Consider the following scenario:

- there are $n$ customers and $m$ candidate facility locations;
- the distance of customer $i$ to a facility at location $j$ is $d_{ij}$;
- if we put a facility at location $j$, then at most $u_j$ and at least $l_j$ customers are to be assigned to it;
- we can locate at most $p$ facilities;
- every customer must be assigned to exactly one facility.

1. Formulate an MIP for facility location and customer assignment that minimizes the sum of the distances of each customer to his or her assigned facility. Run it with the given data. Hint: the optimal solution value is 71.

2. Modify the above formulation so as to minimize the difference between the maximum and minimum distances of customers to their assigned facility. Hint: the optimal solution value is 6.