## Swiggy Delivery Challenge - Avoiding Rejects

Swiggy has a bold vision to elevate the quality of life of urban consumers by offering unparalleled convenience. At the heart of this vision is solving the hyperlocal delivery challenge of

***“ Assigning the right delivery partners to the right set of orders at the right time”***

This is one of those problems that is positioned at the cusp of marrying the state of the art methods in Artificial Intelligence and Operations Research in large-scale near-real-time applications.

Our delivery partners have the option to reject an order, if he/she wishes to. However, rejection of an order increases the delivery time for the customer, hence we want to avoid rejects.

Here are two sample datasets:

Assignment: Each row corresponds to an order assignment to the delivery partner.

|  |  |
| --- | --- |
| **Column name** | **Description** |
| ORDER\_ID | Unique Identifier for the ORDER |
| DE\_ID | Unique Identifier for the DE |
| ASSIGNMENT\_START\_TIME | Start Time of the Assignment |
| ASSIGNMENT\_END\_TIME | End Time of the Assignment |
| reject\_ind | Whether this assignment was rejected |
| reject\_type | Reject Type of this Assignment |
| PLACED\_TIME | Order Placed Time |
| DELIVERED\_TIME | Order Delivered Time |
| LASTMILE\_DISTANCE | Distance to travel in Last Mile (from Restaurant to Customer) |
| FIRSTMILE\_DISTANCE | Distance to travel in First Mile (from DE Assignment Location to Restaurant) |
| LAST\_MILE\_TIME\_PREDICTED | Time prediction for last mile |
| PAYOUT\_MADE\_TO\_DE | Actual payout made to DE for this order |
| NUM\_PING\_COUNT\_LAST10MIN | # of pings received from DE device in last 10 minutes |
| LAST\_PING\_TIME\_LAST10MIN | time of last ping received from DE device (within last 10 minutes) |
| CUSTOMER\_ZONE | Zone ID for the customer |
| CUSTOMER\_LAT | Coordinates of the customer |
| CUSTOMER\_LAT | Coordinates of the customer |

Delivery Partners: Each row corresponds to a delivery partner.

|  |  |
| --- | --- |
| **Column name** | **Description** |
| DE\_ID | Unique Identifier for the DE |
| SHIFT\_END\_TIME | Shift end time for DE (in HH:MM) |
| DE\_HOME\_LAT | Home Location coordinate for the DE |
| DE\_HOME\_LNG | Home Location coordinate for the DE |
| DE\_JOINING\_DATE | Joining date of the DE |
| DE\_ZONE\_ID | Zone ID for the DE |

These two datasets are attached in the email.

**Additional details:**

* Every 2 minutes, all the non-assigned orders are input to the assignment module. For each order, a set of DEs are evaluated, and the order is finally assigned one of these DEs.
* Delivery partners are allowed one reject per day, beyond which they are penalized.
* No payout is made to DE, if he rejects an order
* Every instance of a DE reject, is stored in the production tables, as a unique entry.

Delivering best customer experience is of supreme importance to Swiggy.

As a data scientist, solve the following challenges.

1. The first part of any data science problem is understanding the size, impact and cause of the problem (DE rejection in this case). With that context, can you do an exploratory data analysis?
2. Can you apply a machine learning algorithm on this dataset, to solve the problem? (Hint - The first run of model training might give you weird results)
3. Can you think about where and how the model should be used? Do you see any deployment challenges with the same? How do you overcome these challenges?

Requirements :

* Please submit a notebook of working code with results that you would be walking us through during the Technical depth round.
* You are free to use slides to present the results as well along with code walkthrough.