Problem Statement

At Zomato, our mission is to provide better food for more people. With that as our guiding light, we strive to deliver a great customer experience where quality food is delivered within the promised time.

Another important aspect of the environment that we operate in is to build a sustainable business model i.e. having a balanced cost structure.

One of the ways that we try to manage costs is by doing due diligence to batch orders such that it not only helps to reduce costs but also minimizes the effect on customer experience i.e. delay in food delivery.

The Task
Given the dataset, we want you to *determine the share of successfully delivered orders that can be batched for Bangalore*.

Batched orders are those that are picked together by a rider from the same restaurant so as to deliver more than 1 order in a trip.

For example, if orders 1,2,3,4,5 are delivered and out of them 1 and 2 got batched then the batching percentage is defined as ⅖ or 40%.

Also, order *breach* happens when the Actual delivery time is greater than the estimated delivery time by a delta, which is a configurable parameter.

Actual delivery time = Delivered_at - Created_at.
where, Delivered_at is the time when the order is delivered to the customer, either batched or not batched.

Constraints:

1. Each rider at any given time can carry a maximum of 2 orders and a new order can only be assigned when all the previously picked up orders have been delivered.
2. A rider travels at a constant speed of 15 Km/hr.
3. For computing distance, use aerial distance between two points.
4. *Only* consider orders that are fulfilled by Zomato
5. When Orders O1 and O2 are batched, then O1 has to be delivered first, if O1 was created before O2 and vice versa.

Evaluation Criteria

- The approach towards solving the problem
- Ability to convey your approach through documentation
- Actual solution of the problem (good to have)

Note: Please make sure to list out all your assumptions, used to solve this case, clearly.

Deliverable

- Python/R notebook, which shows all your work.

Data Description

The data is of one particular day and is at item level.

Field Name	Type	Description
food_order_id	Integer	Unique id of the order placed
food_restaurant_id	Integer	Unique id of the restaurant
pickup_latitude	Double	Latitude of the restaurant
pickup_longitude	Double	Longitude of the restaurant
city_name	String	City to which restaurant belongs
drop_latitude	Double	Latitude of user delivery location
drop_longitude	Double	Longitude of user delivery location
created_at	Timestamp	Time when the order was accepted by the merchant in the system
pickup_to_drop_location_km	Double (in km)	Road distance between the restaurant and user location.
expected_delivery_time	Double (in minutes)	Estimated delivery time of the order shown to the user.
predicted_food_prep_time	Double (in minutes)	Kitchen Preparation time of the order as predicted by the model.
driver_type	Integer	Whether the order was fulfilled by Zomato(value is 15) or third party.
order_status	Integer	Status of the order, 6 is successfully delivered, otherwise rejected.
item_name	String	Name of the item that was ordered
item_quantity	Integer	Number of items of a particular item that were ordered.
item_unit_cost	Double	Per unit cost of that item.