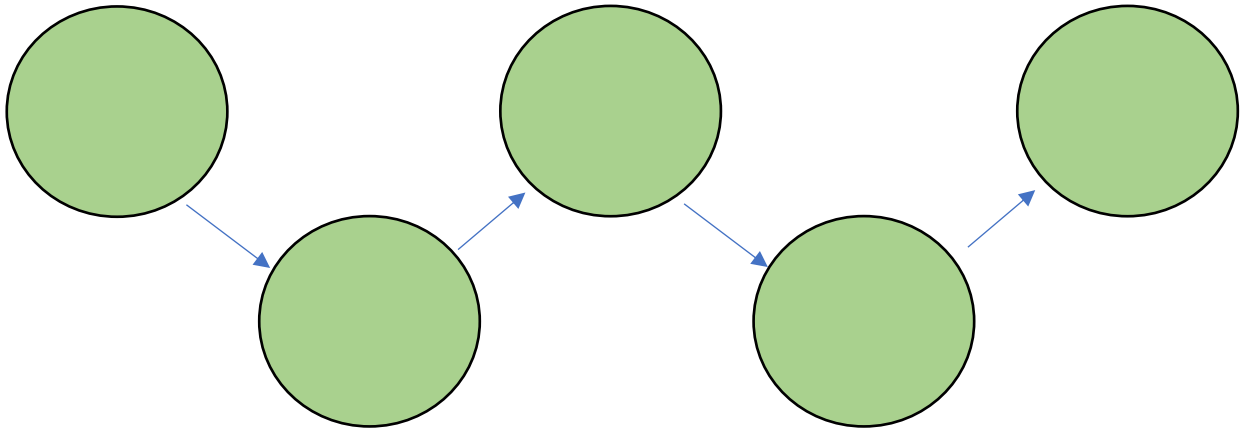
AI PROJECT CYCLE

But, before we get deeper into data analysis, let us recall how Data Sciences can be leveraged to solve some of the pressing problems around us.

For this, let us understand the AI project cycle framework around Data Sciences with the help of an example. Do you remember the AI Project Cycle? Fill in all the stages of the cycle here:

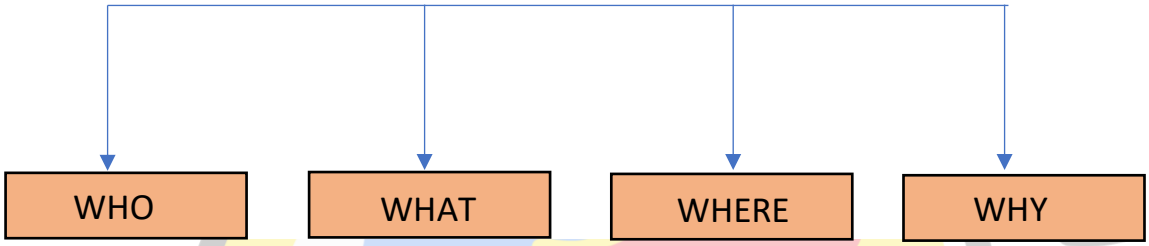


Humans are social animals. We tend to organise and/or participate in various kinds of social gatherings all the time. We love eating out with friends and family because of which we can find restaurants almost everywhere and out of these, many of the restaurants arrange for buffets to offer a variety of food items to their customers.

Be it small shops or big outlets, every restaurant prepares food in bulk as they expect a good crowd to come and enjoy their food. But in most cases, after the day ends, a lot of food is left which becomes unusable for the restaurant as they do not wish to serve stale food to their customers the next day. So, every day, they prepare food in large quantities keeping in mind the probable number of customers walking into their outlet.

But if the expectations are not met, a good amount of food gets wasted which eventually becomes a loss for the restaurant as they either have to dump it or give it to hungry people for free. And if this daily loss is taken into account for a year, it becomes quite a big amount.

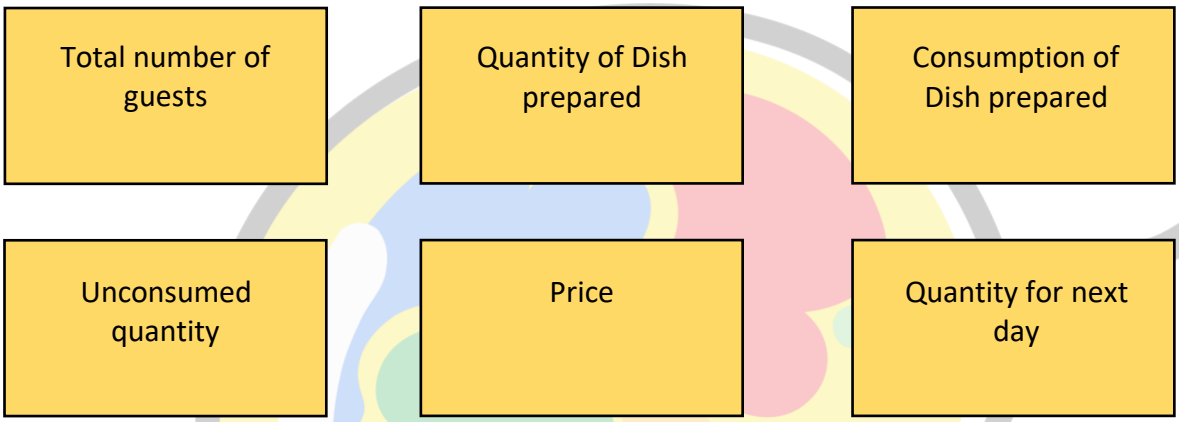
Problem Scoping Now that we have understood the scenario well, let us take a deeper look into the problem to find out more about various factors around it. Let us fill up the 4Ws problem canvas to find out.



WHO IS HAVING THE PROBLEM	WHAT IS THE PROBLEM	WHERE DOES IT ARISE FROM	WHY DOES IT ARISE
Restaurants Providing Buffets	More than required food is made everyday by the restaurants	Buffet and normal restaurants	If the restaurant has a proper estimate of the quantity of food to be prepared
Restaurant chefs	It is either thrown away or given to needy people for free	When no more consumption is required for the day	every day, the food waste can be reduced.

1. Data Acquisition

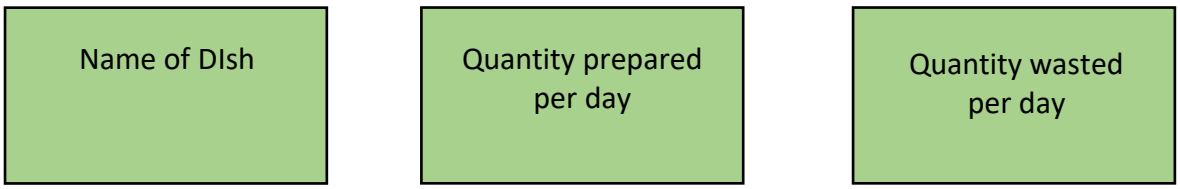
After finalising the goal of our project, let us now move towards looking at various data features which affect the problem in some way or the other. Since any AI-based project requires data for testing and training, we need to understand what kind of data is to be collected to work towards the goal. In our scenario, various factors that would affect the quantity of food to be prepared for the next day consumption in buffets would be:



Now let us understand how these factors are related to our problem statement. Hence using the above data and collecting it for 30 days and making a proper dataset then using it to understand the needs and demand for a particular dish. It will help reduce the cost as well as the wastage occurring and the loses the company has to bear.

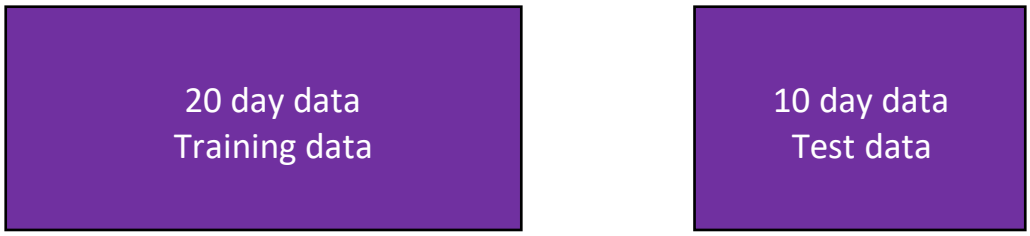
2. Data Exploration

After creating the database, we now need to look at the data collected and understand what is required out of it. In this case, since the goal of our project is to be able to predict the quantity of food to be prepared for the next day, we need to have the following data: Thus, we extract the required information from the curated dataset and clean it up in such a way that there exist no errors or missing elements in it.



3. Modelling

Once the dataset is ready, we train our model on it. In this case, a regression model is chosen in which the dataset is fed as a dataframe and is trained accordingly. Regression is a Supervised Learning model which takes in continuous values of data over a period of time. Since in our case the data which we have is a continuous data of 30 days, we can use the regression model so that it predicts the next values to it in a similar manner. In this case, the dataset of 30 days is divided in a ratio of 2:1 for training and testing respectively. In this case, the model is first trained on the 20-day data and then gets evaluated for the rest of the 10 days. Hence the model predicts the wastage and production of the dish.



4. Evaluation

Once the model has been trained on the basis of the 20 day training data it is tested on the 10 day test data. The training data is given to the machine and it calculates everything, for example if there are 500 customers a day and 200 of them eat noodles and each of them eat half plate on an average hence 20 kg of noodles are made everyday, this happens with all the dishes that the machine knows and when new data is fed to it, the machine predicts how much noodles should be made on the next day.