Cookr Hackathon

ALGORITHMIC APPETIZERS
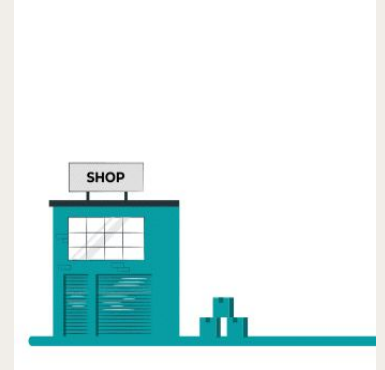
Problem Statement

01
Item Categorization

02
Last Mile Delivery Batching

Statement 1 - Item Categorization

Create a model or research the necessary steps to create a model for categorizing items. When the cook adds an item to their kitchen, it should be automatically categorized into multiple categories. We can provide the sample data for this to train the model.

For instance,

South Indian

Protein Rich

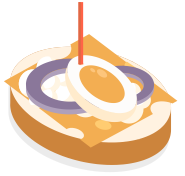Breakfast

Baked Items

North Indian

Protein Rich

Non-veg

Punjabi

Approach

★ Used a Dataset from Kaggle

★ Utilized MultiLabelBinarizer to convert dish categories into binary format.

★ Tokenized text data using the Tokenizer class.

★ Constructed a neural network model with LSTM layers for both ingredients and recipe names for each type of category

★ Implemented TF-IDF vectorization and cosine similarity to identify the top 5 dishes similar to a user-provided dish.

★ Potential future enhancements include integrating user feedback, expanding the dataset, and fine-tuning the model for continuous improvement.

Look at the Dataset

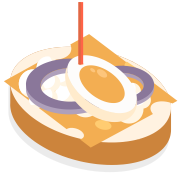|	A	B	C	D	E	F	G	H	I	J
1	Name	Ingredients	PrepTim	CookTi	TotalT	Servin	Cuisine	Course	Diet	Instructions
2	Masala Karela Recipe	6 Karela (Bitter G	15	30	45	6	Indian	Side Dish	Diabetic Friendly	To begin making the Â Masala Karela Recipe,de-seed the karela and slice. Do not remove the skin
3	Spicy Tomato Rice (Recipe)	2-1 / 2 cups rice -	5	10	15	3	South Indian Reci	Main Course	Vegetarian	To make tomato puliogere, first cut the tomatoes. Now put in a mixer grinder and puree it. Now
4	Ragi Semiya Upma Recipe - Ragi Millet Vermicel	1-1/2 cups Rice V	20	30	50	4	South Indian Reci	South Indian Bre	High Protein Vegetarian	To begin making the Ragi Vermicelli Recipe, first steam the ragi vermicelli in a rice cooker or a ste
5	Gongura Chicken Curry Recipe - Andhra Style Go	500 grams Chicke	15	30	45	4	Andhra	Lunch	Non Vegeterian	To begin making Â Gongura Chicken Curry Recipe first prep all the ingredients and keep them aside
6	Andhra Style Alam Pachadi Recipe - Adrak Chutr	1 tablespoon cha	10	20	30	4	Andhra	South Indian Bre	Vegetarian	To make Andhra Style Alam Pachadi, first heat oil in a pan. Add lentils and cook till it turns brown
7	Pudina Khara Pongal Recipe (Rice and Lentils Co	1 cup Rice - soak	10	20	30	4	South Indian Reci	South Indian Bre	High Protein Vegetarian	To begin making Â Pudina Khara Pongal Recipe, wash and soak the rice and dal for 20 minutes.Ma
8	Udupi Style Ash Gourd Coconut Curry Recipe	500 grams Vellai	10	30	40	4	Udupi	Lunch	Vegetarian	To begin making the Udupi Style Ash Gourd Coconut Curry Recipe Â cook the ash gourd in the pre
9	Mexican Style Black Bean Burrito Recipe	4 Tortillas,1/4 cup	10	30	40	4	Mexican	Lunch	Vegetarian	To begin making the Black Bean Burrito recipe, pick the coriander leaves and set aside, then finel
10	Spicy Crunchy Masala Idli Recipe	10 Idli - cut into s	10	20	30	3	South Indian Reci	Snack	Vegetarian	To prepare Spicy Crunchy Masala Idli Recipe, Heat a tablespoon of oil in a heavy bottomed pan a
11	Cauliflower Leaves Chutney (Recipe in Hindi)	1 cup cabbage lea	5	20	25	3	South Indian Reci	Side Dish	Vegetarian	To make cauliflower leaf chutney, first of all take out the leaf inside the cabbage and wash it wel
12	Homemade Baked Beans Recipe (Wholesome &	250 grams Dry be	60	60	120	4	Fusion	High Protein Veg	Vegetarian	To begin making the homemade baked beans recipe, we first have to soak the beans overnight fo
13	Veg Chili Cheese Burgers Recipe	2 Burger buns,5 P	10	45	55	4	Continental	Main Course	Vegetarian	To begin making the Veg Chili Cheese Burgers Recipe, we will first pressure cook the potatoes an
14	Andhra Steel Ingavu Charu Recipe - Asfoitida Fla	2 cup Tamarind W	0	30	30	4	Andhra	Lunch	Vegetarian	To begin making the Andhra Style Ingavu Chaaru Recipe pressure cook the tamarind water with t
15	And fish soup recipe - Bengali style fish in tomat	600 grams Aar Ma	5	15	20	2	Bengali Recipes	Dinner	High Protein Non Vegetaria	To begin making the Aar Macher Jhol Recipe, firstly marinate the fish with salt and turmeric powd
16	Saunf Aloo (Fennel Potato Curry) Recipe	5 Potatoes (Aloo)	10	15	25	6	Punjabi	Lunch	Vegetarian	To begin with Saunf Aloo, heat oil in a pressure cooker. Add turmeric powder, salt, red chilli powc
17	South Indian Onion Chutney Recipe - South Indi	2 onions, 1 teasp	20	20	40	4	South Indian Reci	Side Dish	Vegetarian	To make South Indian Onion Chutney, first of all chop the onion and keep it aside. Now heat 1 te
18	Hariyali Egg Curry Recipe In Coriander and Mint	4 Whole Eggs - bc	15	20	35	4	Indian	Lunch	Eggetarian	To begin making the Hariyali Egg Curry recipe, we will first make the Hariyali Masala.Into the Mix
19	Gourd Raita Recipe - Grated Bottle Gourd Yogu	2 cups curd, 1 cup	15	15	30	4	Indian	Side Dish	Vegetarian	To prepare gourd raita, prepare all the ingredients first. Add grated gourd, cucumber, curd, green
20	Homemade Tater Tots Recipe	10 Potatoes (Aloo	15	45	60	8	Continental	Appetizer	Vegetarian	To begin making the Homemade Tater Tots Recipe, scrub potatoes thoroughly and wash them ur
21	Chettinad Vegetable Casserole Recipe - Chettin	1 cup rice - wash	15	45	60	4	Chettinad	Dinner	Vegetarian	To make Chettinad vegetable casserole, first cut all the vegetables. Soak rice for 30 minutes. Hea
22	Garlic Amla Chutney Recipe - Lehsun Amla Chut	8 amla, 6 small or	5	10	15	3	Tamil Nadu	Side Dish	Vegetarian	To make Garlic Amla Chutney Recipe, first wash the amla, cut and remove the seeds. Now wash
23	Maharashtrian Kakdi Thalipeeth Recipe - Spiced	1/2 cup Gram flo	30	30	60	4	Maharashtrian Re	Indian Breakfast	Diabetic Friendly	To begin making the Maharashtrian Kakdi Thalipeeth Recipe, in a large mixing bowl add all the 3 f
24	Homemade Healthy Subway Sandwich Recipe V	2 Submarine Brea	15	15	30	4	Fusion	Dinner	High Protein Vegetarian	To begin making Subway Sandwich Recipe With Roasted Beetroot, we will first cook the beets.He
25	South Indian Style Murungakkai Porival Recipe -	5 Drumstick - cut	30	15	45	4	South Indian Reci	Side Dish	Vegetarian	To begin making Murungakkai Porival Recipe, wash the drumsticks well & peel them by removing

Statement 2 - Last Mile Delivery Batching

In today's fast-moving e-commerce landscape, efficient last-mile delivery is critical for both customer satisfaction and business success. Our focus is on optimizing both delivery speed and resource allocation to achieve cost reductions and a competitive advantage. We aim to deliver superior customer experiences while increasing profitability.

Approach towards the Problem

Assignment Delay: How long before we can find a Delivery Executive who can fulfill this order?

First Mile: How long before they arrive at the Restaurant?

Prep Time: How much time is required for the Restaurant to prepare the food?

Last Mile: How much time is required for the Delivery Executive to reach the customer from the Restaurant?

PREP TIME

LOOKING FOR DELIVERY EXECUTIVE

LAST MILE TIME

CUSTOMER LOCATION

FIRST MILE TIME

WAIT TIME
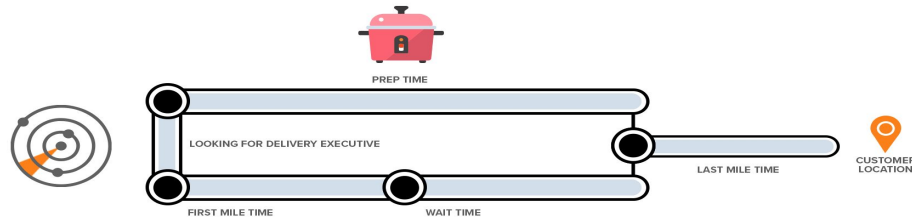
Delivery Time =
Max (Assignment Delay + First Mile Time, Prep Time) + Last Mile Time

TOO HIGH
VERY FEW PEOPLE
ORDERING

TOO LOW
BAD CUSTOMER
EXPERIENCE

PROMISED TIME

GOLDILOCKS VALUE

JUST RIGHT

Estimating Last Mile Time

★ Leveraging historical data
★ Enhancing historical data with real time signals

PREP TIME FACTORS

Type of item

Number of items

Load on restaurant

Estimating Preparation Time

Estimating Assignment Delay and First Mile Time

Tracking Delivery Executive status and estimating availability

Predicting customer demand to decide serviceability

Managing reservations and rejections

Using historical data to estimate average delay

Optimize delivery items

★ **Just In Time Assignment (JIT):** A way to minimize the time spent by the Delivery Executive at the restaurant waiting for the food to be prepared.

★ **Batching:** A way to increase the efficiency of Delivery Executives by delivering more than one order at a time.

Just In Time Assignment

As soon as an order is placed, two wheels are set into motion:
- ★   On one side, the restaurant starts preparing an order
- ★   On the other side, the system searches for nearby **delivery executives** and assigns them so they can head to the restaurant and pick up the order.
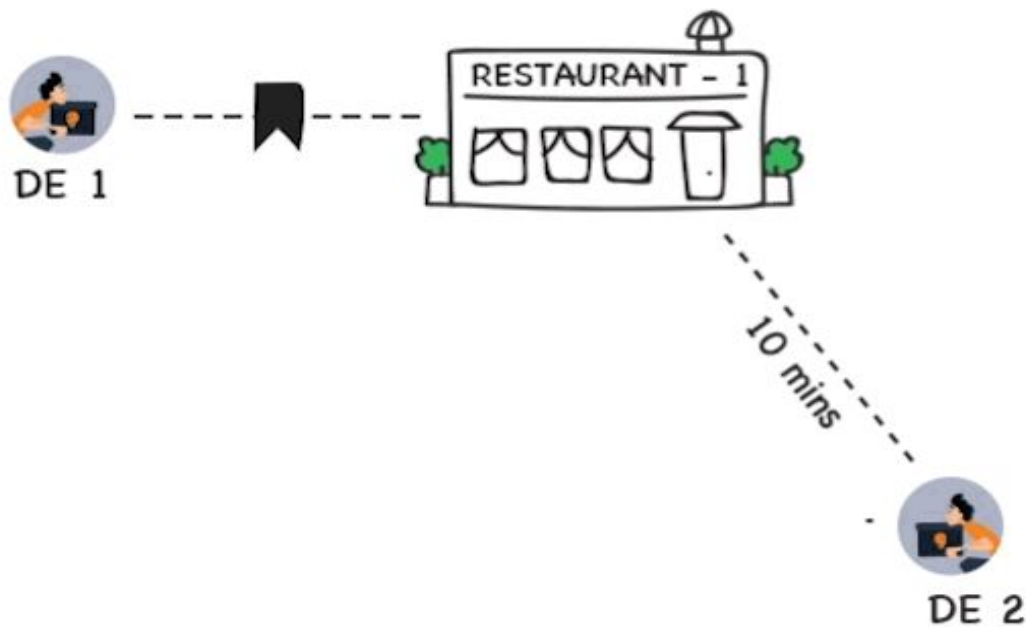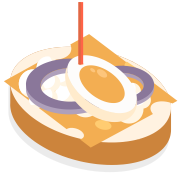
PLACE ORDER

RESTAURANT - 1

DE 1 — 5 mins — RESTAURANT - 1

10 mins — DE 2
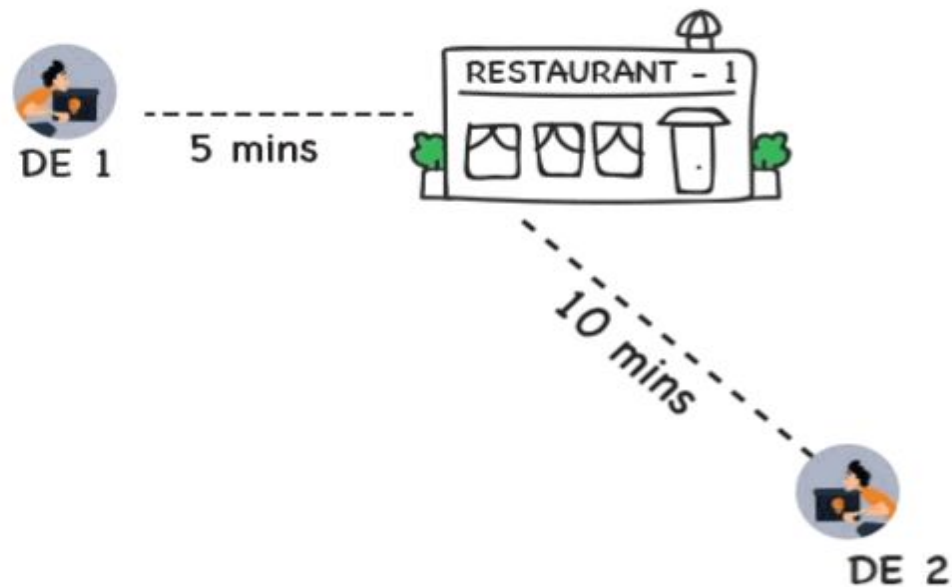
Total time taken : 25mins.

No JIT - Immediate Assignment

RESTAURANT - 1

DE 1

10 mins

DE 2

Total time taken : 15mins

JIT Assignment with swaping

Challenges Faced using JIT

1. What if we overestimate the preparation time required by the restaurant?

   The dispatch gets delayed for a longer time than required which leads to degraded food quality because the order is simply sitting out, waiting to be picked up.
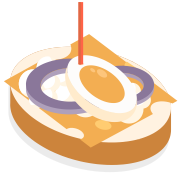
2. What if we underestimate the time required for the executive to reach the restaurant?

   Again, the order might get delayed and food quality will suffer. This scenario will happen more often if the delivery executive is moving.
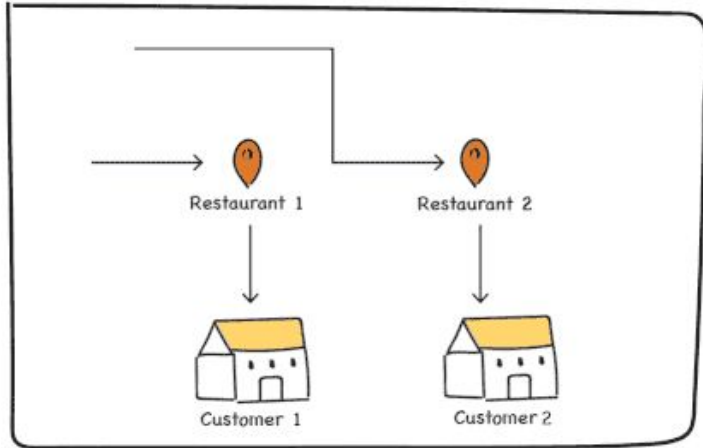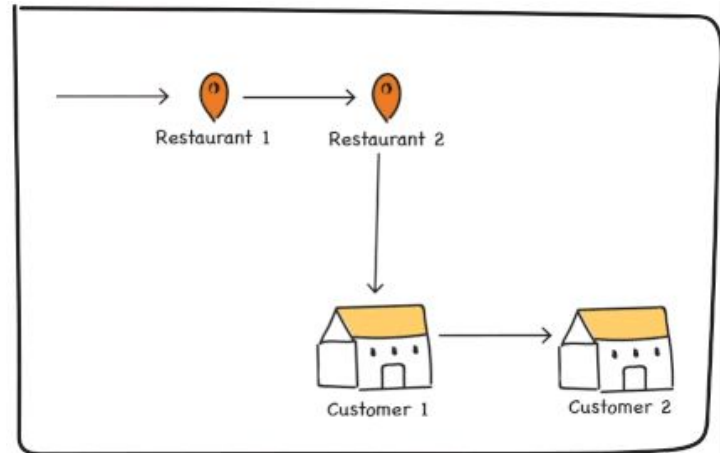
Batching

Batching is a simple concept — if a restaurant gets two orders at the same time from two customers located nearby, it makes perfect sense to dispatch a single Delivery Executive to deliver both orders.

This helps us to significantly increase the number of orders we can deliver with a fixed set of executives.

2 Delivery Executive - without Batching
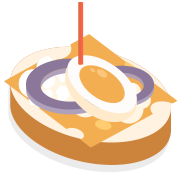

1 Delivery Executive - with Batching

Batchability relies on a few factors: **concurrent orders** and **proximity of the customers**.

Basically it's those orders that are placed within minutes of each other by customer who are,

★ Located close to each other

★ To the same or nearby restaurants

Implementation Details

★ Python 3.12 - Numpy, Pandas, SKLearn, Tensorflow, Streamlit
★ IDE - Google Colab, VS Code
★ Version Control System - Git

★ Dataset - 6000+ Indian Food Recipes Dataset | Kaggle

Challenges Faced

★ Training Data
★ Designing of problem

Thank You