Operation Research: Mini Project

Transportation Problem:

If there are more than one centres, called origins from where goods need to be shipped to more than one places called “destinations” and the cost of shipping from each ofthe origins to each of the destinations being different andknown, the problem is to ships the goods from various origins to different destinations in a such manner that thecost of shipping or transportation is minimum.

The transportation problem is to transport various amounts of single homogenous commodity, that are initially stored atvarious origins to different destinations in such a way thatthe total transportation cost is minimum.

There are 3 method’s in transportation problem:

1. Least Cost Cell Method
2. Northwest Corner Method
3. Vogel’s Approximation Method

Solving the below problem using transportation method.

The DREAM - DRINK Company has to work out a minimum cost transportation schedule to distribute crates of drinks from three of its factories X, Y, and Z to its three warehouses A, B, and C. The required particulars are given below. Find the least cost transportation schedule.

From/To	A	B	C	Crates Avaiable
X	75	50	50	1040
Y	50	25	75	975
Z	25	125	25	715
Crates required.	1300	910	520	2730

1. Solve using Least Cost Method.

Q1 The DREM-DRINK company has to work out a minimum cost transportation schedule to distribute crates of drinks from three of its factories X, Y & Z to its ware houses A, B & C.

From/To	A	B	C	Supply Crates
X	75	50	50	1040
Y	50	25	75	975
Z	25	125	25	715
Crates Required Demand	1300	910	520	2730

Solving using Least cost cell method.

	A	B	C	Supply
X	75	50	50	1040
Y	50	25	75	975
Z	25	125	25	715
Demand	1300	910	520	2730

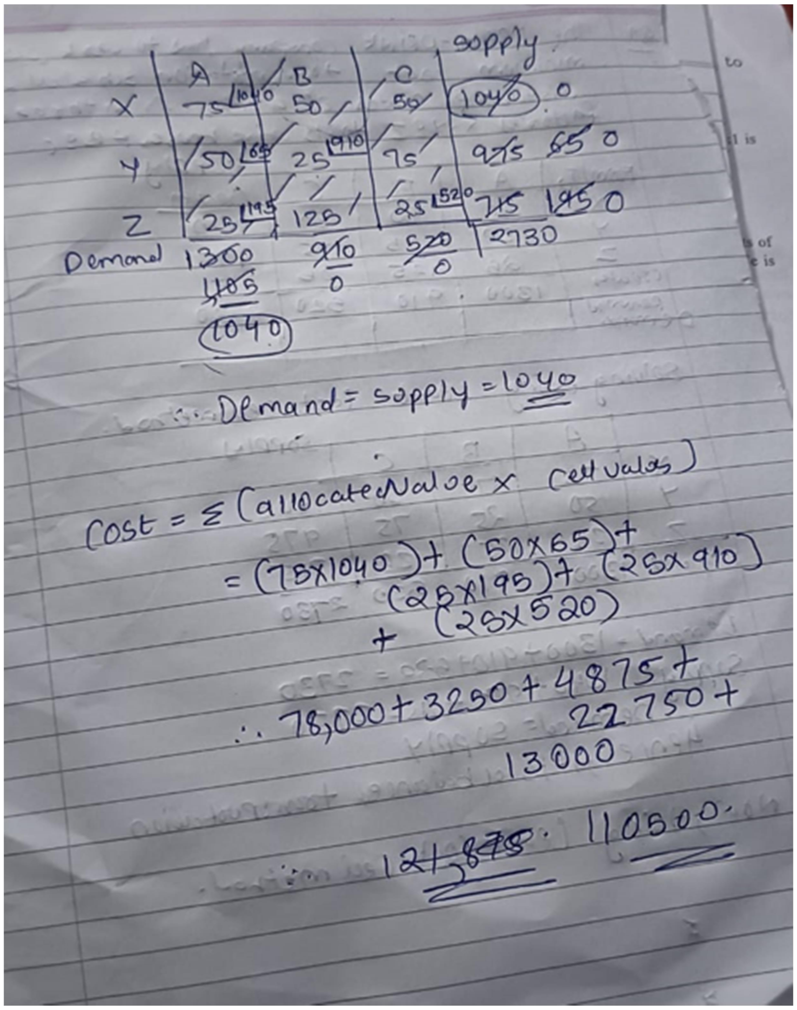
Demand = 1300 + 910 + 520 = 2730

Supply = 1040 + 975 + 715 = 2730

∴ Demand = Supply

Hence, it is a balanced transportation

Now, using Least cost cell method.



Implementation of above problem in R language.

Code:

```
library(lpSolve)

costs <- matrix(c(75,50,50,
                  75,25,75,
                  25,125,25), nrow = 3, byrow = TRUE)

colnames(costs) <- c("A","B","C")
rownames(costs) <- c("X","Y","Z")
```

```
row.signs <- rep("<=",3)
row.rhs <- c(1040, 975, 715)

col.signs <- rep(">=",3)
col.rhs <- c(1300, 910, 520)

TotalCost <- lp.transport(costs,"min",row.signs,row.rhs,col.signs,col.rhs)

lp.transport(costs,"min",row.signs,row.rhs,col.signs,col.rhs)$solution
print(TotalCost)
```

```
> lp.transport(costs,"min",row.signs,row.rhs,col.signs,col.rhs)$solution
     [,1] [,2] [,3]
[1,]  520    0  520
[2,]   65  910    0
[3,]  715    0    0
> print(TotalCost)
Success: the objective function is 110500
>
```