

Network Design [Network Optimization Module]

Exam 19/6/2017

Surname _____
Name _____

Exercise #1

The graph **graph19062017.gml** in the attached file contains a set of potential customers that a telecom company can connect with a network rooted in node 1. Each location (node) u has associated a profit [**profit** attribute in the graph] and each edge uv has a connection cost [**cost** attribute in the graph]. The company has a three years investment plan with the following budget:

Year 1: 12000 Euro

Year 2: 2000 Euro

Year 3: 600 Euro

Compare the following deployment strategies:

1. The company implements the network in the first year by paying 500 Euro of interest on the budget anticipation.
2. The company deploys the network in three years respecting the budget constraint for each year.

Exercise #2

The graph **atsp19062017.gml** represents a logistic distribution network. Each arc has a cost [**dist** attribute in the graph]. The company owns a vehicle located in node 1 and must deliver to any other node of the graph. However, goods are not stored in node 1 and the company must also decide in which node locate a warehouse among nodes {2,15,20}.

1. Find the most profitable location of the warehouse and the optimal delivering tour.
2. Find the costs increase if the company decides to use all three locations to store goods and to use 3 vehicles that travel up to 10 nodes each.