**Selection Strategy to maximize the profit for courier company profit**

**Objective:** Develop a selection strategy to utilize each “Load Carrier” to its minimum KM run during cycle and find the best available load carrier. So that the “Courier Company” maximize the profit.

**Language**: Python (Version 3.7.0)

**IDE**: Jupyter Notebook

**Introduction:**

Selection of Load carrier is very important decision in a courier company that concern with ensuring the right type (complete run cycle, maximize profit etc.). Right selection of load carrier can help company achieve marketing objectives.

In order to develop the selection strategy, a hypothetical data is created in which a courier company has 15 trucks Load Courier available and there are 5 varieties of Load Carrier which are V1, V2, V3, V4, and V5.

The hypothetical information regarding 15 trucks is created which contains the variable like, Type of vehicles, Rate of different varieties of vehicles, The start and end date of monthly cycle of each truck, Minimum Kilometres run guaranteed for each truck, Status of each truck such as whether it is in Vacant, Unloading or in Traveling position, The number of kilometres each truck has travelled so far.

The columns which is been derived from the given hypothetical data are:

1. *Left Distance:* The number of kilometres each truck is behind its minimum target.
2. *Assign Date:* The data of the assignment received by the courier company.
3. *Left Days:* The number of days left in the monthly cycle ahead of the data of the assignment.
4. *Passed Days:* The number of days in the monthly cycle before the data of the assignment.
5. *Average Efficiency:* The parameter to account whether the truck is efficient in completing its minimum run so far.
6. *Cost:* The cost which the company will bear if it assign the particular truck
7. *Minimum Cost:* the cost the company have to bear irrespective the status of the truck.

**Strategy used**: The strategy is developed in order to utilize each “Load Carrier” to its minimum KM run during cycle and find the best available load carrier which gives the maximum profit.

**Input**: Information regarding the date at which there is a request for the assignment and the distance between ‘a’ and ‘b’ is been asked by the user to input.

**Procedure:**

**Step 1:** *Sort the data on the basis of the monthly cycle.*

In first step we pick those trucks who are available during the given time period, because it will reduce the profit. So we can’t assign those trucks who has not available for the assignment during the assignment time.

**Step 2:** *Sort the on the basis of status:*

In this step, we sort the data on the basis of their loading status. We give the first preference of those trucks which are “Vacant” are waiting for the next assignment, and if there are no “Vacant” trucks are available in the given time period then the truck who are in unloading status is preferred. However the truck which one are travelling are less preferred (if there are no vacant and travelling are available).

**Step 3:** *Final sorting (Optimal Strategy)*

* If all the truck has not completed its minimum distance target after adding the assigned distance then we will assign the truck that has lowest days left to complete the cycle because its cycle is getting ended soon. So we have to utilize it.
* If there are multiple truck are under the same (above) condition and number of lest days are also same then we will choose those trucks who has lowest average efficiency because it will take longer to complete its monthly cycle. So we have to utilize it.
* If all the truck has exceeded its minimum distance target after adding the assigned distance then we will assign the truck that has minimum extra cost because it will reduce the company loss (minimize the profit). So we have to utilize it.
* The trucks which are either highly efficient i.e. Average efficiency of truck is greater than 1 or the distance assigned will exceed the minimum target, we ignore those trucks.
* If efficiency is high and the travelling distance is higher than its minimum distance (including new assignment) then we’ll ignore those truck.
* If efficiency is lower and the travelling distance is higher than its minimum distance (including new assignment) then we’ll ignore those truck.
* From the left truck we assigned the truck whose cost is minimum.

**Complexity:** There are still some complexity we can address in order to utilize each “Load Carrier” to its minimum KM run during cycle and find the best available load carrier, so that the “Courier Company” maximize the profit. I order to make the strategy, I write the code in more logical approach than mathematical formulation approach.

**Conclusion:** After getting the “Assignment date” and “Travel distance” from the user, as input. This model will give the “Assigned truck” or “Load Carrie” using optimal strategy, as output.