Project Objective:

The primary goal of this data science project is to analyze and understand the trends, patterns, and factors influencing food prices in Pakistan. By leveraging data, the project aims to provide valuable insights for policymakers, researchers, and the general public to make informed decisions about food consumption, pricing strategies, and potential interventions.

Data Acquisition:

The dataset that we used is from kaggle.

https://www.kaggle.com/datasets/amaanfaheem/pakistan-food-prices-2022

The dataset contains food prices data for Pakistan, sourced from the World Food Programmed Price Database.

Dataset description:

Data Set is contains on 9723 rows × 14 columns

Dataset Columns:
['date', 'Provinces name', 'City Name', 'City market', 'latitude', 'longitude', 'category', 'commodity', 'unit', 'price flag','price type', 'currency', 'price', 'usd price']

RangeIndex: 9723 entries, 0 to 9722
Data columns (total 14 columns):

#	Column	Non-Null Count	Dtype
0	date	9723 non-null	object
1	Provinces name	9723 non-null	object

2	City Name	9723 non-null	object
3	City market	9723 non-null	object
4	latitude	9723 non-null	float64
5	longitude	9723 non-null	float64
6	category	9723 non-null	object
7	commodity	9723 non-null	object
8	unit	9723 non-null	object
9	price flag	9723 non-null	object
10	price type	9723 non-null	object
11	currency	9723 non-null	object
12	price	9723 non-null	float64
13	usd price	9723 non-null	float64

dtypes: float64(4), object(10)

We have Applied Different Data Visualization Techniques and Libraries

**** Machine Learning Model ****

We used 5 machine learning model for prediction:

1. Linear Regression
2. AdaBoost
3. Random Forest
4. MLP Regression
5. SVM

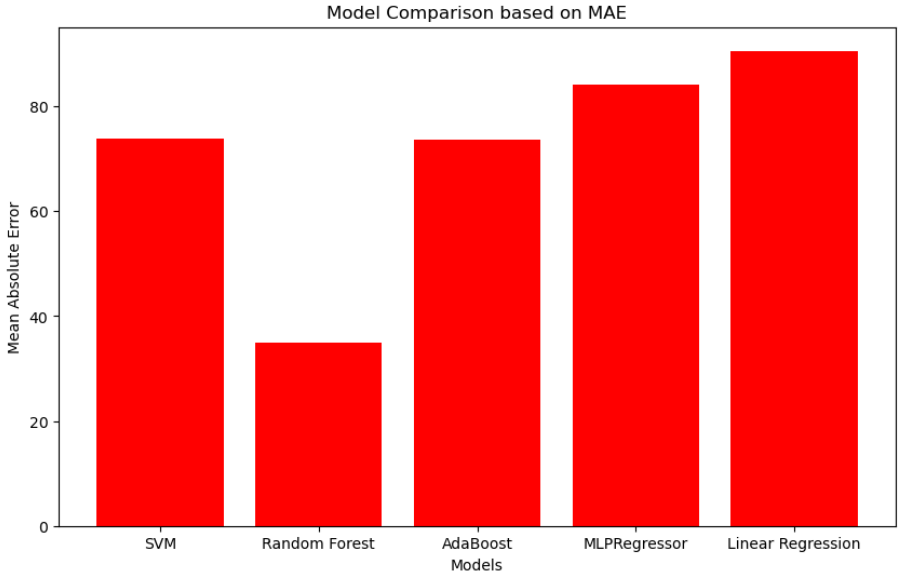
Choosing Machine Learning Model

Choose

As you can see that one realtion is not enough to predict the Price. So, we have to use Multivarible Model

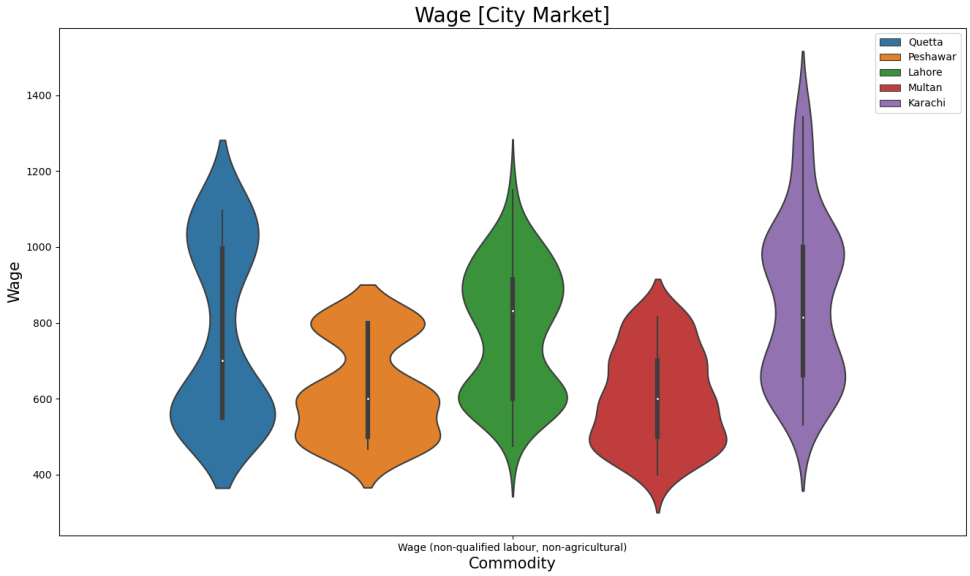
```
|:
from sklearn import svm
from sklearn.neural_network import MLPRegressor
from sklearn.ensemble import RandomForestRegressor
from sklearn.ensemble import AdaBoostRegressor
from sklearn.tree import DecisionTreeRegressor

from sklearn.model_selection import train_test_split
from sklearn.preprocessing import LabelEncoder
from sklearn.metrics import mean_squared_error
from sklearn.metrics import mean_absolute_error
from sklearn.metrics import r2_score
from sklearn.metrics import explained_variance_score
```

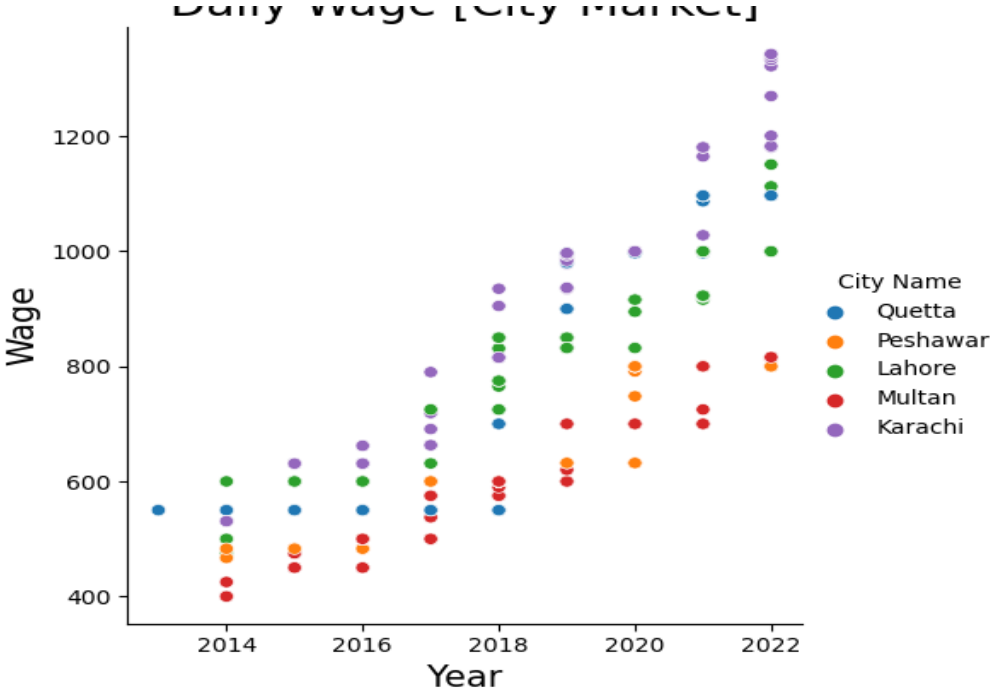
Different Models Accuracy

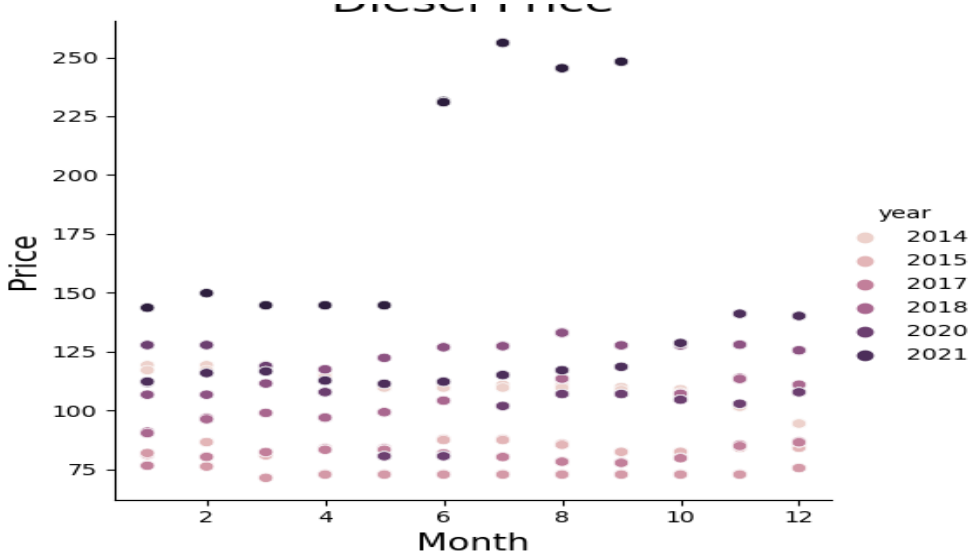


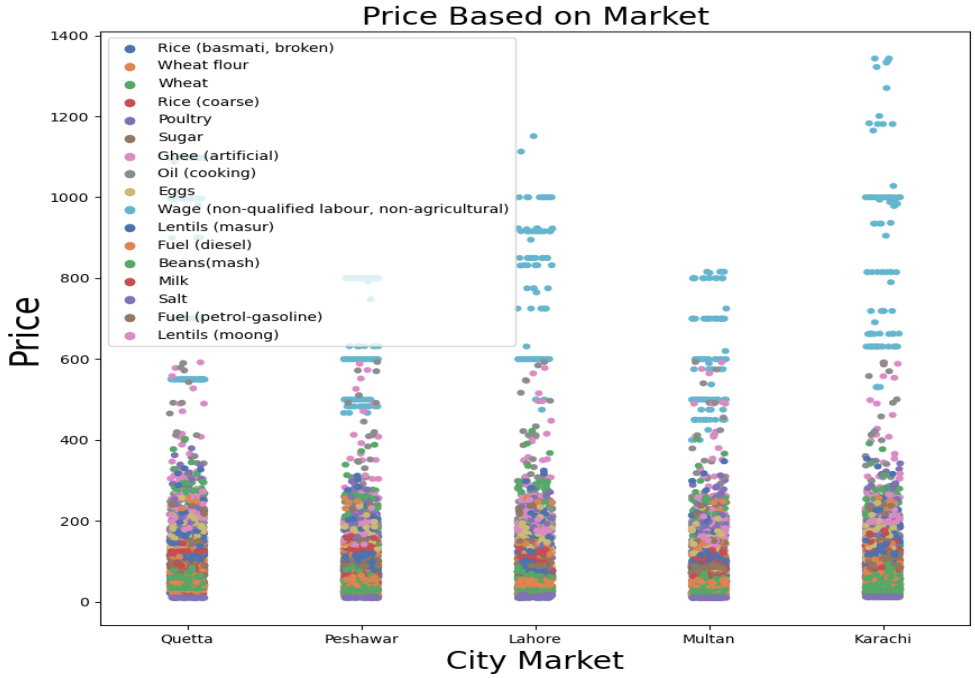
These are some Data Visualization:

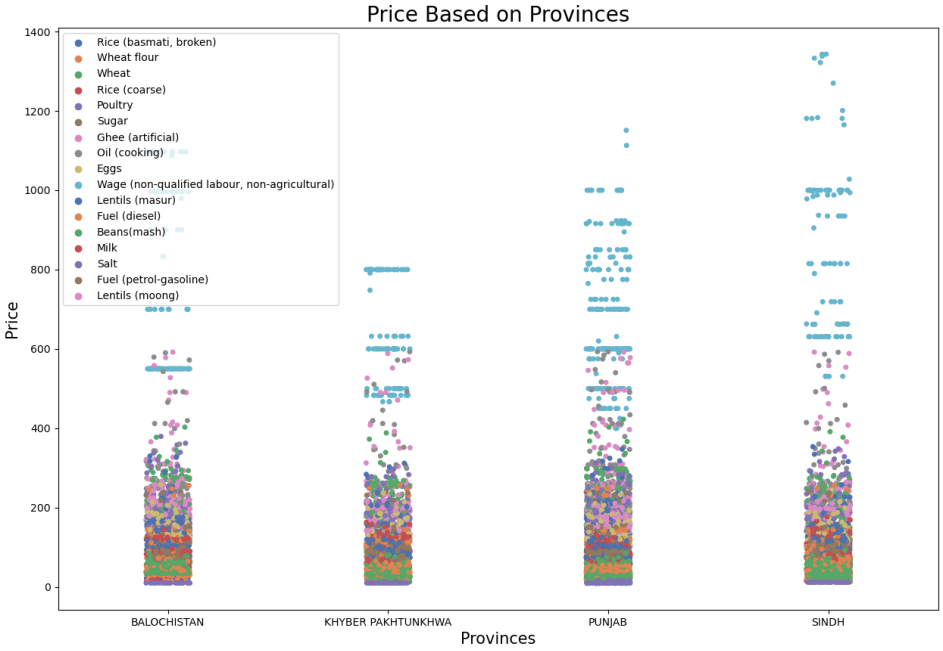
Here are some Data Analysis based on Different PaComparisions.

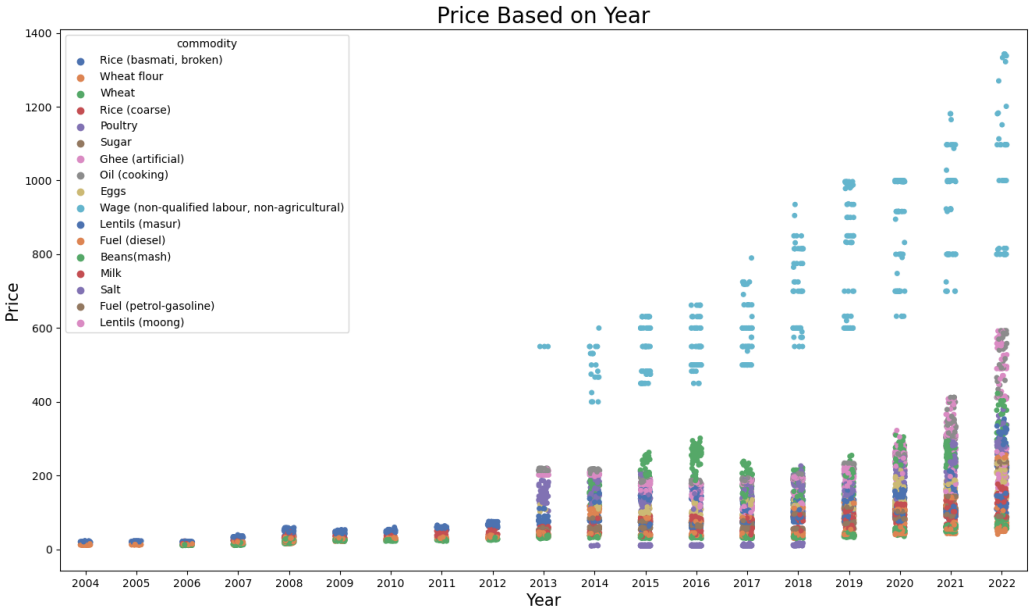


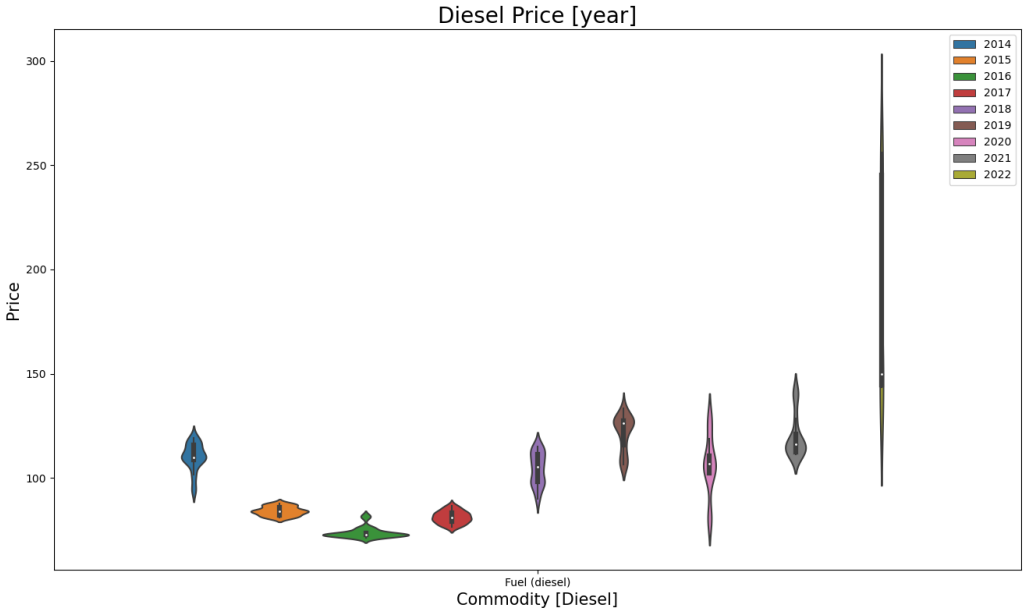


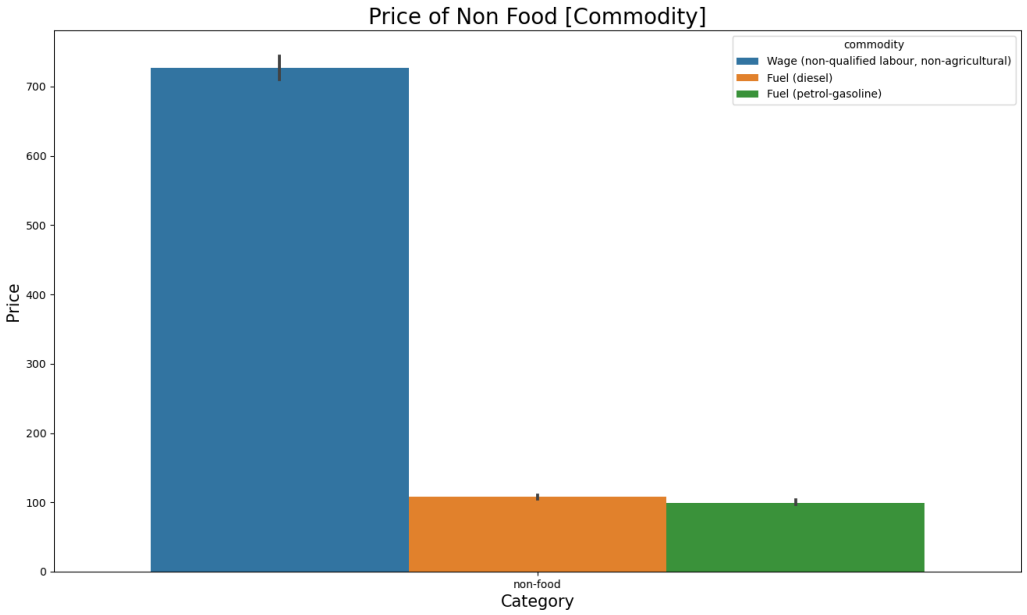

Price
250
225
200
175
150
125
100
75
2
4
6
8
10
12
Month
year
2014
2015
2017
2018
2020
2021

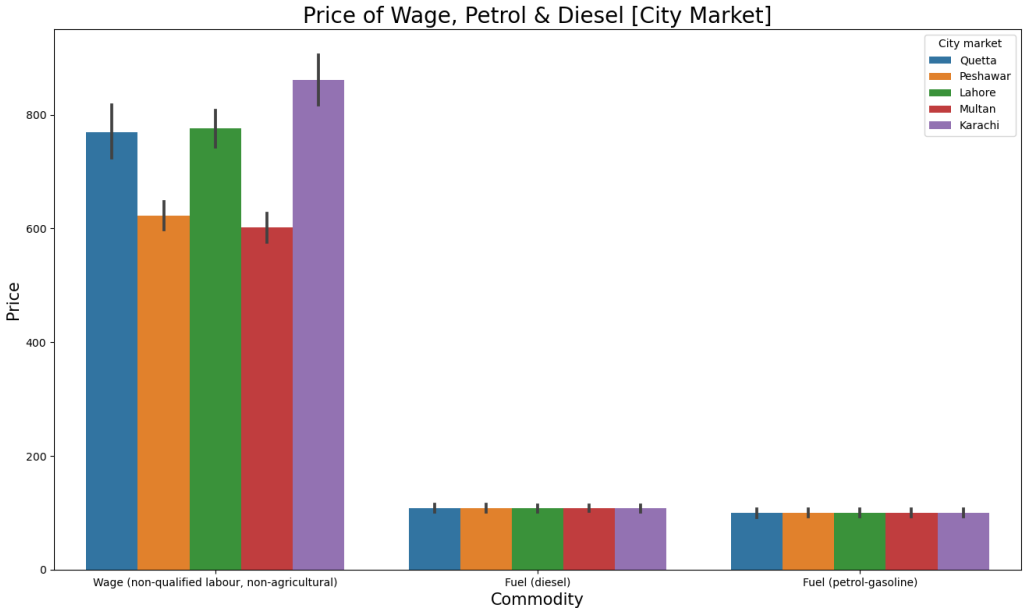

Price Based on Market
Price
1400
1200
1000
800
600
400
200
0
Rice (basmati, broken)
Wheat flour
Wheat
Rice (coarse)
Poultry
Sugar
Ghee (artificial)
Oil (cooking)
Eggs
Wage (non-qualified labour, non-agricultural)
Lentils (masur)
Fuel (diesel)
Beans(mash)
Milk
Salt
Fuel (petrol-gasoline)
Lentils (moong)
Quetta
Peshawar
Lahore
Multan
Karachi
City Market

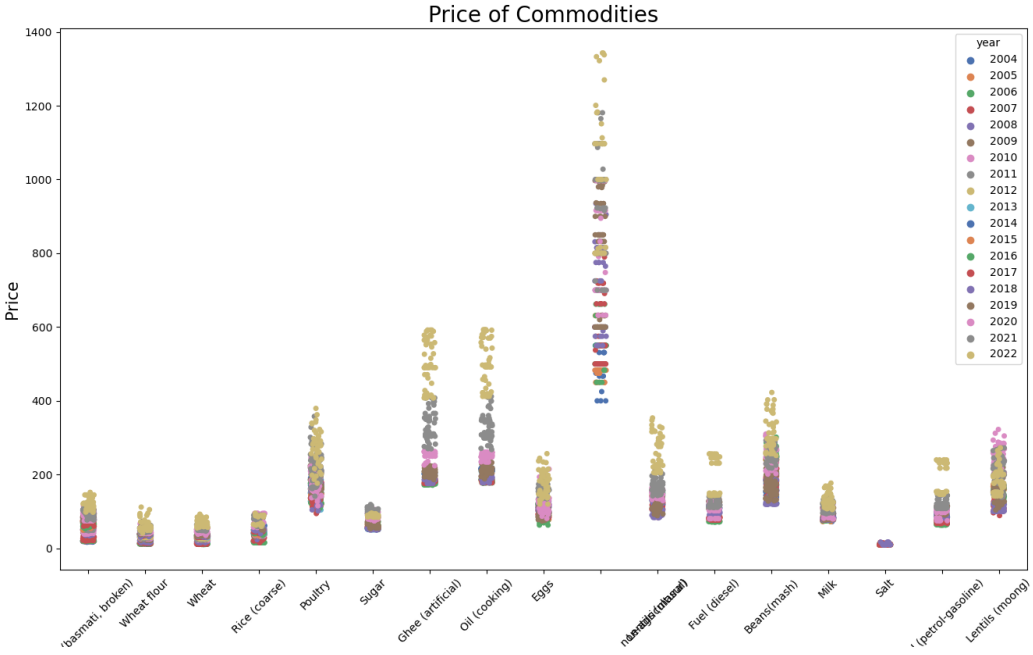

Price Based on Provinces
Rice (basmati, broken)
Wheat flour
Wheat
Rice (coarse)
Poultry
Sugar
Ghee (artificial)
Oil (cooking)
Eggs
Wage (non-qualified labour, non-agricultural)
Lentils (masur)
Fuel (diesel)
Beans(mash)
Milk
Salt
Fuel (petrol-gasoline)
Lentils (moong)
Price
0
200
400
600
800
1000
1200
1400
BALOCHISTAN
KHYBER PAKHTUNKHWA
PUNJAB
SINDH
Provinces

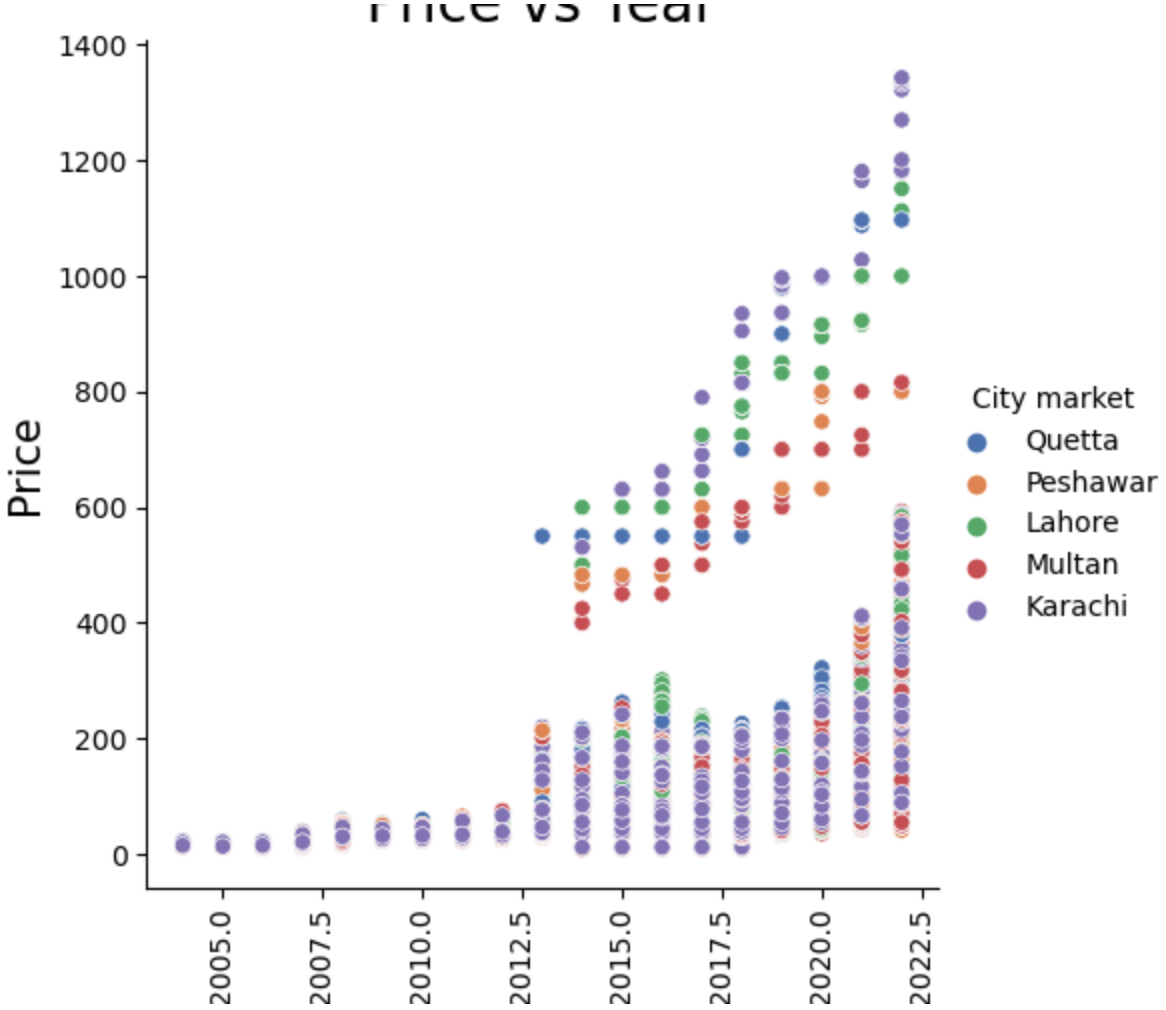

Price Based on Year
commodity
Rice (basmati, broken)
Wheat flour
Wheat
Rice (coarse)
Poultry
Sugar
Ghee (artificial)
Oil (cooking)
Eggs
Wage (non-qualified labour, non-agricultural)
Lentils (masur)
Fuel (diesel)
Beans(mash)
Milk
Salt
Fuel (petrol-gasoline)
Lentils (moong)
Price
0
200
400
600
800
1000
1200
1400
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
Year

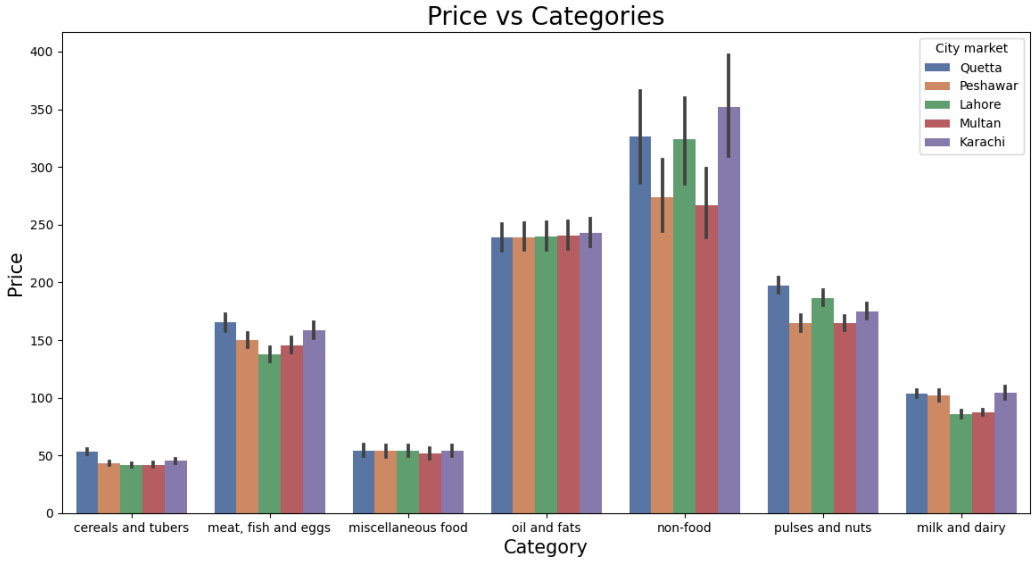

Diesel Price [year]
2014
2015
2016
2017
2018
2019
2020
2021
2022
300
250
200
150
100
Price
Fuel (diesel)
Commodity [Diesel]

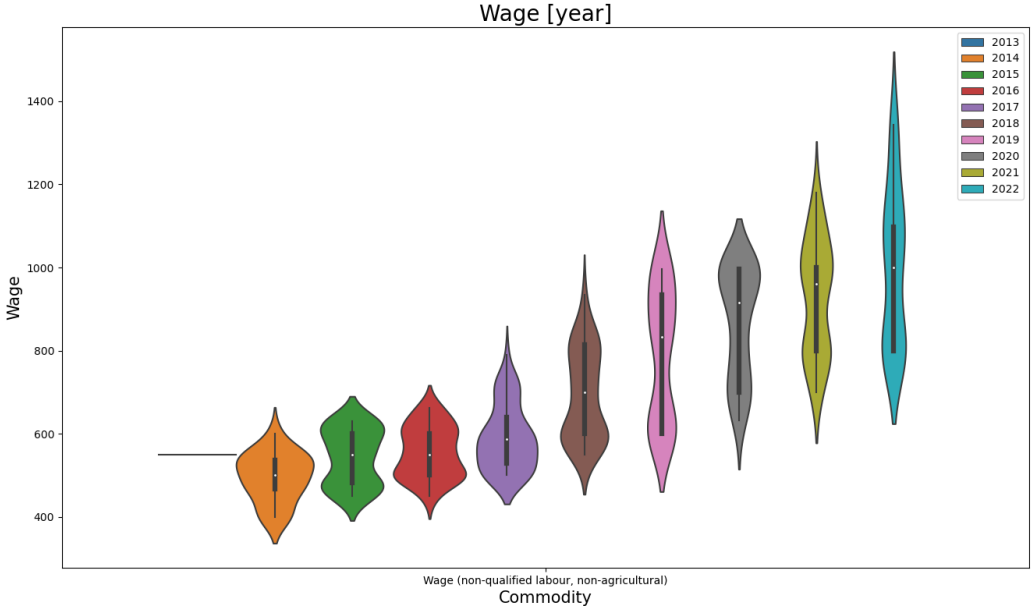

Price of Non Food [Commodity]
commodity
Wage (non-qualified labour, non-agricultural)
Fuel (diesel)
Fuel (petrol-gasoline)
700
600
500
400
300
200
100
0
Price
non-food
Category


Price of Wage, Petrol & Diesel [City Market]
City market
Quetta
Peshawar
Lahore
Multan
Karachi
Price
0
200
400
600
800
Wage (non-qualified labour, non-agricultural)
Fuel (diesel)
Fuel (petrol-gasoline)
Commodity


Price of Commodities
year
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
Price
0
200
400
600
800
1000
1200
1400
Wheat flour
Wheat
Rice (coarse)
Poultry
Sugar
Ghee (artificial)
Oil (cooking)
Eggs
Fuel (diesel)
Beans(mash)
Milk
Salt
Lentils (moong)


Price
1400
1200
1000
800
600
400
200
0
2005.0
2007.5
2010.0
2012.5
2015.0
2017.5
2020.0
2022.5
City market
Quetta
Peshawar
Lahore
Multan
Karachi


Price vs Categories
Price
Category
City market
Quetta
Peshawar
Lahore
Multan
Karachi
cereals and tubers
meat, fish and eggs
miscellaneous food
oil and fats
non-food
pulses and nuts
milk and dairy


Wage [year]
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
1400
1200
1000
800
600
400
Wage
Wage (non-qualified labour, non-agricultural)
Commodity