# P3

# Q1.)

**Mathematical optimization model**

Let there be a set N = {1,2,…,20}

Flow[20][20] where Flow[i][j] is the flow from departments i and j

Distance[20[20] where distance[i][j] is the distance between spots i and spots j on the grid

Min{

**Code Model**

Let's denote map = [4][5] ---> (4 rows 5 columns) where each memory space contains the integer of the department number [ i ] [ j ]

department position number = i \* 5 + j

distance = [20][20] which takes this information from the csv file. [ i ][ j ]. where i denotes the start position and j denotes the destination position. It is a 20 by 20 matrix that maps the distance costs from spot 1 on the table in the question provided, to the spot 2 on the table that is provided in the question.

flow = [20][20] which takes this information from the csv file. [ i ][ j ]. where i defines the starting department number, and j defines the destination department number.

We must optimize min(c) = (product of sums of all costs and distances from one department to all other departments, repeated for each department)