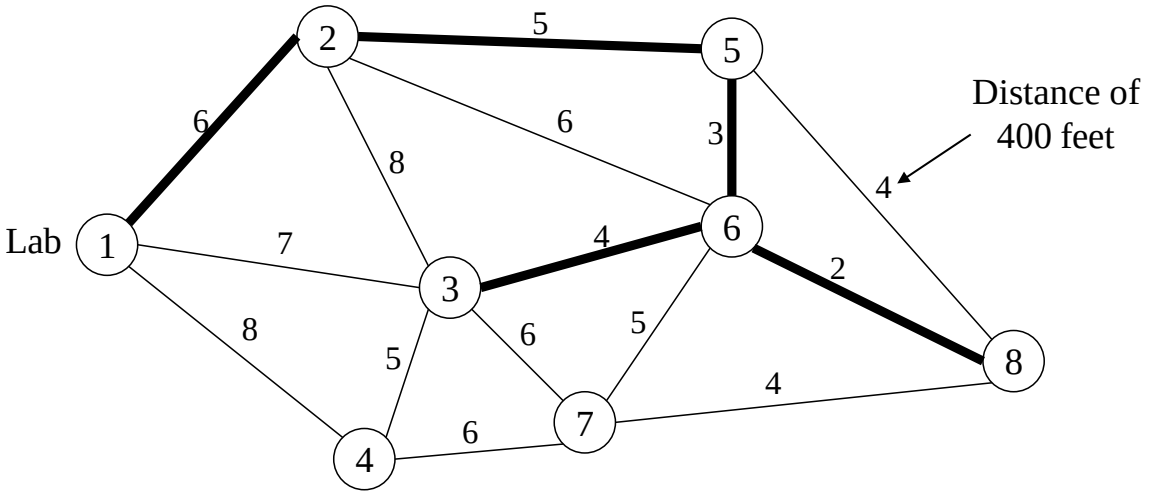


ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

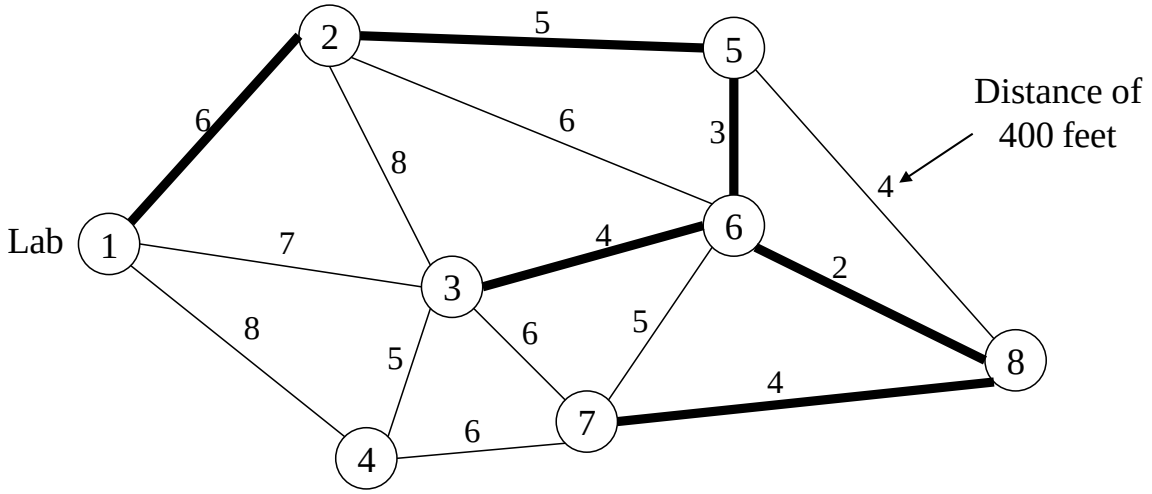


66

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

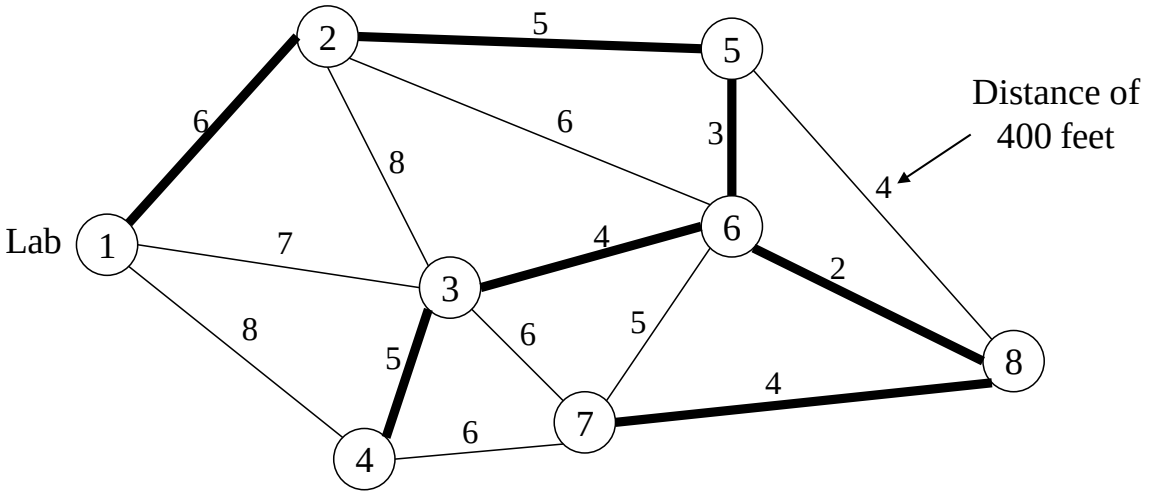


ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM



68

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

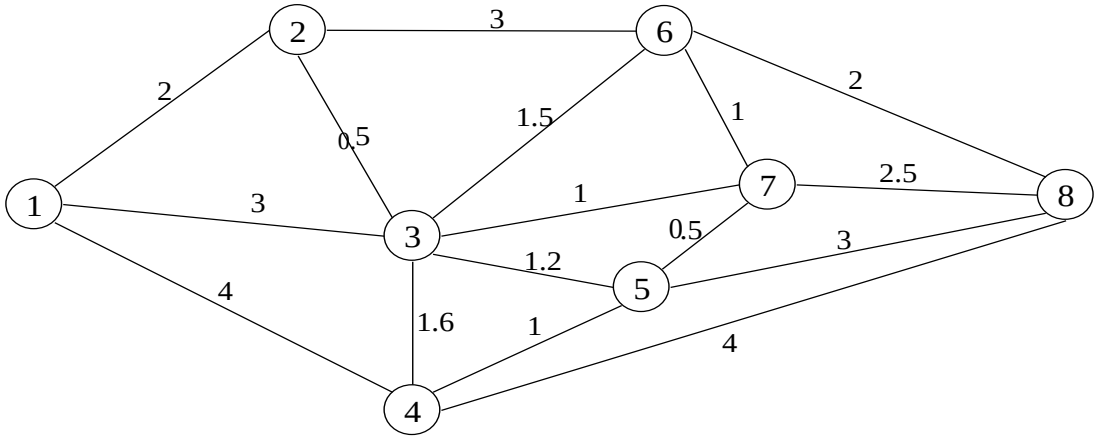


Κόστος / Cost = 6 + 5 + 3 + 2 + 4 + 4 + 5 = 29

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

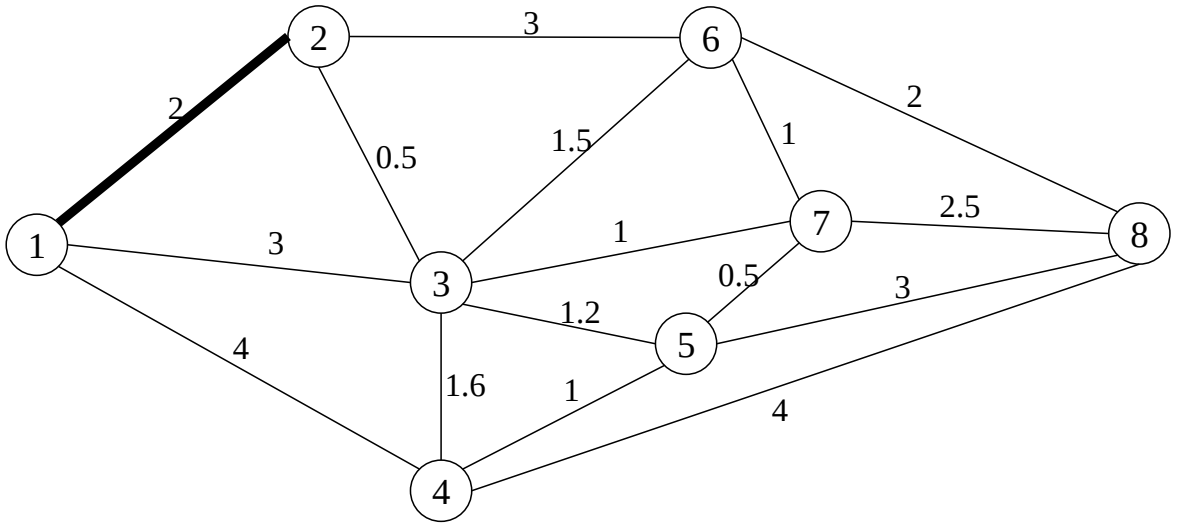
Problem Description

Midwest University is installing a computerized electronic mail system that will enable messages to be transmitted instantly among eight college offices. The network with possible electronic connections among the offices is shown below. Distances between offices are shown in thousands of feet. Develop a design for the office communication system that will enable all offices to have access to the electronic mail service. Provide the design that minimizes the total length of connections among the eight offices.

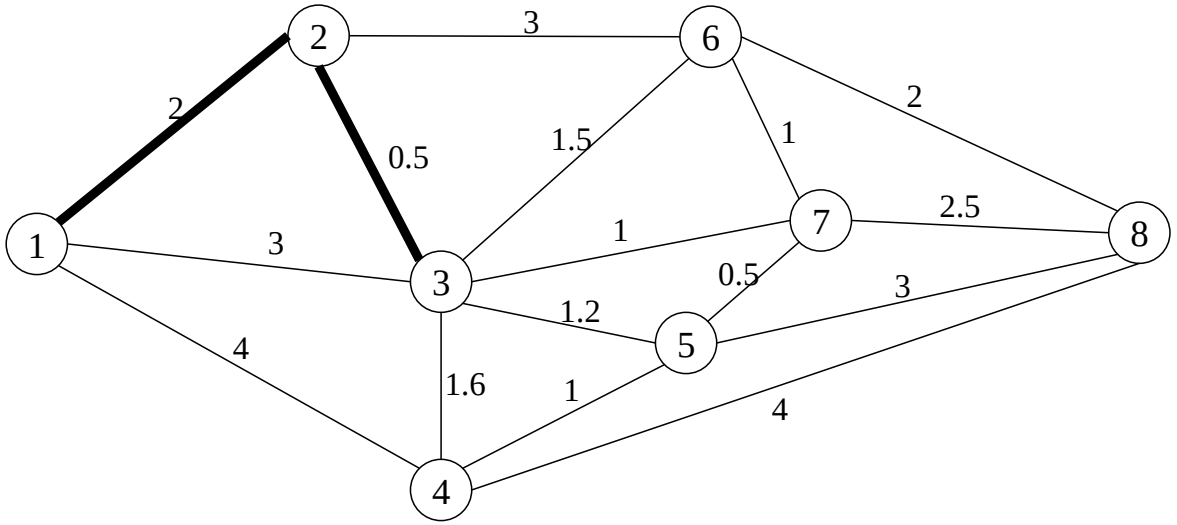


70

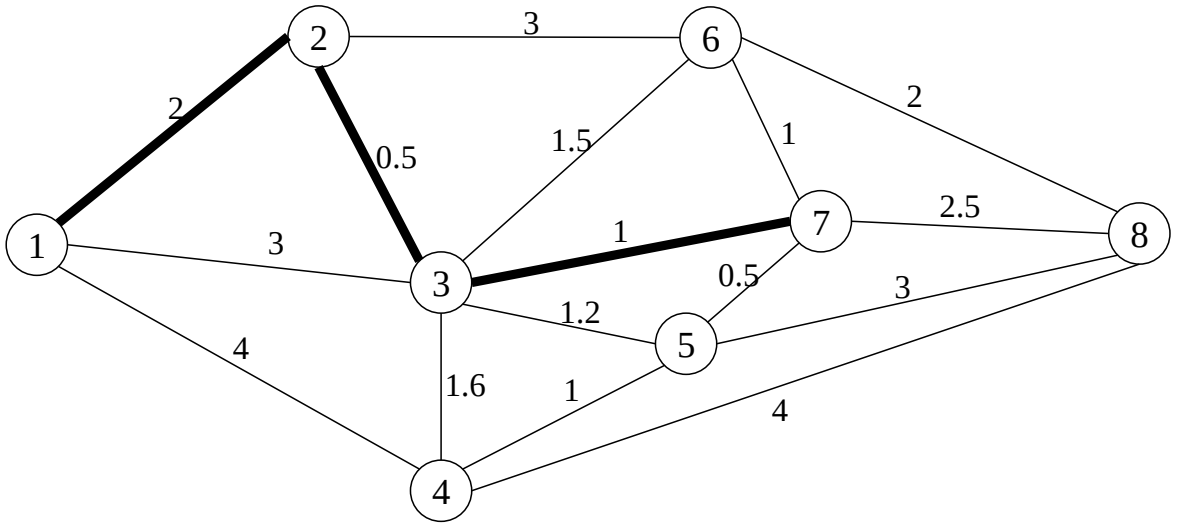
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM



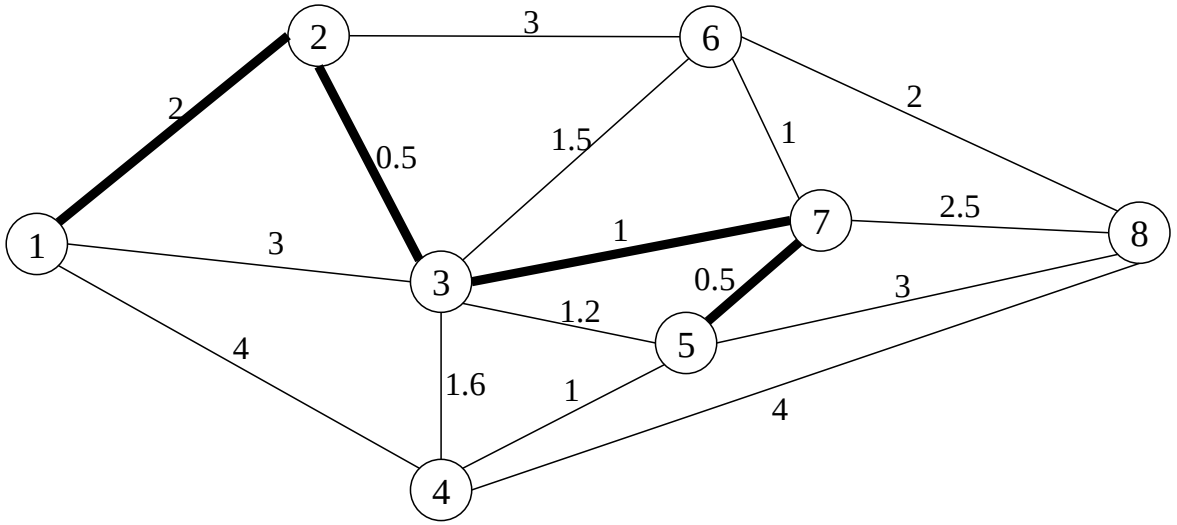
ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM



ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

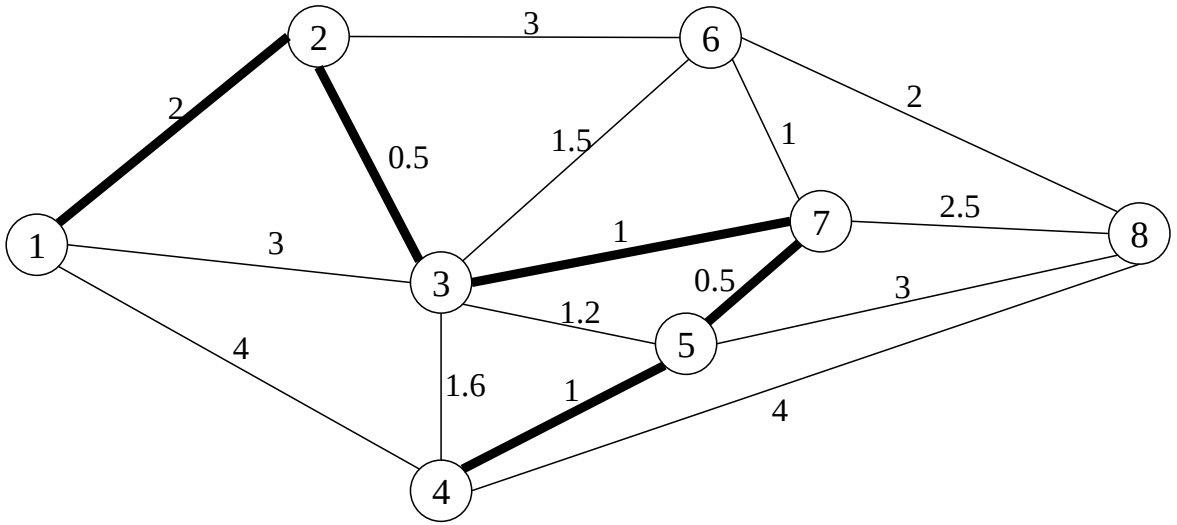


ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

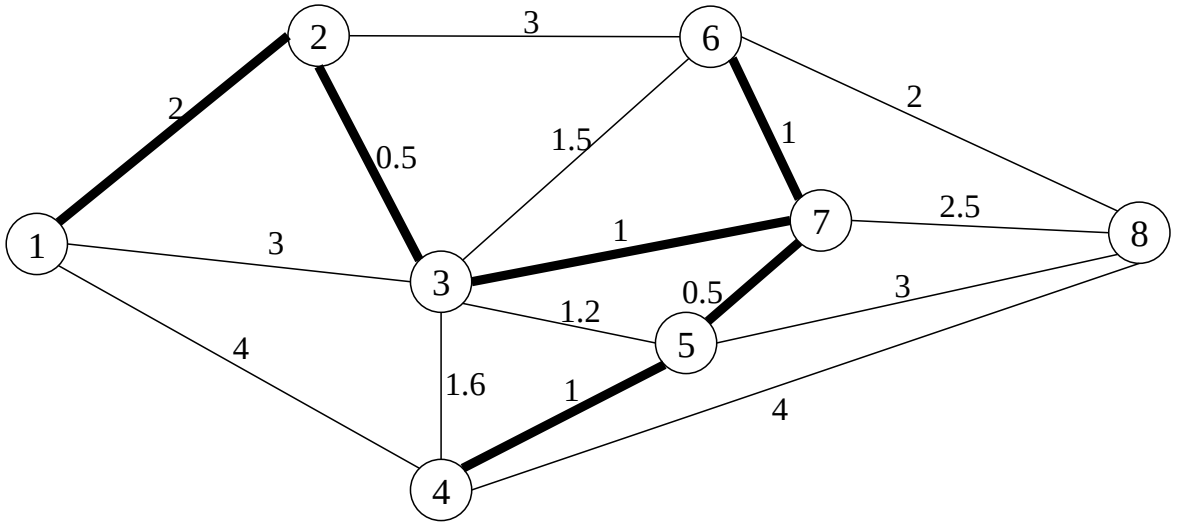


74

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM

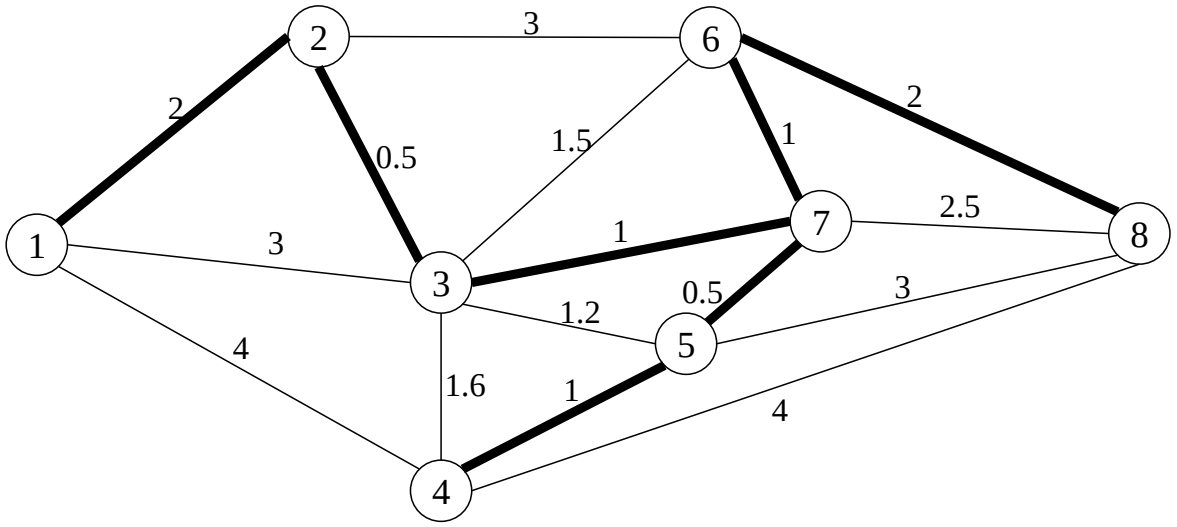


ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM



76

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM



Κόστος / Cost = 2 + 0.5 + 1 + 0.5 + 1 + 1 + 2 = 8

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
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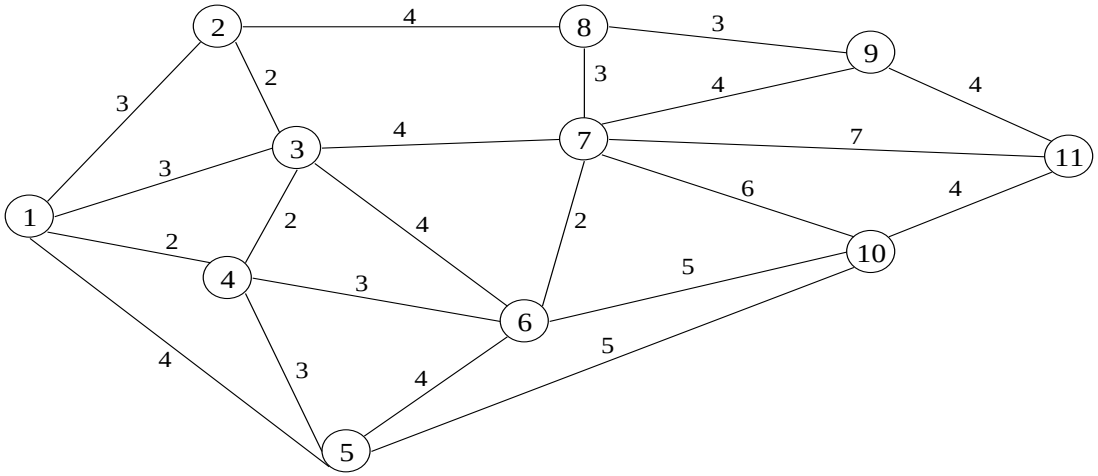
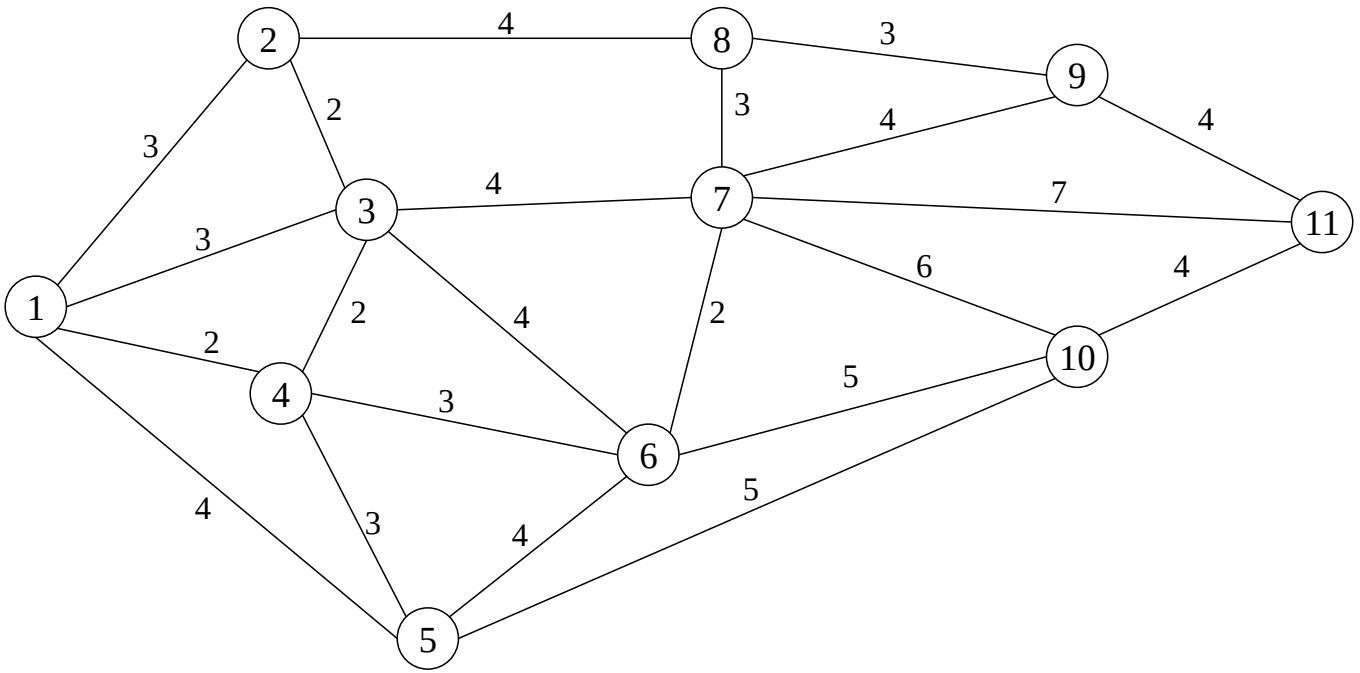
Problem Description

The Metrovision Cable Company has just received approval to begin providing cable television service to a suburb of Memphis, Tenn. The nodes of the network below show the distribution points that must be reached by the company's primary cable lines. The arcs of the network show the number of miles between the distribution points. Determine the solution that will enable the company to reach all distribution points with the minimum length of primary cable line.



78

ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
MINIMAL SPANNING TREE PROBLEM



ΠΡΟΒΛΗΜΑ ΕΛΑΧΙΣΤΟΥ ΖΕΥΓΝΥΟΝΤΟΣ ΔΕΝΡΟΥ
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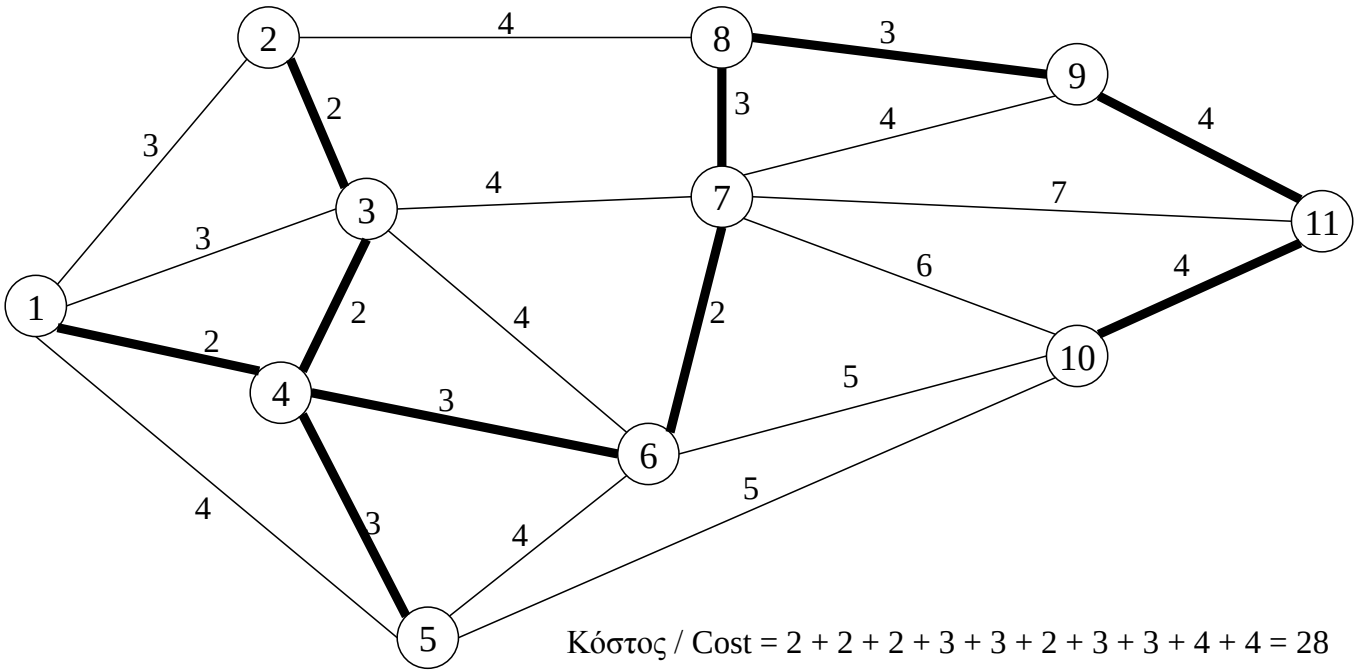

80