A green logistic service provider needs to buy a new fleet of electric vehicles to set up a transportation network to ship a given number of parcels from some origin depots (depot 1, depot 2 and depot 3) to some destinations (destinations 4, 5, 6, 7 and 8). The manager needs to decide what kinds of vehicles to buy to create the new fleet. Specifically, it has to decide among three different types, namely scooter, electric bike, and electric motorbike. A scooter costs 1000€ and may transport at most 4 parcels, an electric bike costs 1200€ and may transport at most 6 parcels, an electric motorbike costs 1700€ and may transport at most 9 parcels. The policy of the company is to buy only vehicles of one type to create the new fleet. However, there are no restrictions on the number of vehicles of the chosen type that can be bought by the company. Unfortunately, electric vehicles have a limited autonomy and a vehicle, no matter of the type, has enough charge to travel along one single link (e.g., moving from depot 2 to destination 7 and then from destination 7 to destination 8 is not possible for any vehicle type). The tables below report the available links for the transportation and the supply (with "+" in the table) and the demand (with "-" in the table) of parcels.

Node	Supply (+) and demand (-)
Depot 1	+38
Depot 2	+45
Depot 3	+28
Destination 4	-17
Destination 5	-16
Destination 6	-18
Destination 7	-26
Destination 8	-34

Available links
(1,4)
(1,5)
(1,3)
(2,3)
(2,7)
(3,5)
(3,6)
(3,8)
(7,8)

1. Formulate an Integer Linear Programming (ILP) model to decide what type of vehicles and how many vehicles the manager should buy to minimize the cost of purchase, by satisfying the demand of parcel transportation;
2. Implement the model via the modeling language AMPL and solve it by means of the optimization solver CPLEX;
3. How does the solution change if, for congestion reasons, at most 4 vehicles may move on each link of the network?