CGAS MINI-PROJECT

Indian Cuisine Analysis & Prediction

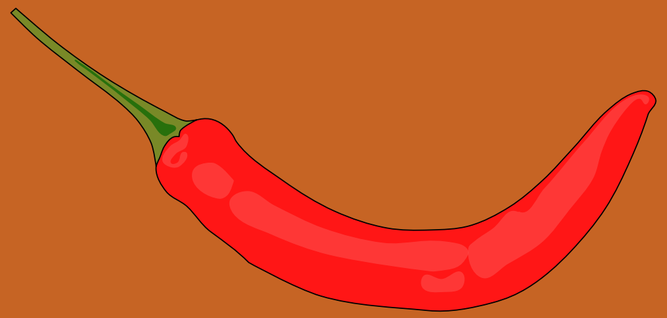
Amisha Aggarwal (2019016) *Kesar Shrivastava (2019051)* *Yash Tanwar (2019130)*

Why this project?

"If cuisines were people, French food would be a goody-two-shoes know it all, always the first to have their hand up in class, and Indian food would be the rebel at the back of the class in a leather jacket who everyone is intimidated by but secretly wants to be friends with. That's because Indian food breaks all the rules of cooking."

What distinguishes it from most Western cuisines? - While most western meals are based on the same concept and follow similar trends - Flavor Pairing. Chefs in the West prefer to use ingredients that have overlapping flavours.
So, what distinguishes Indian cuisine? - Most Asian cuisines prefer meals with distinct flavour profiles, and Indian cuisine, in particular, is a fantastic illustration of this trend.

This project aims to analyse the various trends within the Indian cuisine and what makes it so unique. The objective is to bring forth interesting observations. We have also trained ML models to predict the flavours and regions of the dishes



Indian Cuisine

India's cuisine is one of the most diversified globally, distinguished by its nuanced and subtle use of the various spices, vegetables, cereals, and fruits found throughout the country.

The different demographics of the ethnically diverse Indian subcontinent are reflected in the cuisine of each geographical location, which encompasses a vast variety of foods and cooking styles.

Dataset Description

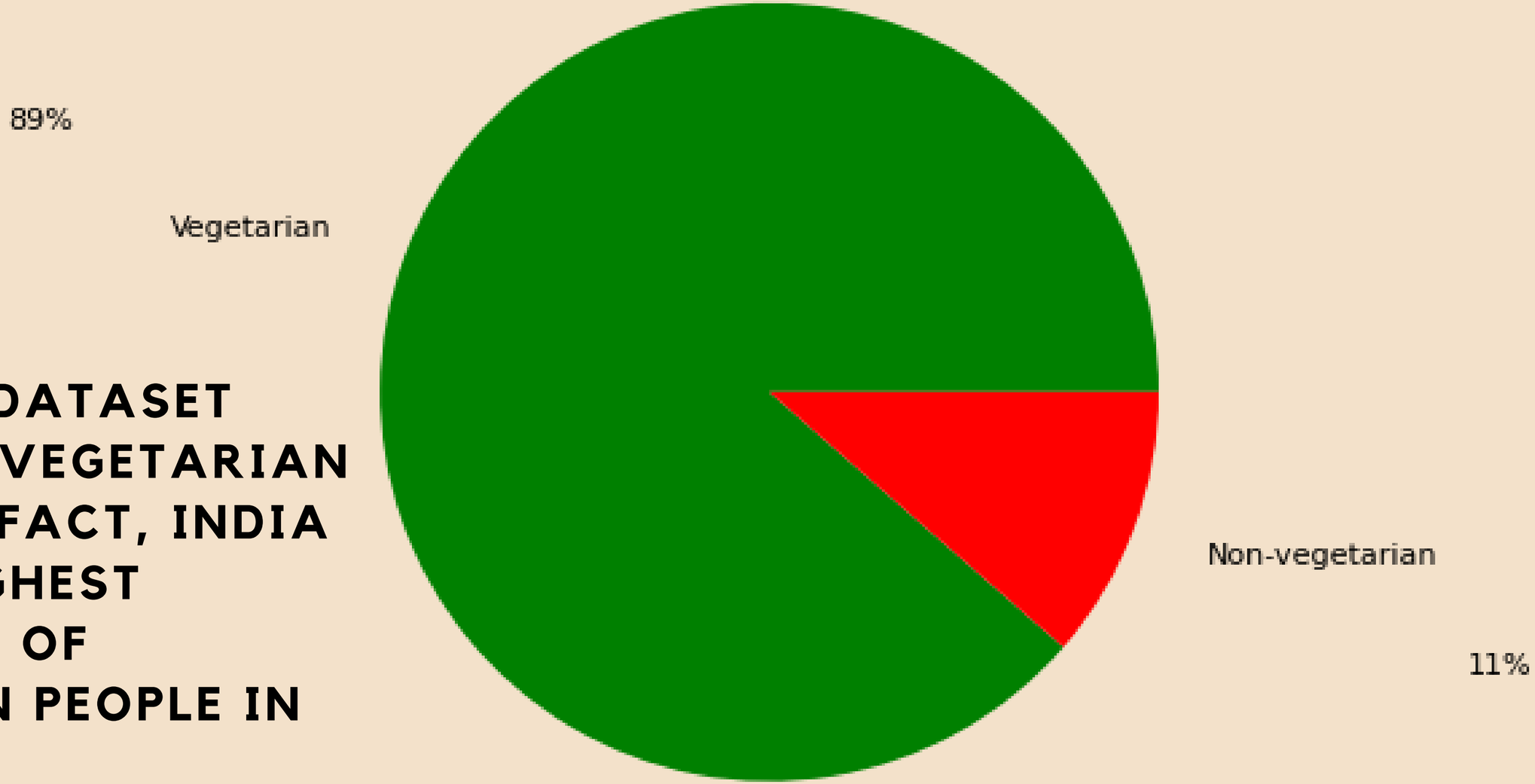
Each row of the dataset contains the following columns:

- name: Name of the dish
- ingredients: main ingredients used
- diet: type of diet - either vegetarian or nonvegetarian
- prep_time : preparation time
- cook_time: cooking time
- flavor_profile: describes the flavor of the dish as spicy, sweet, bitter, etc.
- course: course of the meal - starter, main course, dessert, etc
- state: the state where the dish is famous or is originated
- region: the region where the state belongs

Prep Time

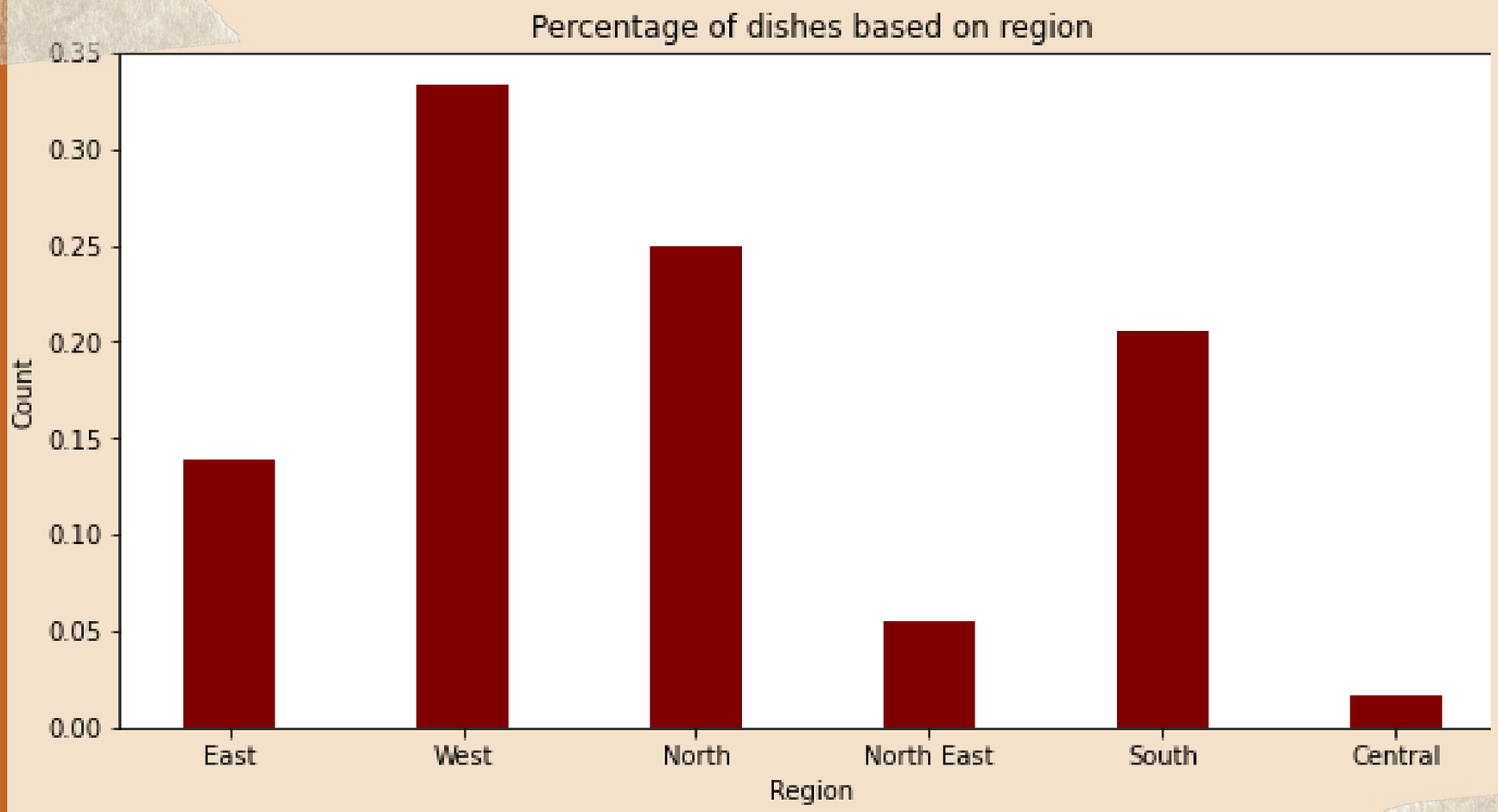
Imarti	Sugar syrup, lentil flour	vegetarian	10	50	sweet	dessert	West Bengal	East

Proportion of Veg vs Non-veg

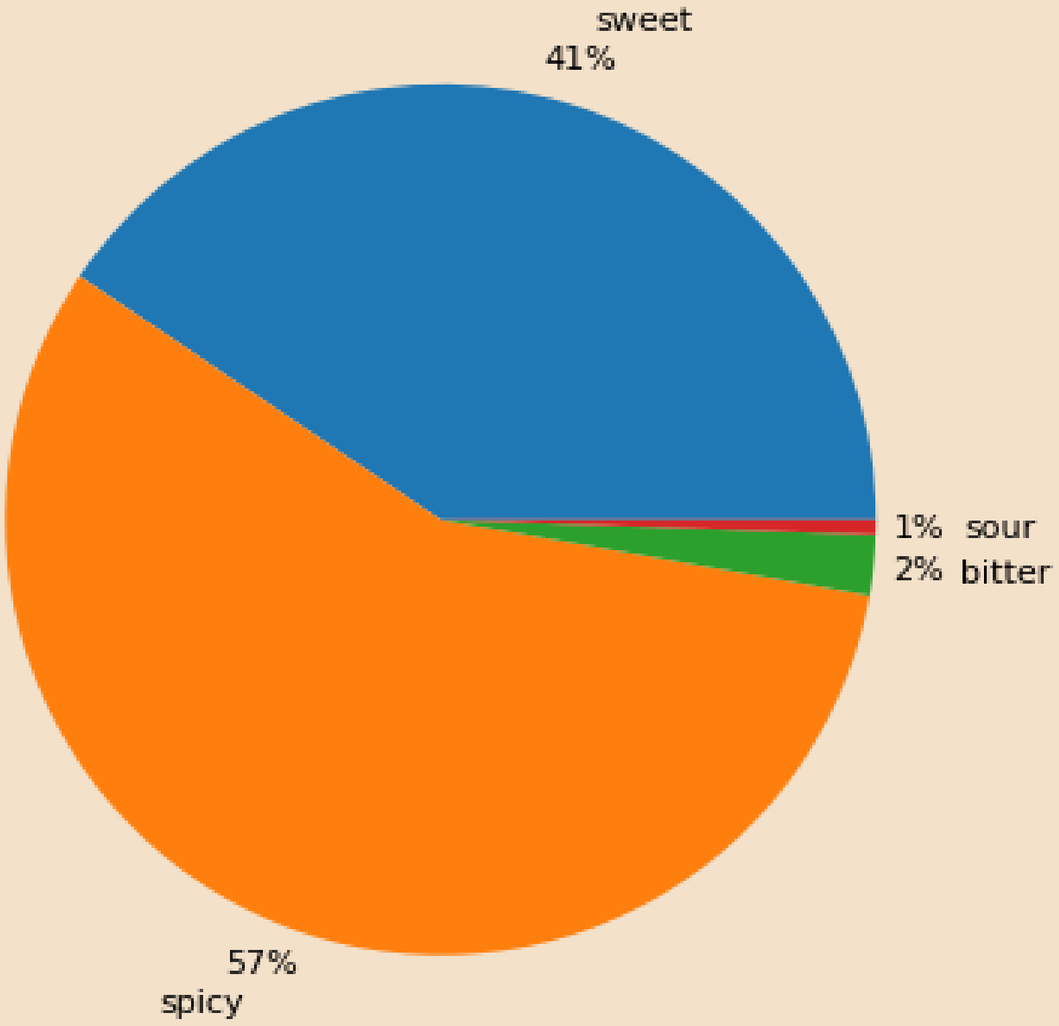


89% OF THE DATASET CONTAINED VEGETARIAN RECIPES. IN FACT, INDIA HAS THE HIGHEST POPULATION OF VEGETARIAN PEOPLE IN THE WORLD.

Percentage of dishes based on region

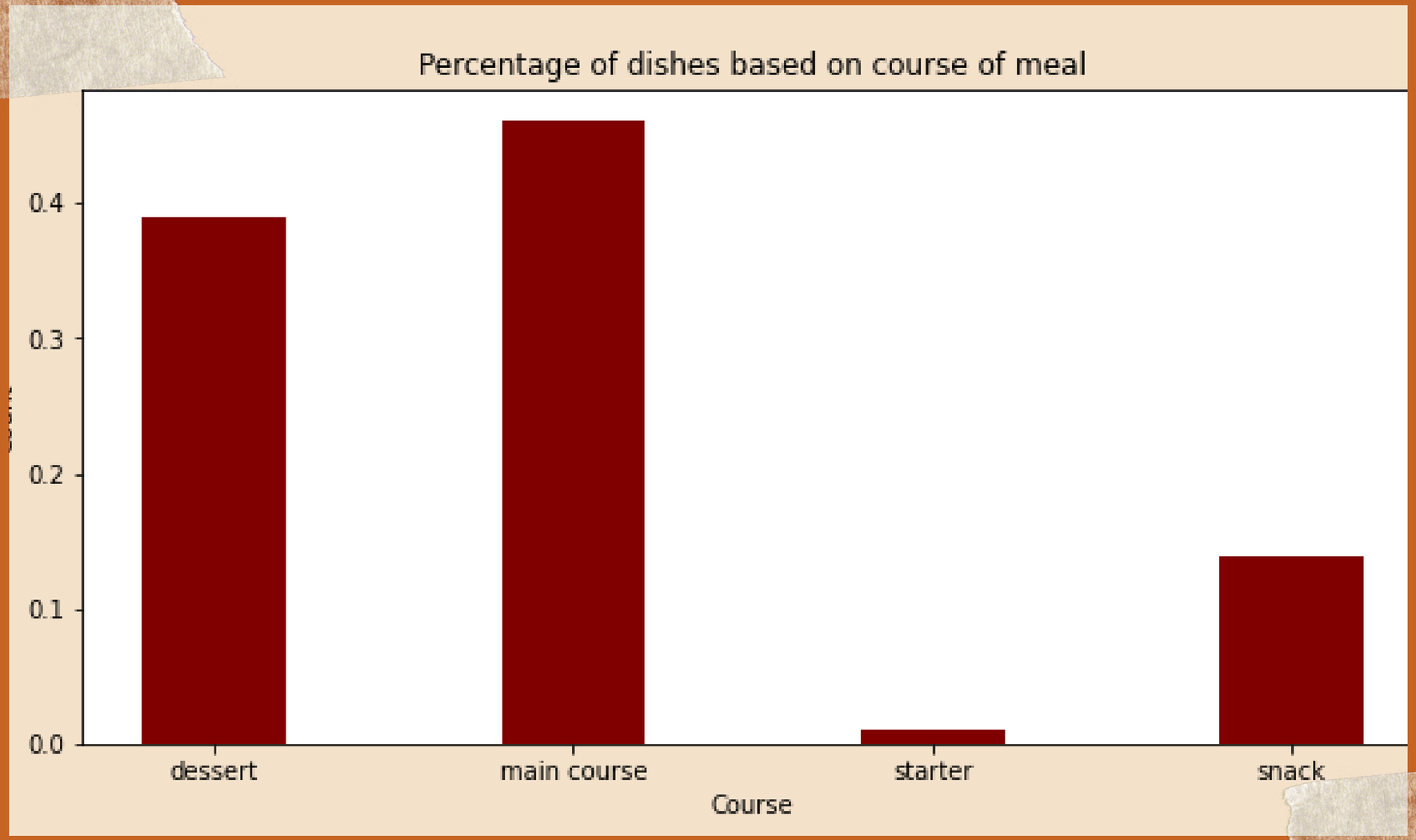


Proportion of Flavor Profiles



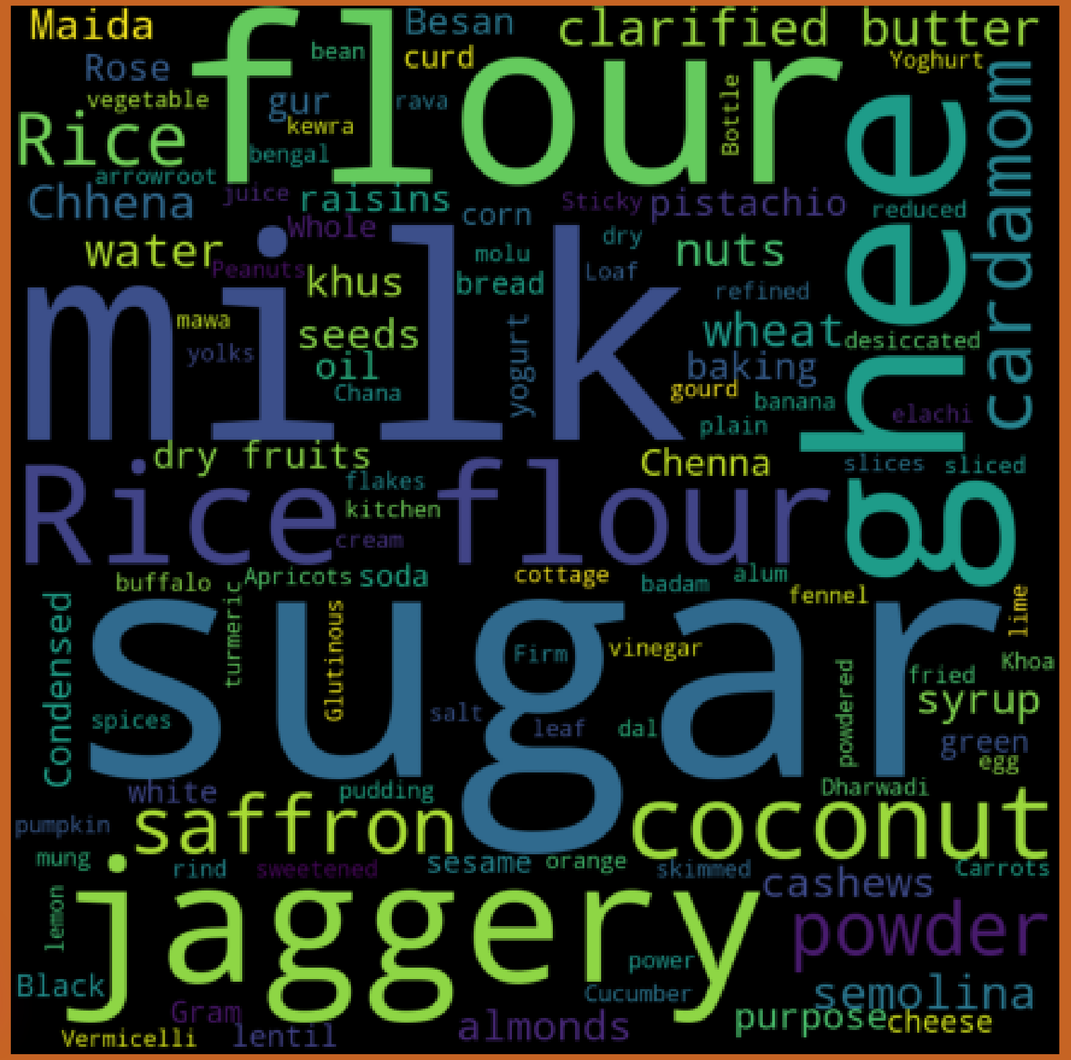
Indian Cuisine is famous for its spicy and sweet food.
India is the largest producer of spices in the world. This is because spices make the food hot, which is unfavorable for pathogens or bacteria to breed.
Sweets are a crucial part of Indian Cuisine. Every festival we celebrate involves the exchange of sweets and hence the graph.

Percentage of dishes based on course



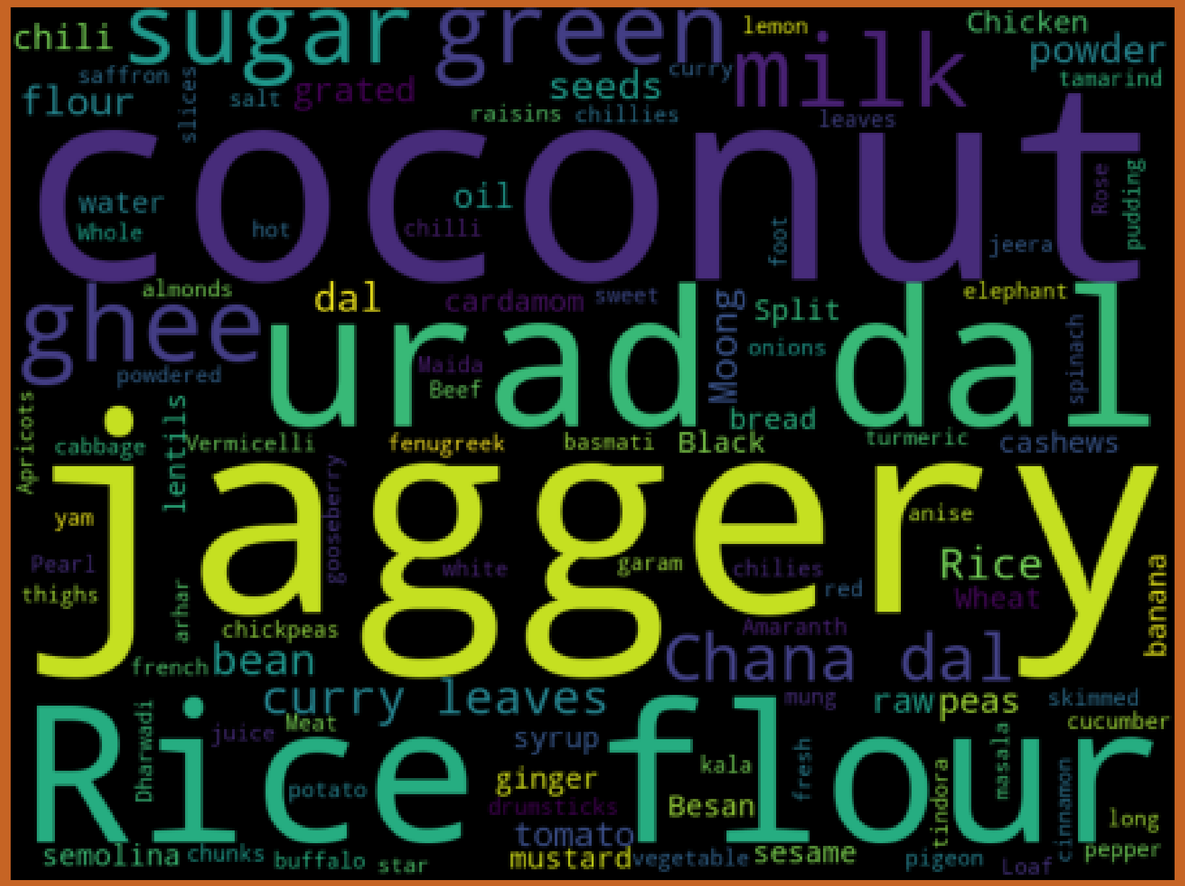
Main course and desserts are the most abundant type of course meals in Indian dishes

INGREDIENTS USED IN INDIAN DESSERTS



AS APPARENT FROM THE PLOT, SUGAR, JAGGERY, FLOUR AND MILK ARE THE MOST USED INGREDIENTS

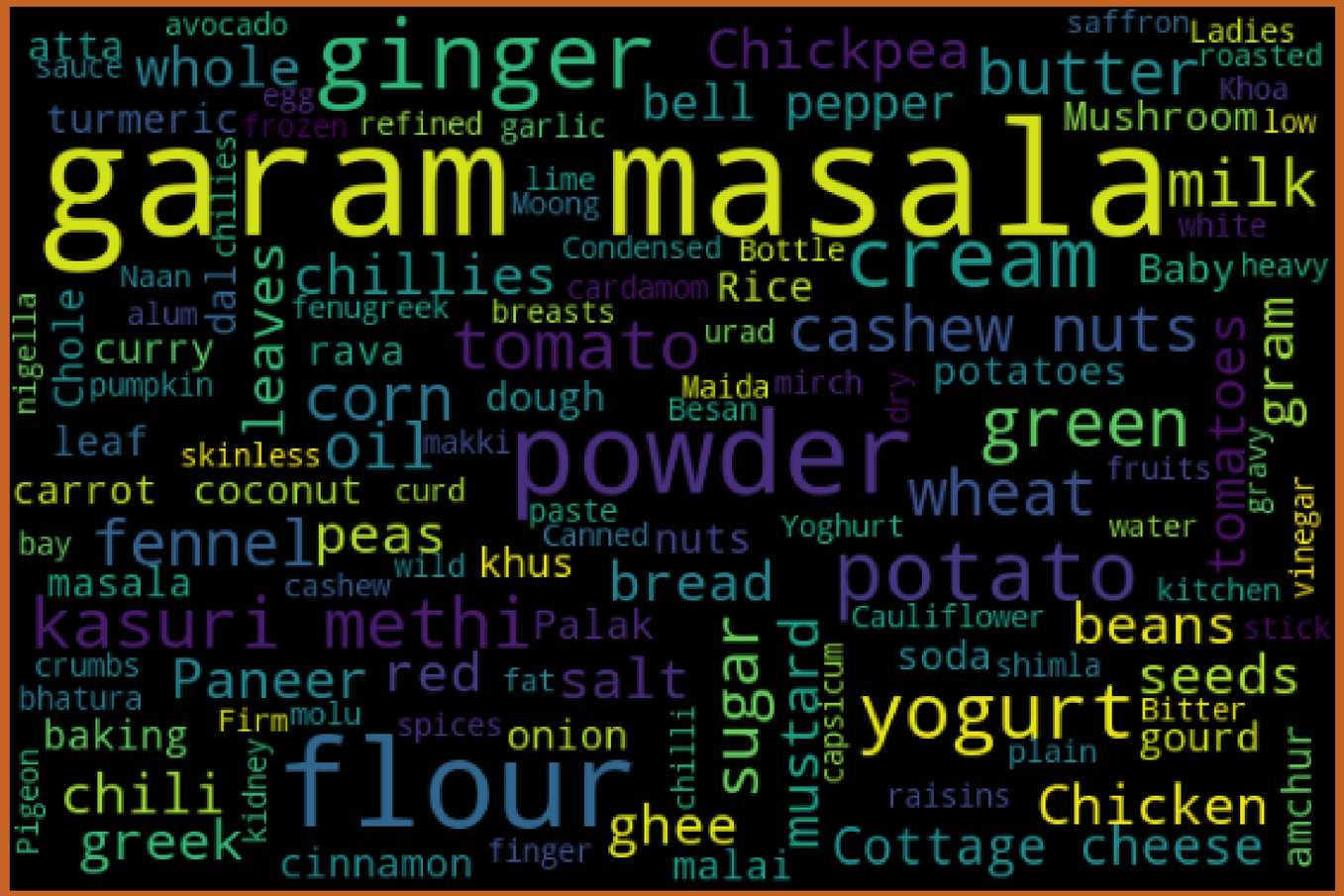
Ingredients used in South-Indian Cuisine



The South-Indian cuisine consists the dishes of five states: Andhra Pradesh, Karnataka, Tamil Nadu, Kerala, and Telangana.

The essence of the dishes come from the ingredients like coconut, urad dal, jaggery and rice flour as evident from the word plot.

Ingredients used in North-Indian Cuisine

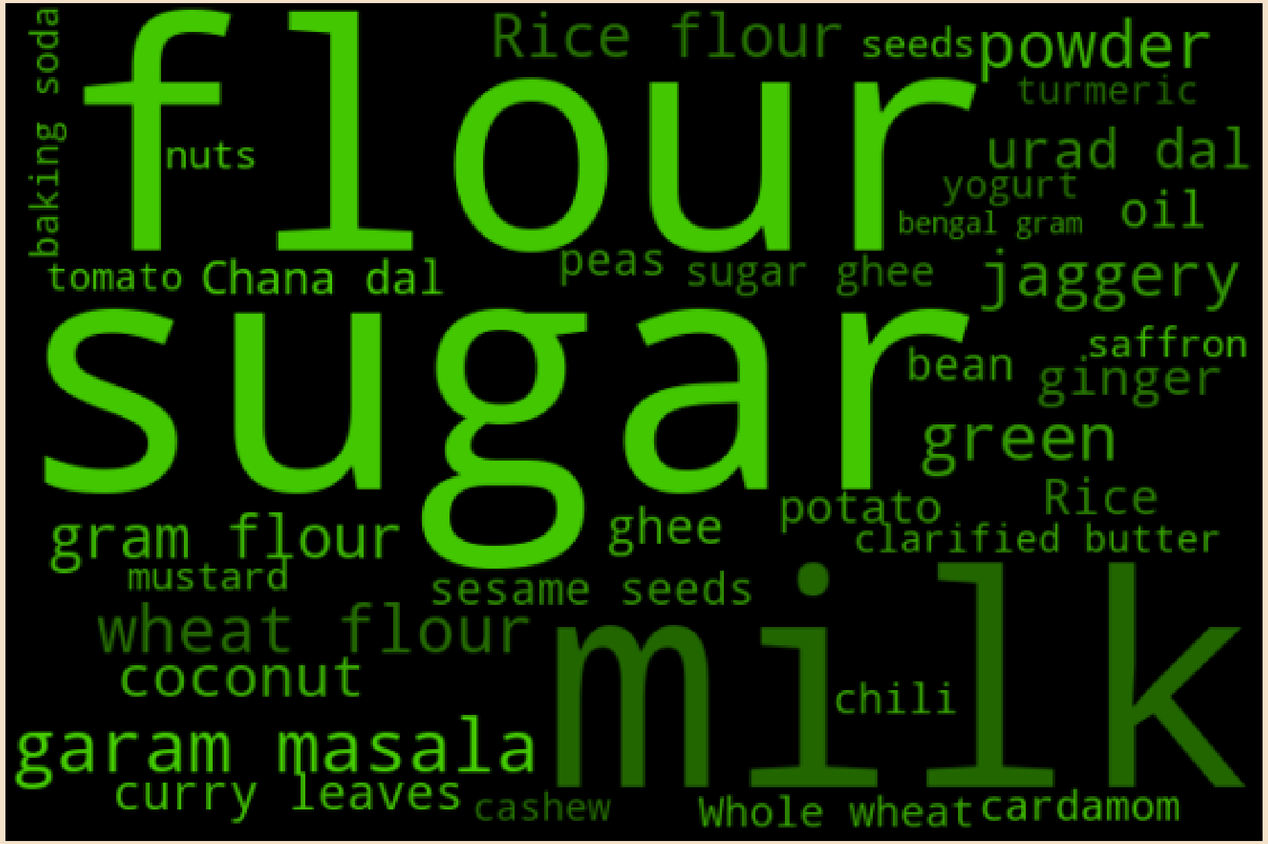


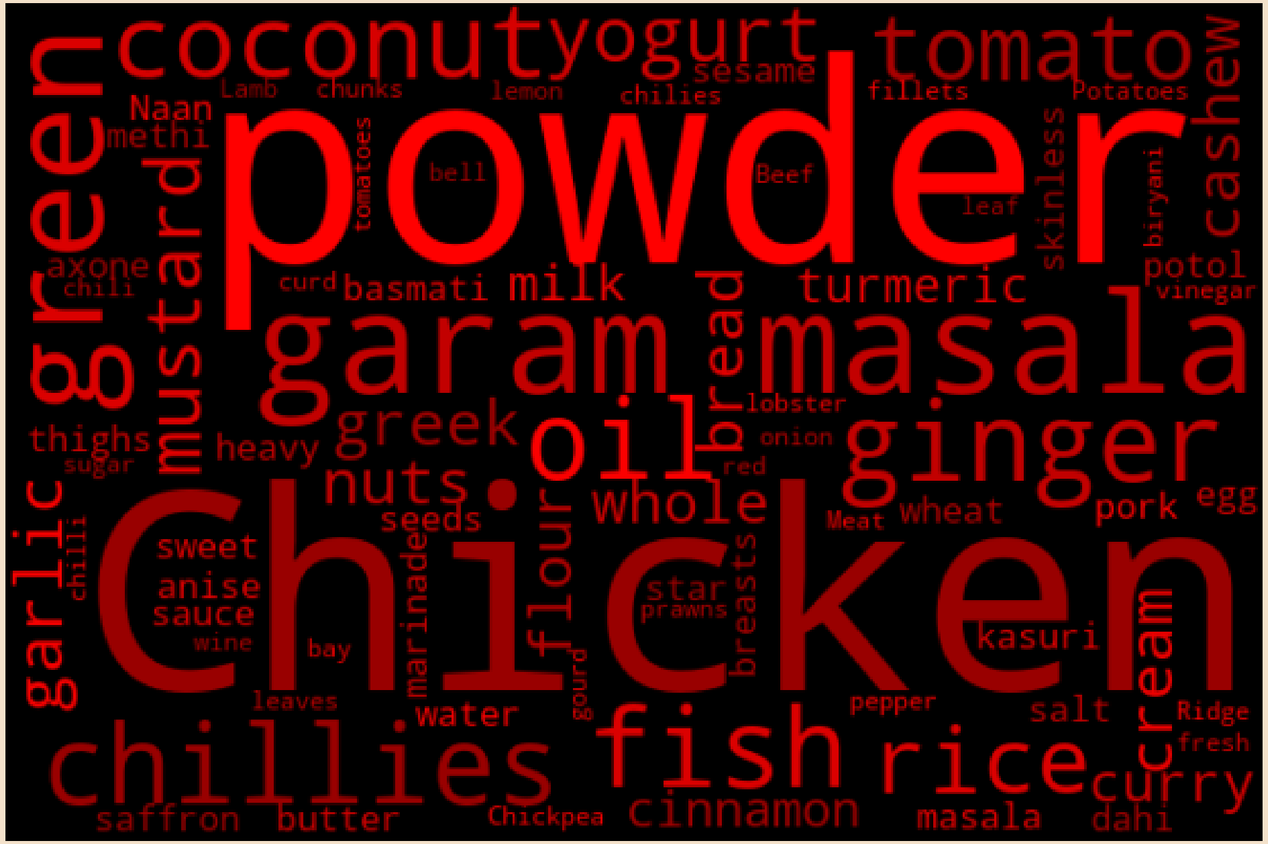
The North-Indian cuisine consists the dishes of seven states: Uttarakhand, Himachal Pradesh, Jammu and Kashmir, Delhi, Punjab, Haryana, and Uttar Pradesh.

The main cuisines are Mughlai, Kashmiri, Punjabi and Kumaoni.

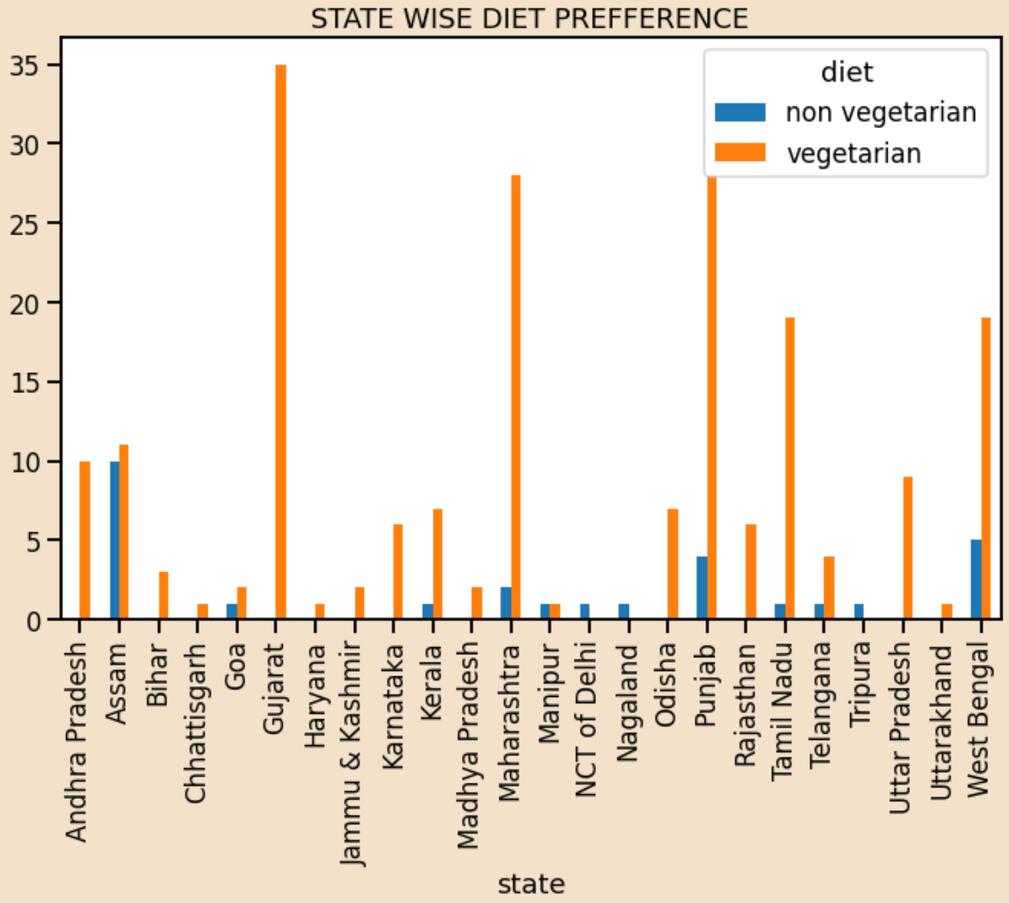
The essence of the dishes comes from spices like garam masala, ginger, chili, and ingredients like fllour and potaoes.

The two plots below distinguish the ingredients used in the vegetarian and non-vegetarian recipes of the Indian Cuisine.





State-wise dietary preferences

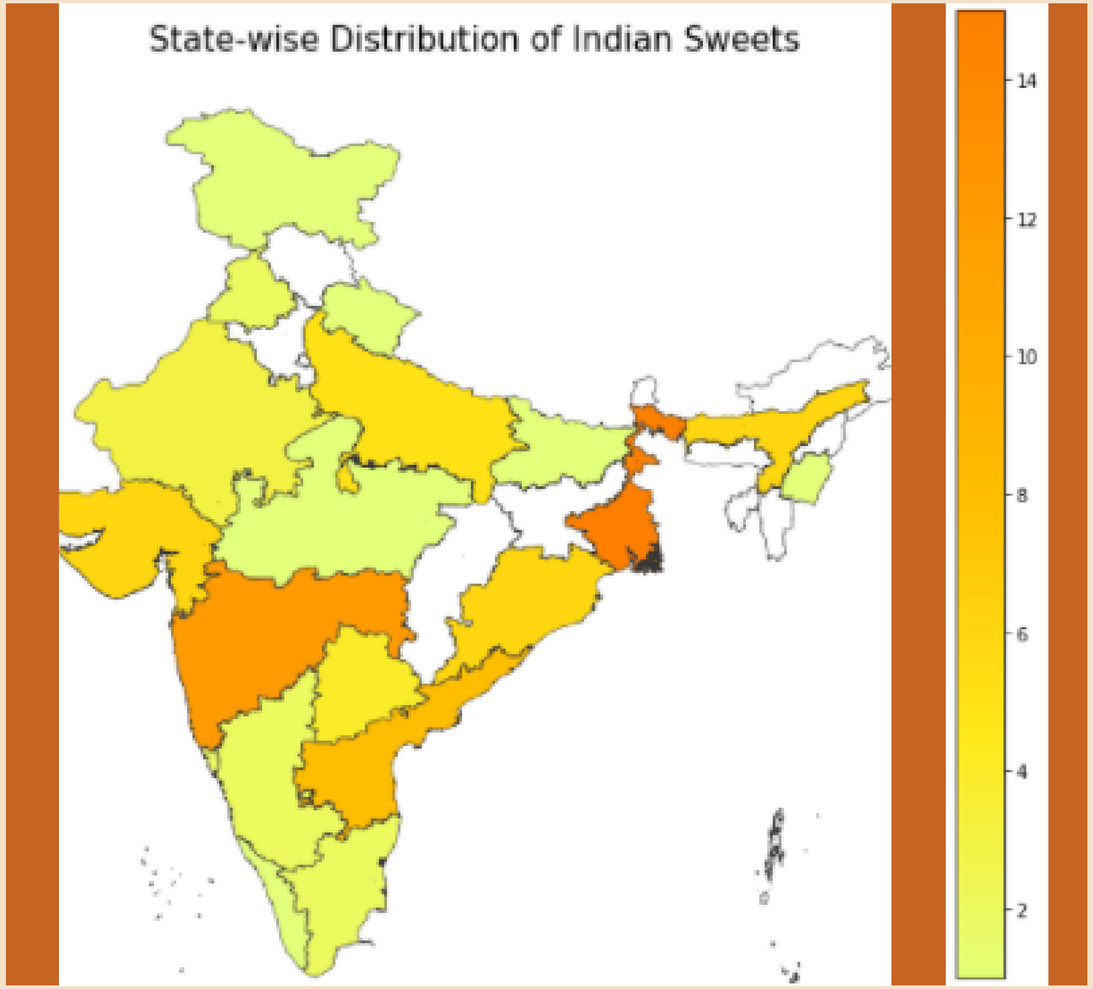


India has the second-lowest per capita meat intake in the world.

Most people in Gujarat eat vegetarian food.

In states like Assam, West Bengal and in coastal states, meat consumption is higher than the rest of the states.

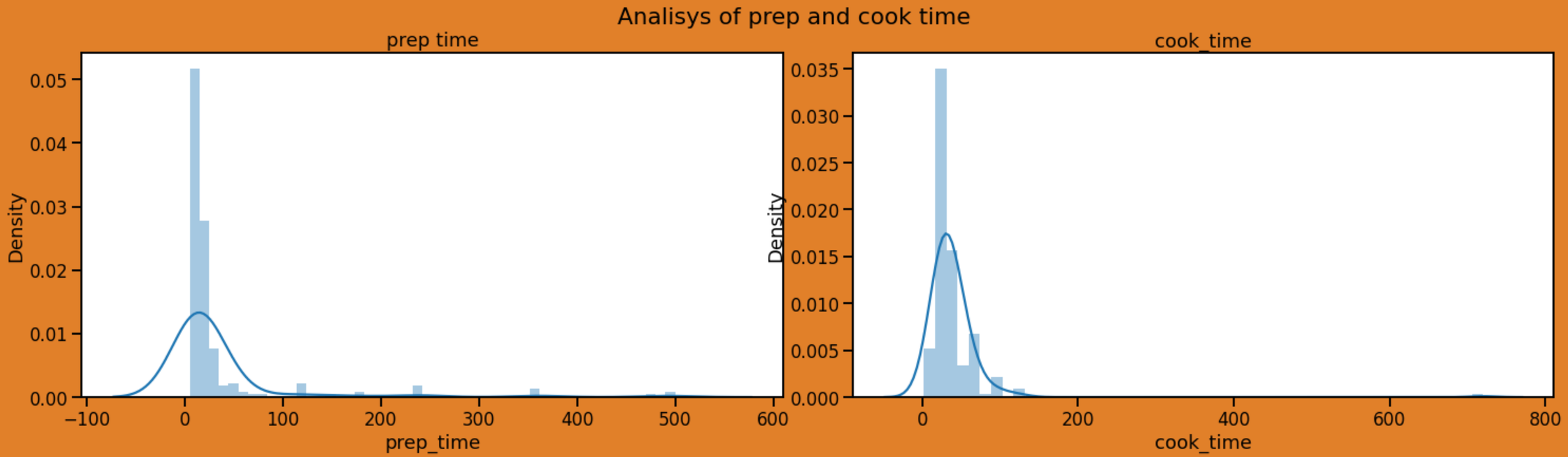
Which States eat the most Sweets?



OBSERVATIONS

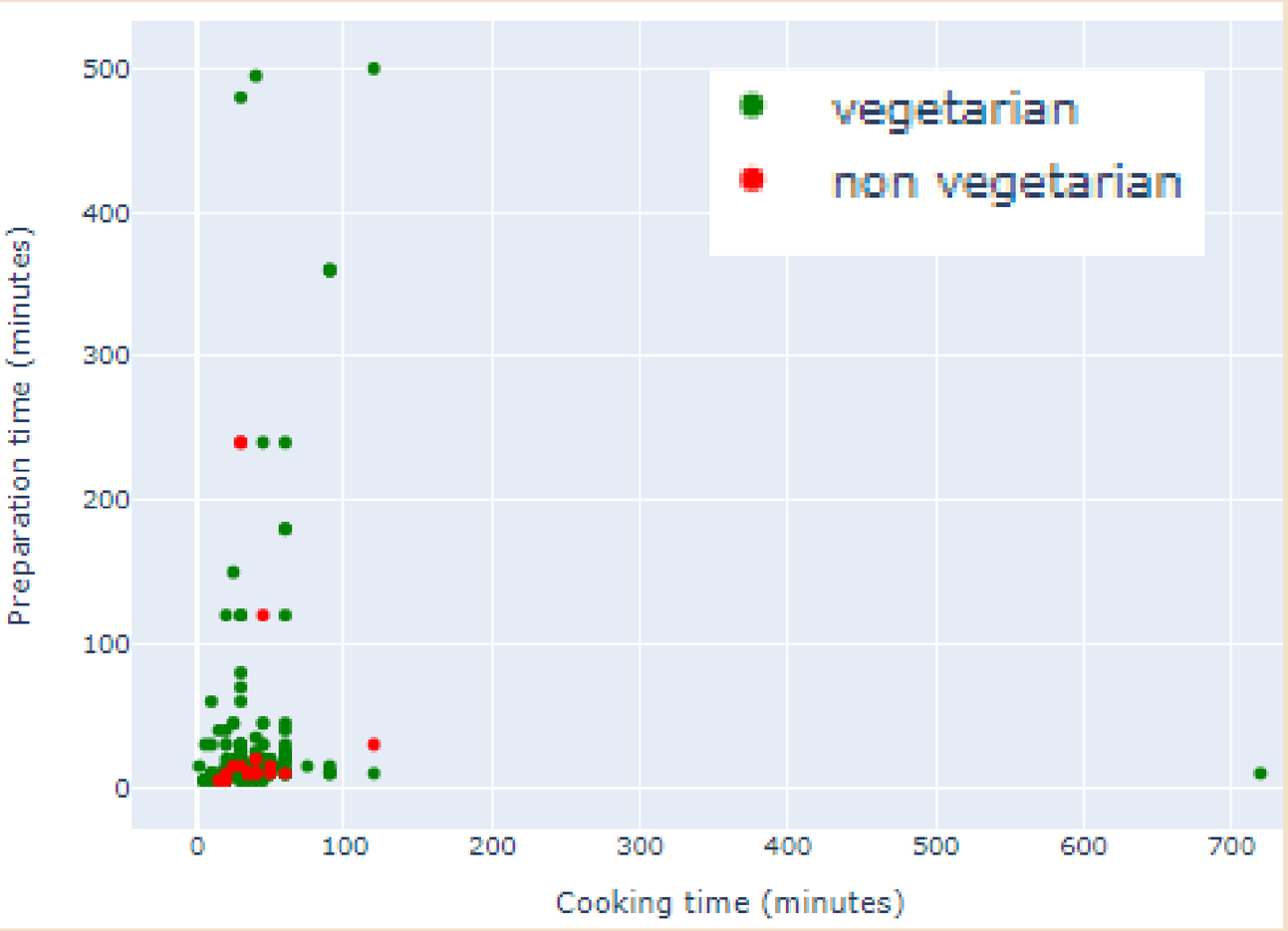
- People in West Bengal eat the most sweets
- India is famous for it's large varieties of sweets, which are an important part of Indian festivals and celebrations

PREPARATION TIME & COOKING TIME



As seen from the plots, most recipes have a cooking time of 20-60 minutes and a preparation time of 10-30 minutes. However, both the plots follow Gaussian distribution showing that most of the dishes have a mean time of preparation. Special dishes like Shrikhand and Biryani prepared on festivals take hours to cook

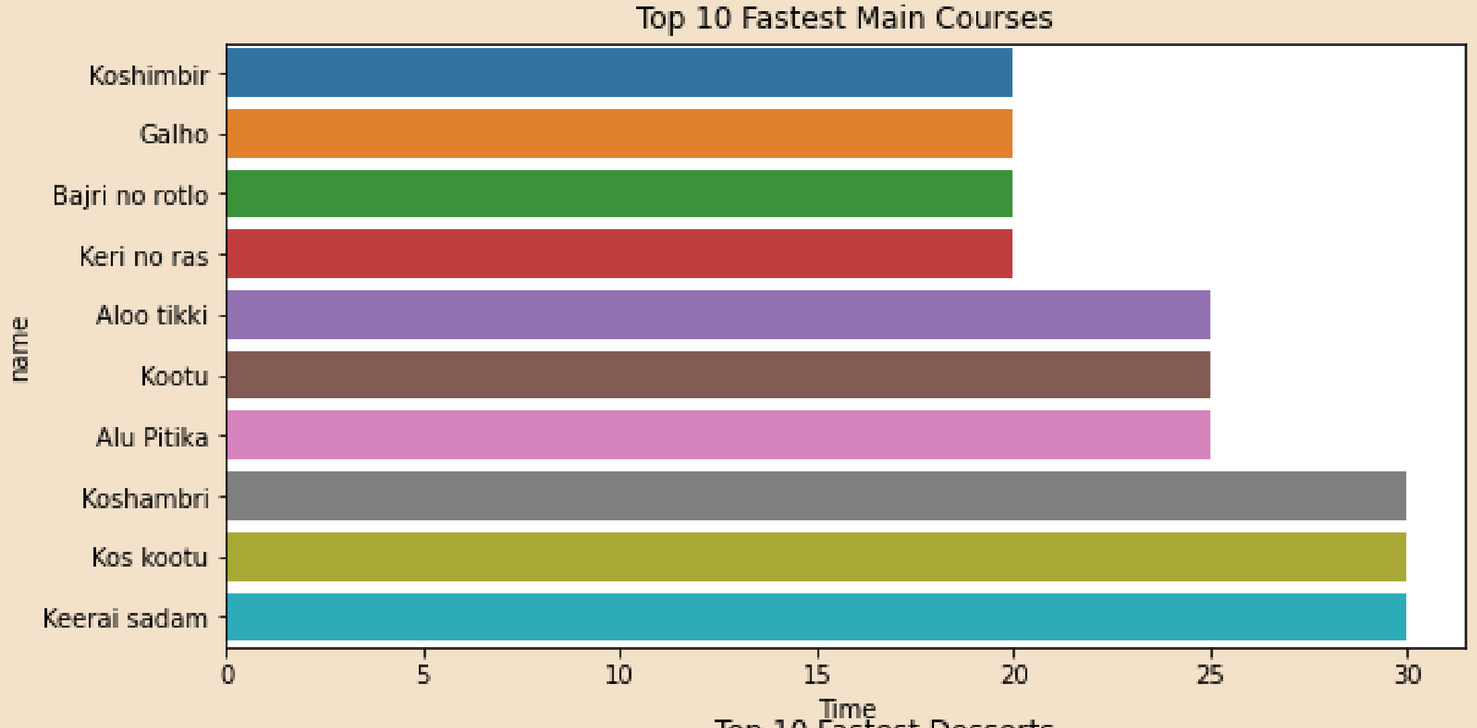
PREPARATION TIME & COOKING TIME FOR VEG AND NON-VEG DISHES

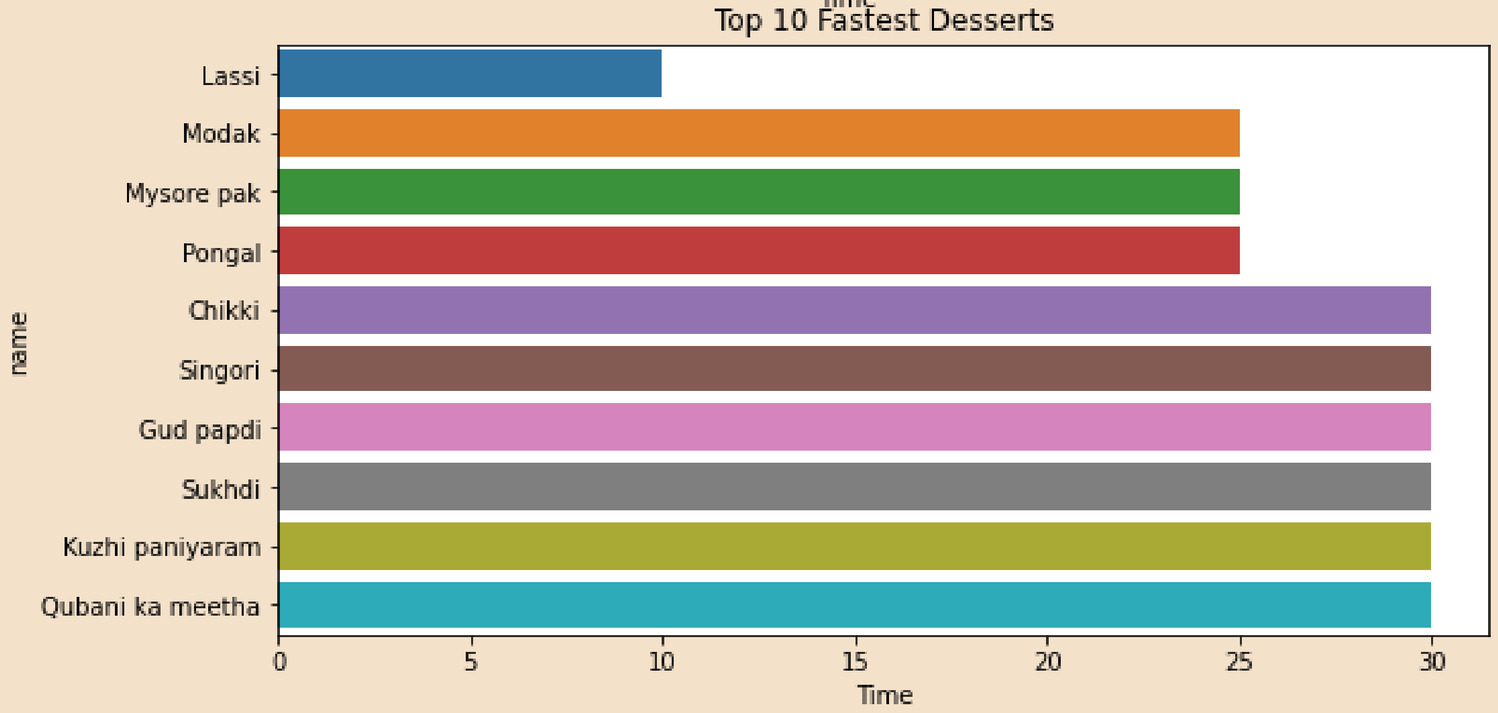


As seen from the plot, the cooking time of the vegetarian and non-vegetarian dishes are somewhat similar. However, the preparation time for the vegetarian dishes is more than that of non-veg dishes. There may be two reasons for the same: one, our dataset is biased as it has more vegetarian recipes; two, some desserts take much time to prepare, like Shrikhand.

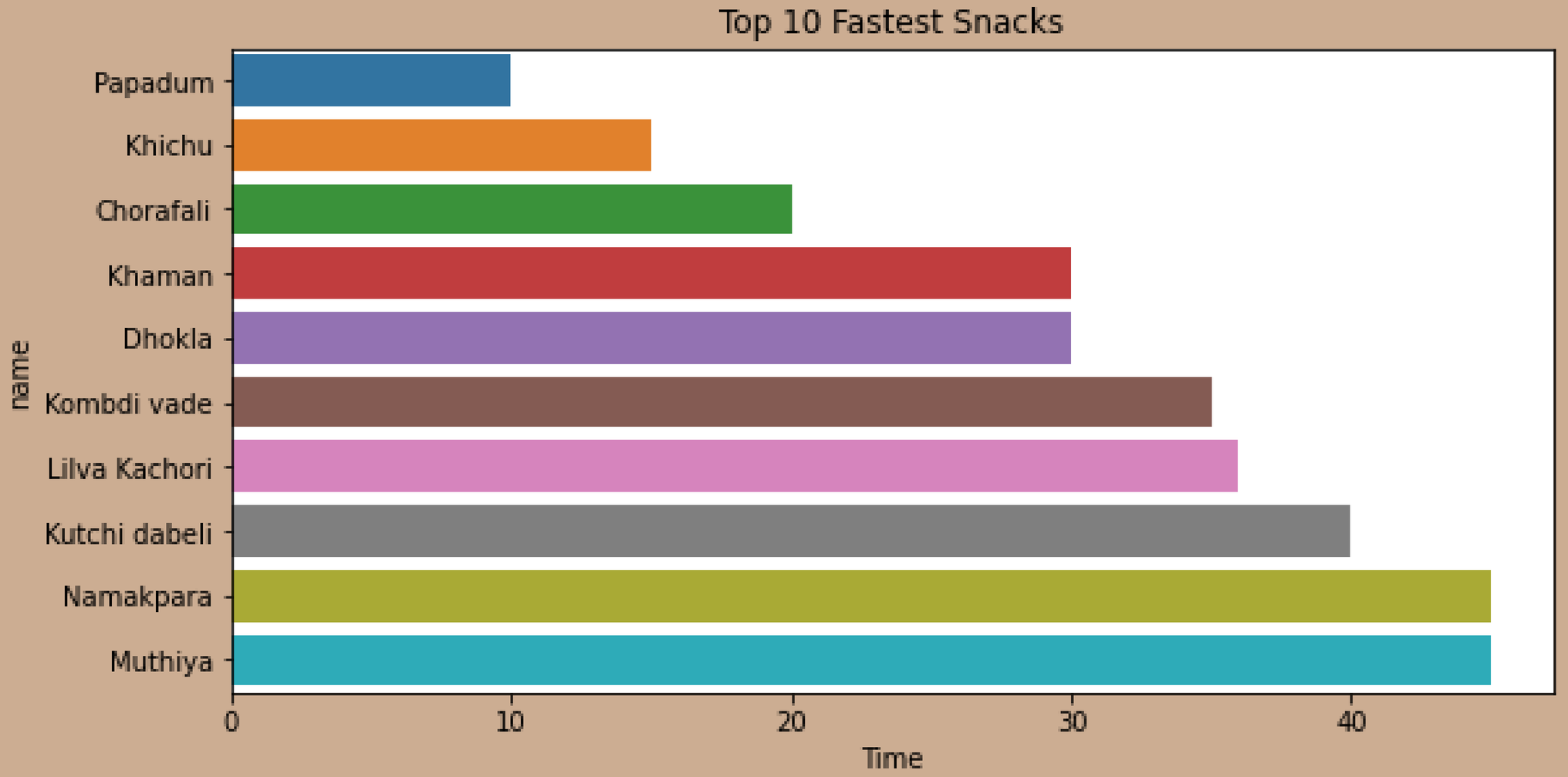
Top 10 fastest main courses and desserts

IF ONE HAS A HECTIC SCHEDULE, THEY CAN CHOOSE TWO DISHES (ONE FROM EACH PLOT) AND ENJOY THE FOOD ;)





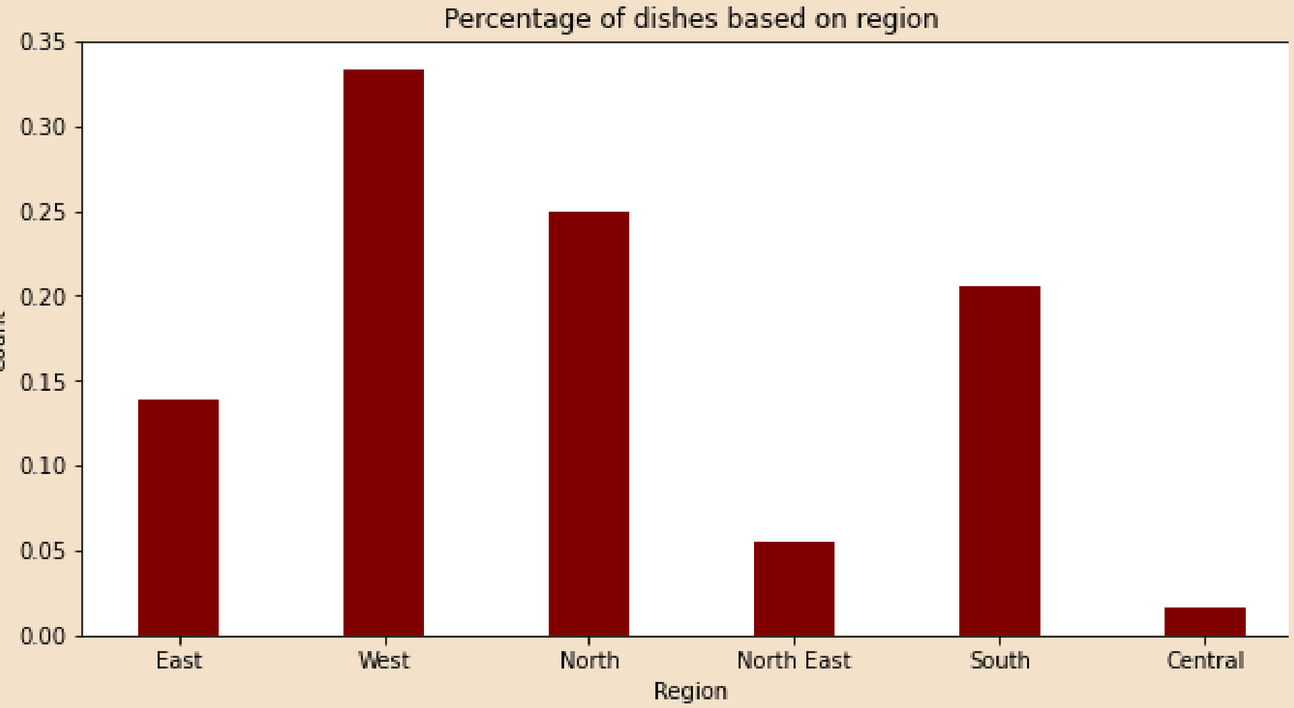
FASTEST SNACKS IN INDIAN CUISINE



REGION PREDICTION

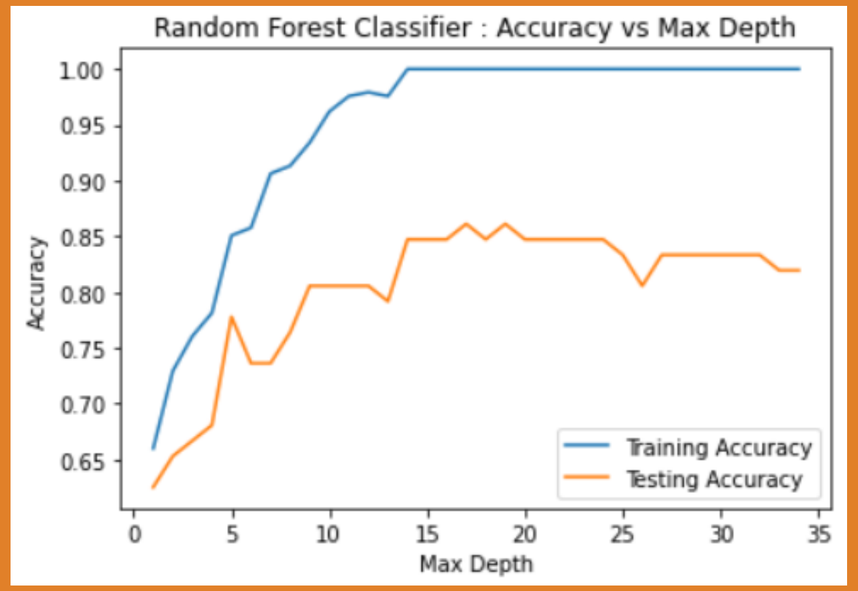
PREDICTION OF REGION(EAST, WEST,NORTH,SOUTH, CENTRAL) BASED ON DIET, PREP TIME ,COOK TIME, FLAVOR PROFILE, INGREDIENTS & COURSE

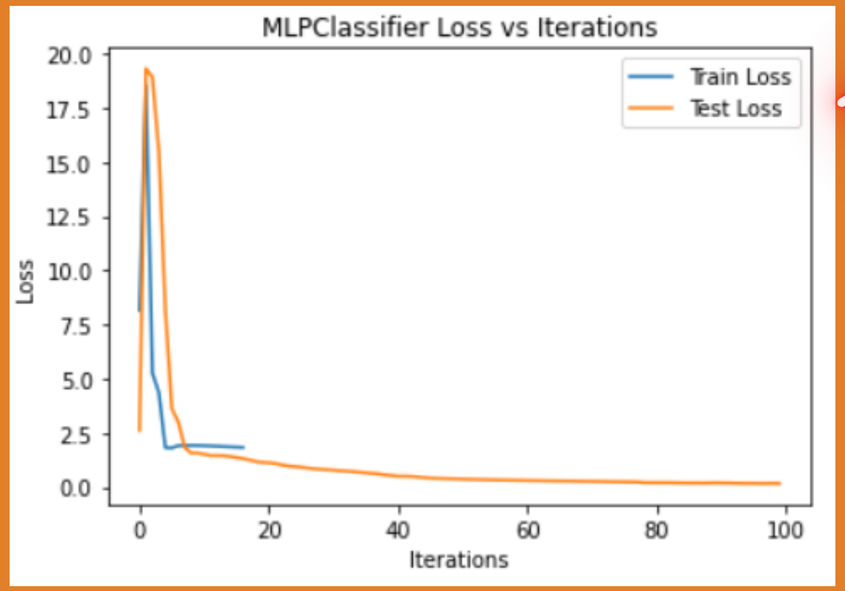
PREPROCESSING

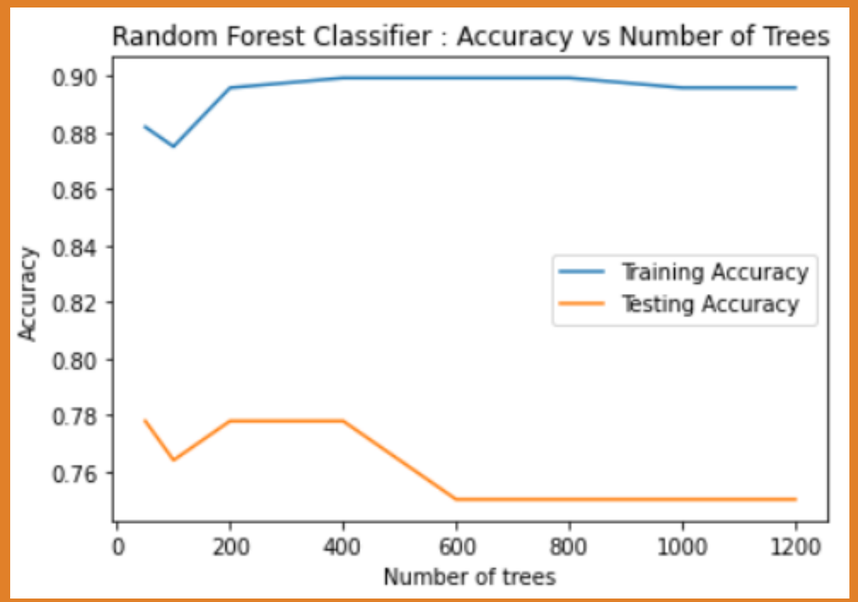


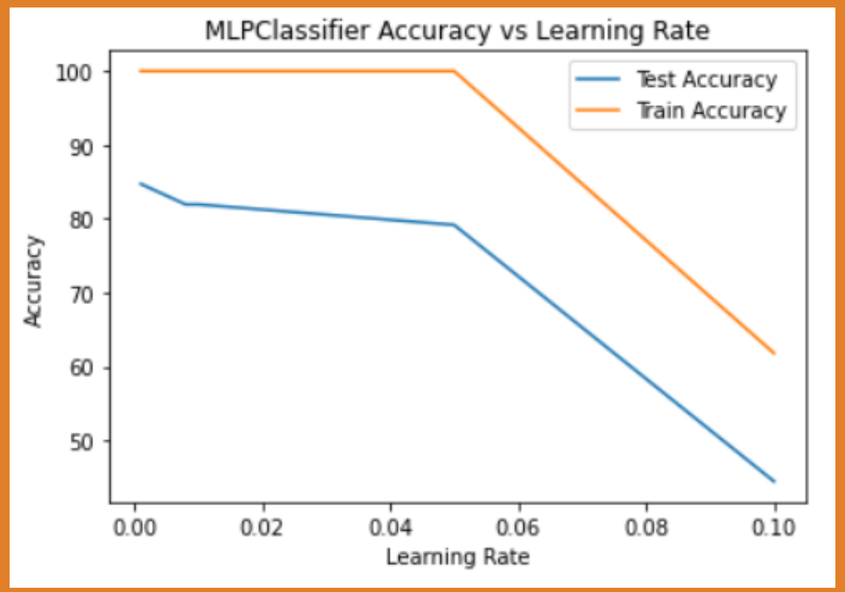
- One hot encoded the ingredients and the flavor profiles
- Models were predicting on the basis of 'state' feature so removed it to get better results based on diet, prep time ,cook time, flavor profile, ingredients & course
- Removed entire row wherever any entry was null.
- The number of entries for West region were more than others, so we oversampled the rest of the regions to get equal entries for all.

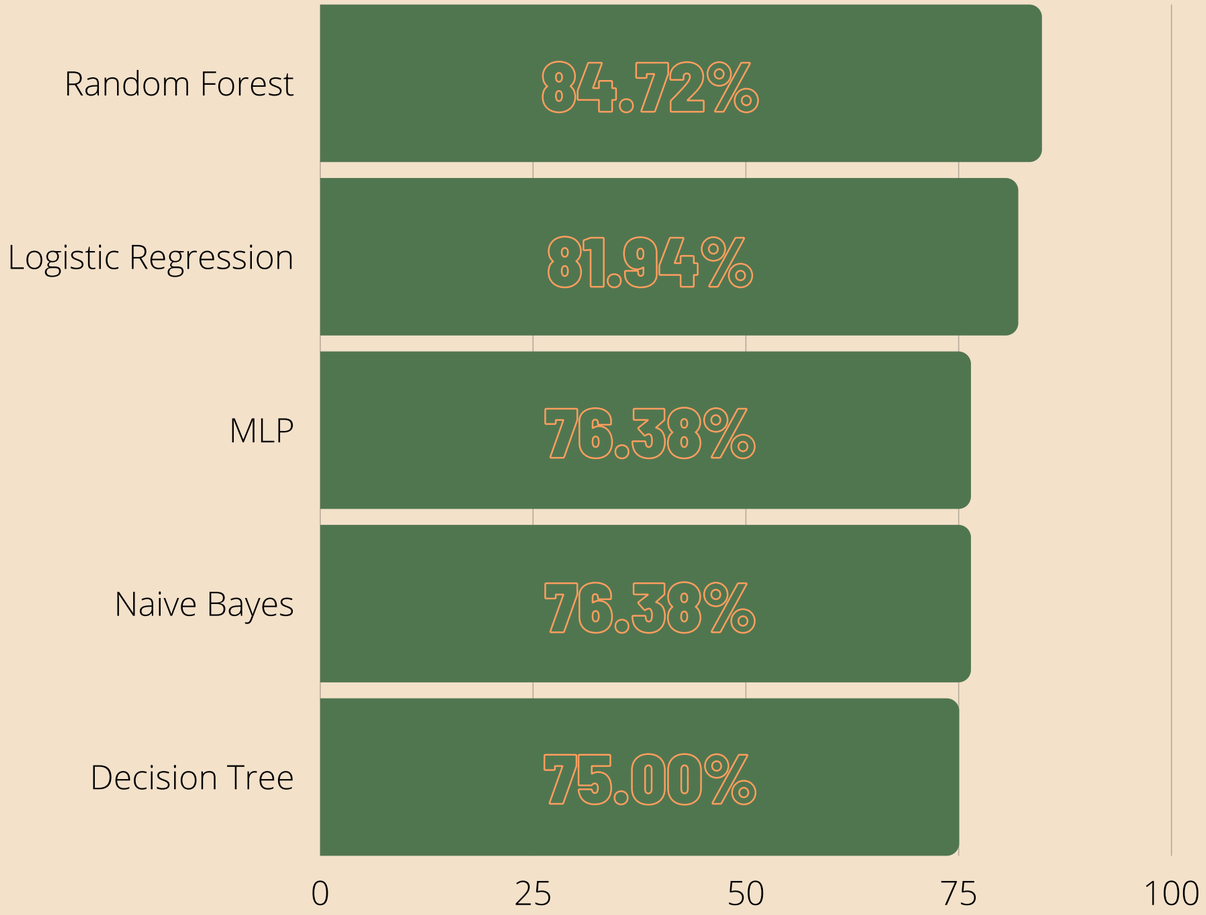
GRAPHS AND ANALYSIS







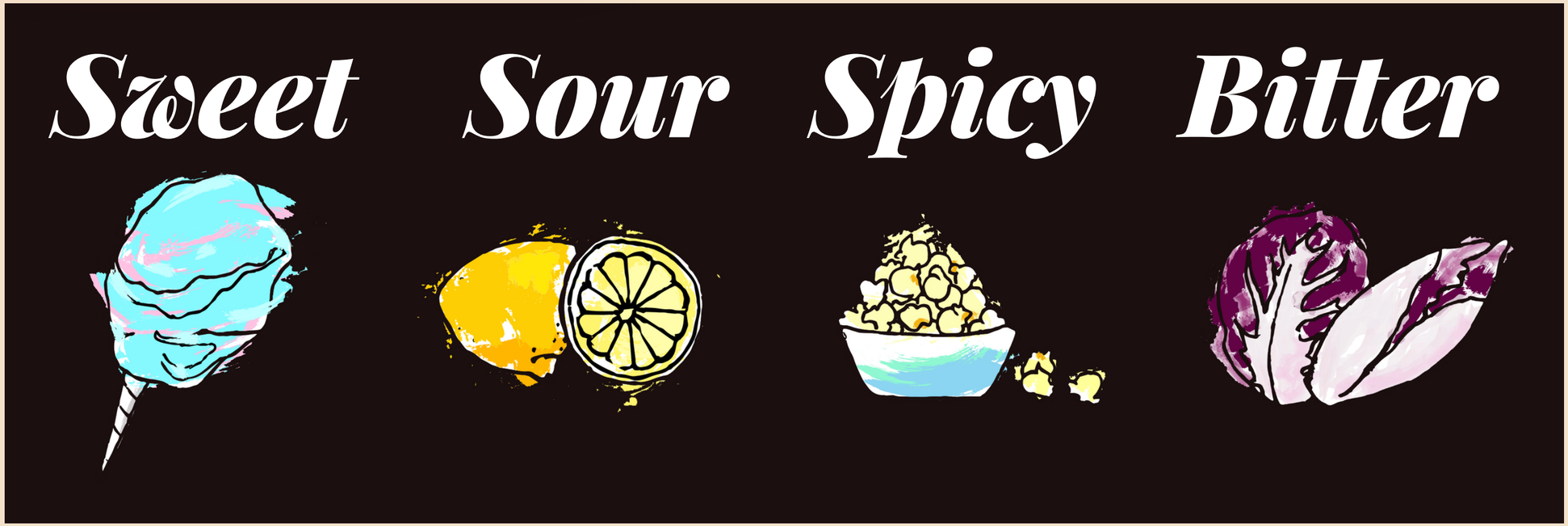




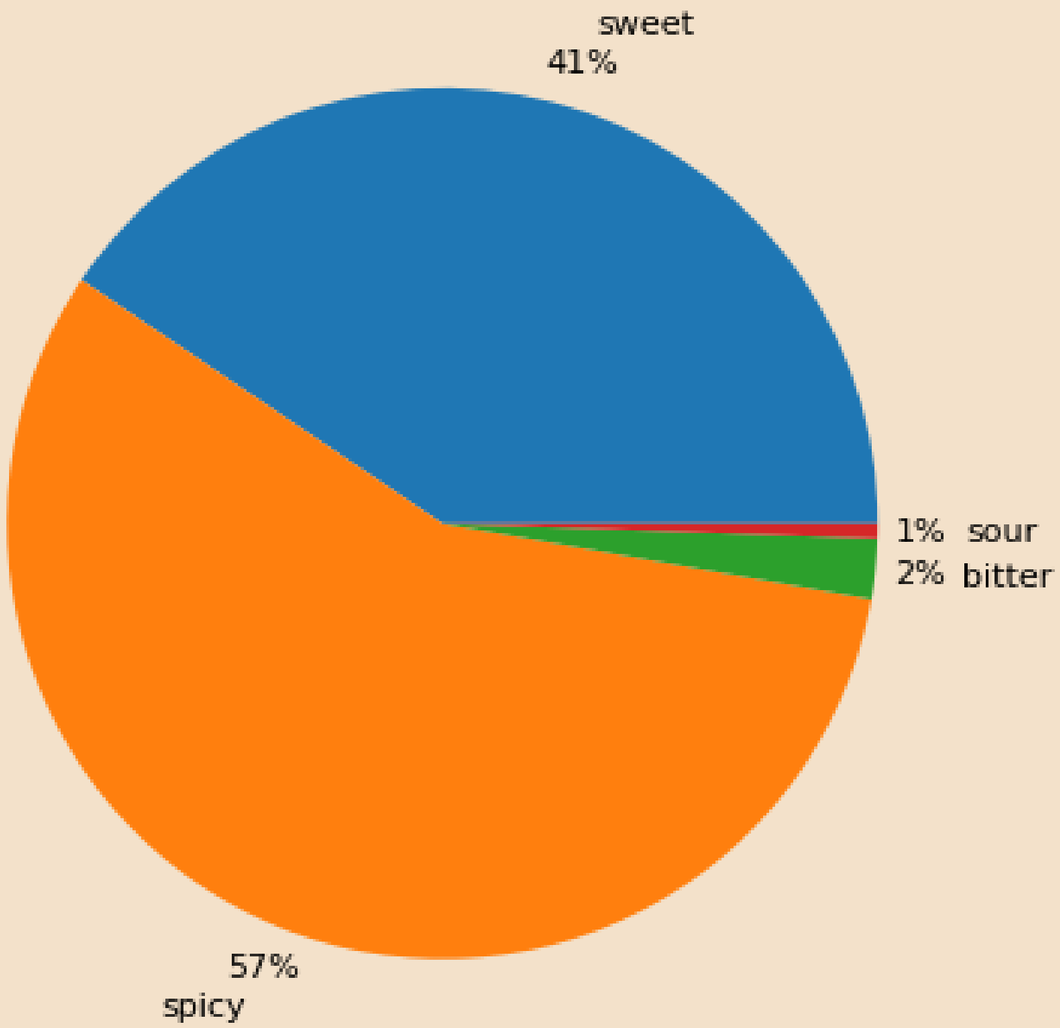
RESULTS

- We were able to predict Region of a recipe with an average accuracy of 78.88%
- Random Forest gave the best accuracy (84.72%) followed by Logistic Regression (81.94%)

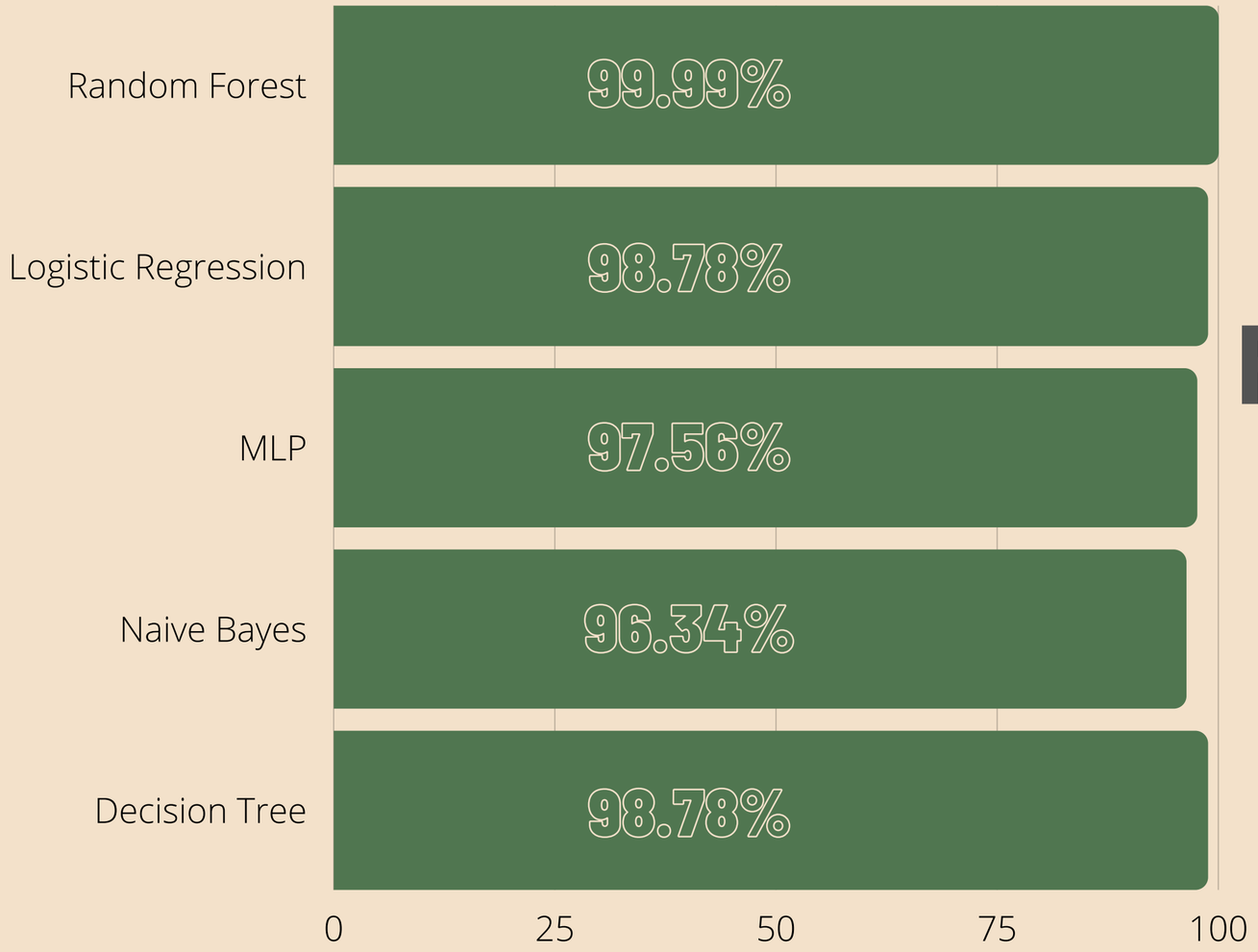
FLAVOR PROFILE PREDICTION



PREPROCESSING



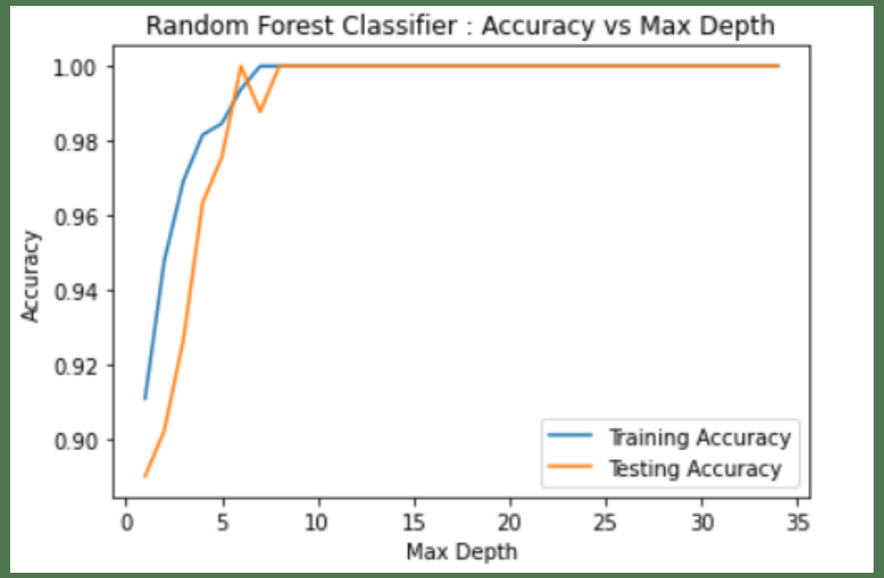
- One hot encoded the ingredients
- Removed entire row wherever any entry was null.
- The number of entries for Sweet and Spicy were region were more than others, so we oversampled the rest of the flavor profiles to get equal entries for all.

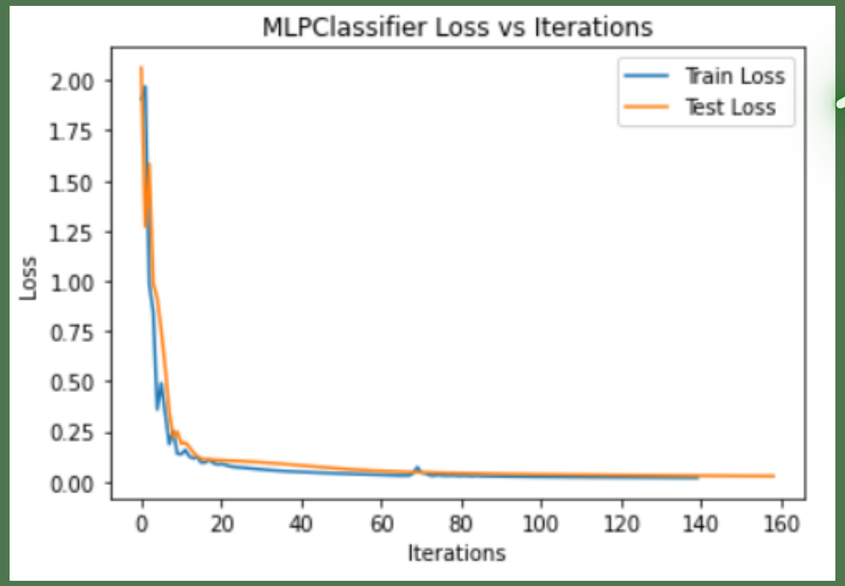


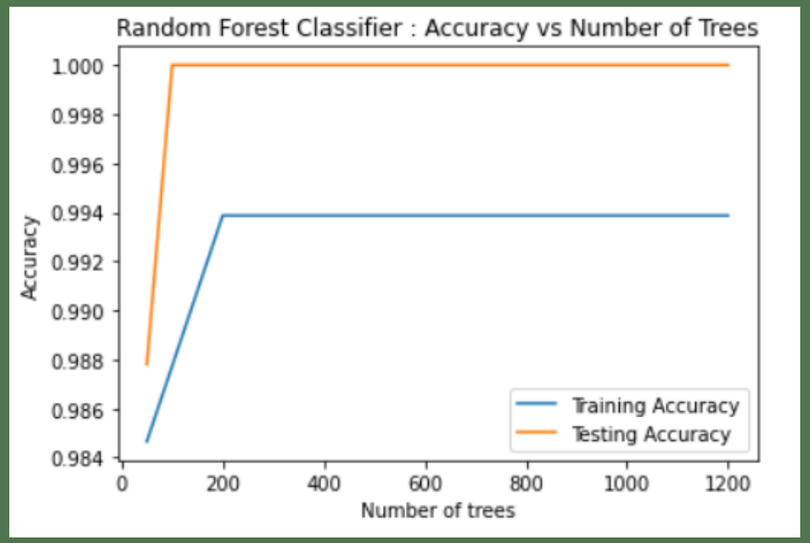
RESULTS

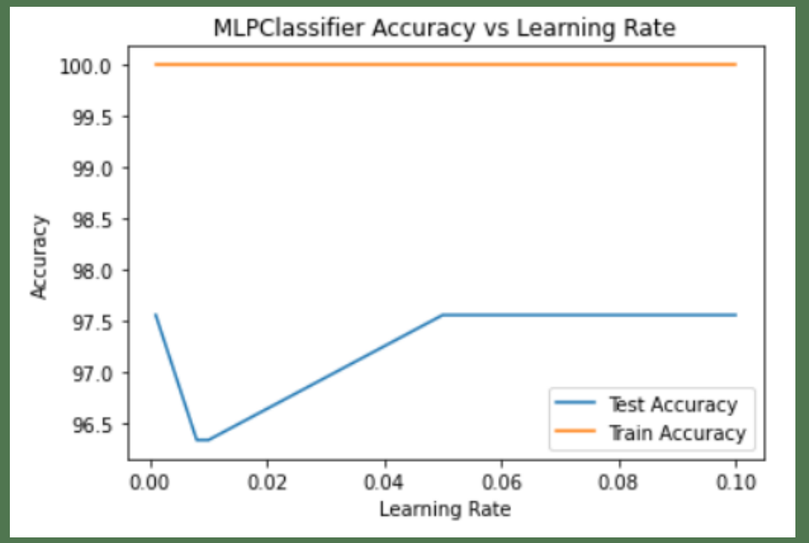
- We were able to predict the Flavor profile of a recipe with an amazing average accuracy of 98.29%
- Random Forest gave the best accuracy (99.99%) followed by Logistic Regression and Decision Tree (98.78% for both)

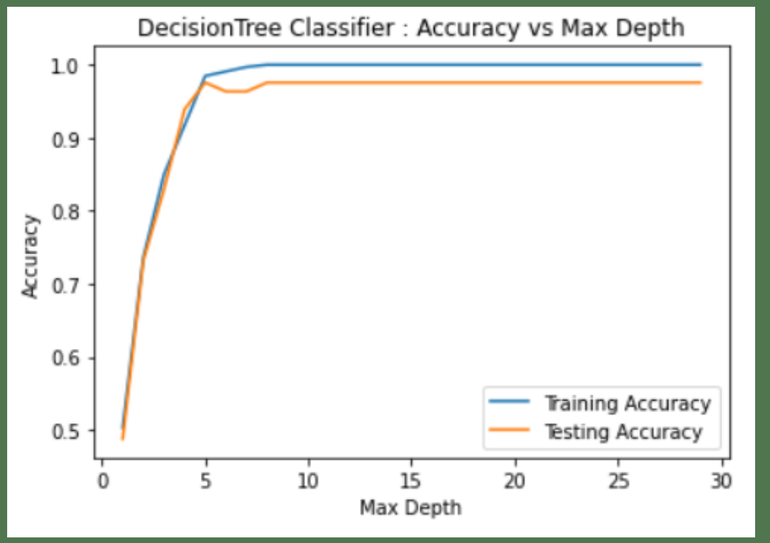
GRAPHS AND ANALYSIS











THANK YOU