# Data Structures and Algorithms SP19 Project

# Phase II

# 1.Main Operations

**Load:**

# The Load Function takes a filename from the user, reads the Project info, and then it loops on events to fill the events queue. (Provided a LoadFileTemplate.txt).

**Printing:**

# The Printing function, for each Region, prints numbers of active orders of each type by looping upon the array of regions and using getters of the length of each list. It prints all assignments made at last time step by passing a string by reference to the Deliver function, the deliver function then adds a statement to that string for each assignment made.

**Event Execution:**

# The Event execution function, will loop upon the events queue loaded already from the input file and checks if the arrival time step of the front event has already come, it then calls the execute method depending on the event type;

# Arrival Event: creates a new order and puts it in the suitable list.

# Cancellation Event: searches the ID in all normal active orders list and deletes it if found.

# Promotion Event: searches the ID in all normal active orders list and moves it to VIP orders list in same region if found.

# Complaint Event: searches the ID in all VIP finished orders and moves it to Complaint Orders list in the same region if found.

**Auto Promotion:**

# This function will check upon the waiting time of normal active orders in all regions, if it is already greater than or equal to the auto promotion duration, it will explicitly execute a promotion event for this order.

**Deliver:**

# The Deliver Function will loop upon the lists of the active orders and check whether there are available motorcycles to deliver each of them. This sequence of checks is implemented according to the criteria mentioned in the document, it then sends the chosen motorcycle to the suitable In-Service list and send the order to the finished orders but waits for its actual finish time to label it as a finished order. Upon the delivery of an order with traffic problem the motorcycle used is labeled as needing rest , if it is already needing rest, it is labeled as damaged so it is returned to damaged lists upon return.

# Note that: upon any assignment made, all data members related are updated (returnTS,FinishTime,ServiceTime,…… etc).

**Complaint Orders Return:**

# The ReturnComplaintOrders Function will loop upon the lists of complaint orders in each region and check whether there are available motorcycles after delivery to return each of them, it is similar to Deliver function in next steps.

# Note that: a complaint order is returned by any available motorcycle.

**Return Motorcycles:**

# The Return Motorcycles function will loop upon all In-Service motorcycles lists and check whether there returnTS has already come, if so, it will move such motorcycle to the available lists unless it is damaged (bonus operation).

**Repairing Motorcyles:**

# If a motorcycle has already spent a certain repairing time (loaded from input file) in the damaged list, it should be now returned to its suitable available list.

**Save:**

# The Save Function, it uses all data members of counts previously updated and prepared to generate the ouput file with the name entered from the user and with format identical to that shown in the document.

# Note that: our save function is called only once at the end of the simulation and is not live updated.

# 2.Utility Methods

**Incrementing:**

# They are functions that are used to keep data members related to time updated at each timestep: (IncrementWaitTime,IncrementRepairTime,IncrementRestTime ……. Etc).