Assignment 5- Srijan Yenamula , Adithya Job

**Question -5.1**

**Formulation of Indexes**

i ∈ I ={ 1..16} = Collection of distribution centers.

j ∈ J = { 1…4879}= Collection of Stores

Yij= The decision to send the pizzas across the distribution center to stores

Si = Supply of the Pizzas from Distribution Center [i] to Stores[j]

Dj = Demand of pizzas in each store

Ci = Cost of Sending a van from distribution center to stores

Mij = Miles to travel from Distribution Center [i] to Stores[j]

**Define and develop the data sets you will need to solve this problem**

**Stores Table:**  This table consist of Store Numbers and their Lat/ Long Data

**Distribution Centers Table:** This table consists of the Distribution Center’s Serial Number, Cost, LAt/Long, Supply Capacity of the same.

**Avg. Stores Demand Table:** This table consists of the Store Number and their average Demand

**Demand Table:** this table consists of the daily demand of the stores

**Miles Table:** This table consists of the distance between distribution center and the stores.

**Objective function**

16 4879

Min ( Σ Σ Yij \* Dj \* Ci \* Mij) / 9900.0 i ∈ I j ∈ J

i=1 j=1

**Constraints**

s,t 4879

1. Σ Yij\* Dj ≤ (4/7) Si ; Ɐ i ∈ I

j ∈ J

4879

2. Σ Yij =1 Ɐ i ∈ I , Yij = {1,0} ; Ɐ j ∈ J, i ∈ I

j ∈ I

**Question 5.2**

**Formulation of Indexes**

m ∈ mills = Number of mills {1 to38}

d ∈ dc= Number of distribution centers {1 to 16}

Mil = distance from mill ‘m’ to distribution center ‘d’ in miles

Sup[m]=supply of four days in fifty lbs sacks of flour at mill ‘m’

Dem[d]=demand of four days at distribution center ‘d’ in Fifty lbs sacks

Ct[m]=Cost per mile for each mill ‘m’

Cm[m]= Cost to make a sack of flour at mill ‘m’

Fc[m]= Cost for tooling mill ‘m’

edge[m,d]=Decision of mill ‘m’ is providing flour to distribution center ‘d’, 1- Yes, 0-No

tool[m]=Decision of mill ‘m’ is selected to provide flour to distribution centers. 1 –Yes, 0-No

**Datasets**

Supplier Data – provided the mill information, Lat and Long , capacity,cost/unit, fixed cost and cost/mile

Supplier and Distribution Center Distance – This table provides the distance between mill and Distribution center in miles

Flour Demand : this table holds how much each Distribution Center requires flour based on their pizza demand.

**Objective function:**

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