Date	7 November 2022
Team ID	PNT2022TMIDO1544
Project Name	PROJECT-CAR RESALES VALUE PREDICTION
Maximum Marks	2 Marks

Collect dataset:

Machine Learning has become a tool used in almost every task that requires estimation. So we need to build a model to estimate the price of used cars. The model should take car-related parameters and output a selling price. On sprint-1 the selling price of a used car depends on certain features datasets are collected from different open sources like kaggle.com, data.gov, UCI machine learning repository, the dataset which contains a set of features through which the resale price of the car can be identified is to be collected as

- seller
- offerType
- price
- vehicleType
- yearOfRegistration
- gearbox
- powerPS
- model
- kilometer
- monthOfRegistration
- fuelType
- brand
- notRepairedDamage

ML is a data hunger technology, it depends heavily on data, without data, it is impossible. It is the most crucial aspect that makes algorithm training possible. Collects Data, Import necessary packages, Pre-process images, and passes on to Network Model and Saves Model Weights. The libraries can be imported,

```
[ ] import pandas as pd
    import numpy as np
    import matplotlib as plt
    from sklearn.preprocessing import LabelEncoder
    import pickle

[ ] df = pd.read_csv("/content/drive/MyDrive/Colab Notebooks/autos.csv")
    df.head()
```

	dateCrawled	name	seller	offerType	price	abtest	vehicleType	yearOfRegistration	gearbox	powerPS	model	kilometer	monthOfRegistration	fuelType	brand	notRepairedDamage	dateCreated	nrOfPictures	postalCode	lastSeen
0	24-03-2016 11:52	Golf_3_1.6	privat	Angebot	480	test	NaN	1993	manuell	0	golf	150000.00	0	benzin	volkswagen	NaN	24-03-2016 00:00	0.00	70435	07-04-2016 03:16
1	24-03-2016 10:58	A5_Sportback_2.7_Tdi	privat	Angebot	18300	test	coupe	2011	manuell	190	NaN	125000.00	5	diesel	audi	ja	24-03-2016 00:00	0.00	66954	07-04-2016 01:46
2	14-03-2016 12:52	Jeep_Grand_Cherokee_"Overland"	privat	Angebot	9800	test	suv	2004	automatik	163	grand	125000.00	8	diesel	jeep	NaN	14-03-2016 00:00	0.00	90480	05-04-2016 12:47
3	17-03-2016 16:54	GOLF_4_1.4__3T?ER	privat	Angebot	1500	test	kleinwagen	2001	manuell	75	golf	150000.00	6	benzin	volkswagen	nein	17-03-2016 00:00	0.00	91074	17-03-2016 17:40
4	31-03-2016 17:25	Skoda_Fabia_1.4_TDI_PD_Classic	privat	Angebot	3600	test	kleinwagen	2008	manuell	69	fabia	90000.00	7	diesel	skoda	nein	31-03-2016 00:00	0.00	60437	06-04-2016 10:17

Pre-Process The Data:

Pre-processing the dataset that includes:

- Handling the null values.
- Handling the categorical values if any.
- Normalize the data if required.
- Identify the dependent and independent variables.

Data cleaning and wrangling methods are applied on the *used cars* data file. Before making data cleaning, some explorations and data visualizations were applied on data set. This gave some idea and guide about how to deal with missing values and extreme values. After data cleaning, data exploration was applied again in order to understand cleaned version of the data.

```
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df.head()
```

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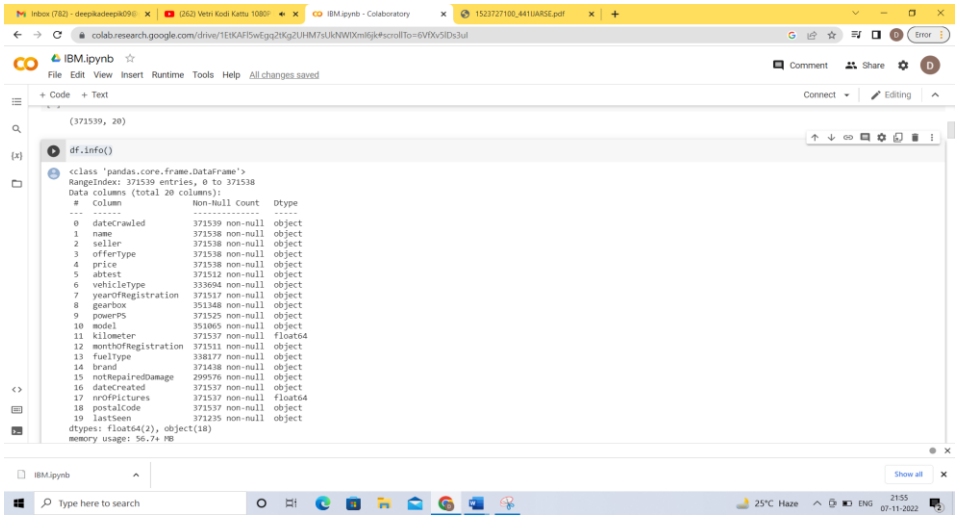
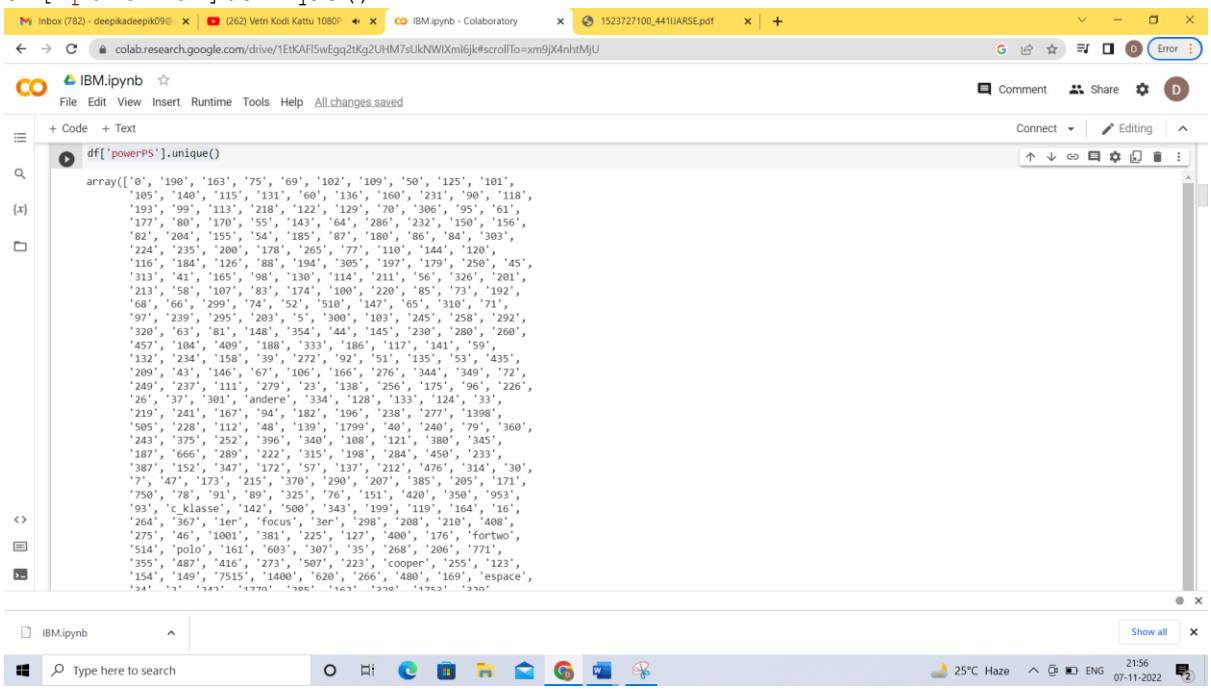
```
print(df.shape)
(371539, 20)
```

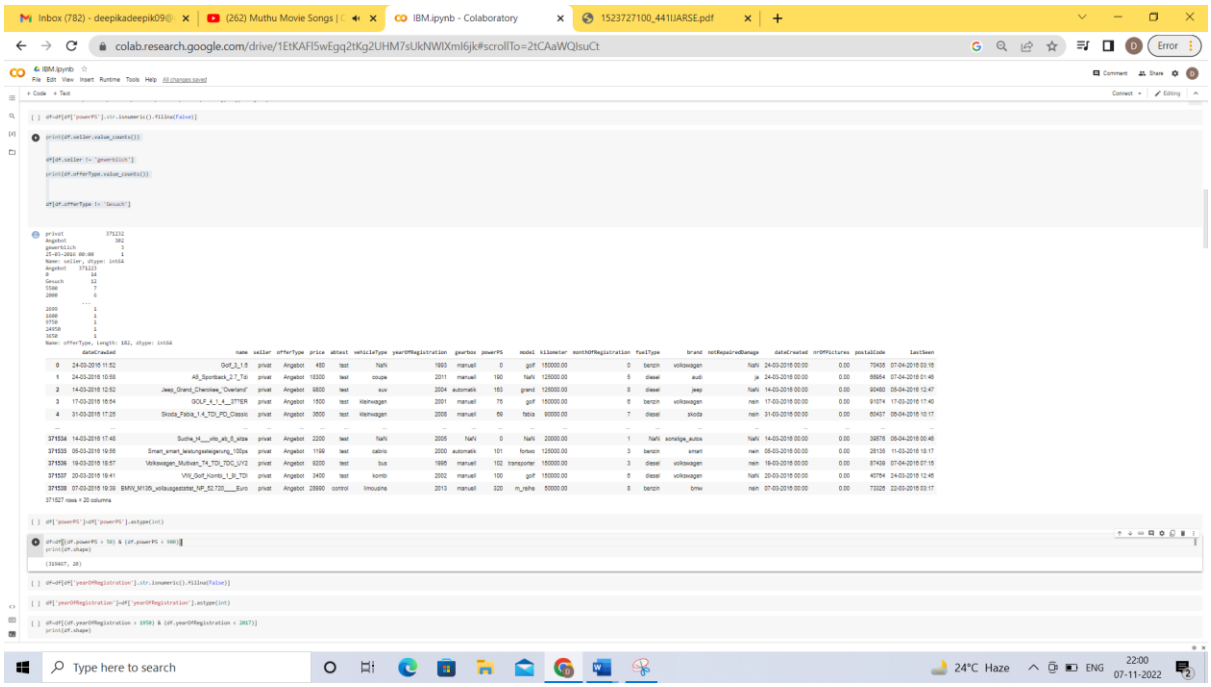
```
df.info()
```



```
df['powerPS'].unique()
```




```
df=df[df['powerPS'].str.isnumeric().fillna(False)]
print(df.seller.value_counts())
df[df.seller != 'gewerblich']
print(df.offerType.value_counts())
df[df.offerType != 'Gesuch']
```



```
df['powerPS']=df['powerPS'].astype(int)
df=df[(df.powerPS > 50) & (df.powerPS < 900)]
print(df.shape)
df=df[df['yearOfRegistration'].str.isnumeric().fillna(False)]
```

```
df['yearOfRegistration']=df['yearOfRegistration'].astype(int)
df=df[(df.yearOfRegistration > 1950) & (df.yearOfRegistration < 2017)]
print(df.shape)
df.drop(['name', 'abtest', 'dateCrawled', 'nrOfPictures', 'lastSeen', '
postalCode', 'dateCreated'], axis='columns', inplace=True)
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 308923 entries, 1 to 371538
Data columns (total 13 columns):
 #   Column               Non-Null Count   Dtype
---  ------               --------------   -----
 0   seller               308923 non-null  object
 1   offerType            308923 non-null  object
 2   price                308923 non-null  object
 3   vehicleType          297510 non-null  object
 4   yearOfRegistration   308923 non-null  int64
 5   gearbox              303629 non-null  object
 6   powerPS              308923 non-null  int64
 7   model                297134 non-null  object
 8   kilometer            308923 non-null  float64
 9   monthOfRegistration  308923 non-null  object
 10  fuelType             293046 non-null  object
 11  brand                308923 non-null  object
 12  notRepairedDamage    265507 non-null  object
dtypes: float64(1), int64(2), object(10)
memory usage: 33.0+ MB
```

```
new_df=df.copy()
new_df = new_df.drop_duplicates(['price', 'vehicleType', 'yearOfRegistr
ation',
'gearbox', 'powerPS', 'model', 'kilometer', 'monthOfRegistration', 'fue
lType',
'notRepairedDamage'])
new_df.gearbox.replace(('manuell', 'automatik'), ('manual', 'automatic'
), inplace=True)
new_df.fuelType.replace(('benzin', 'andere', 'elektro'), ('petrol', 'ot
hers', 'electric'), inplace=True)
new_df.notRepairedDamage.replace(('ja', 'nein'),('Yes', 'No'), inplace=
True)
new_df.vehicleType.replace(('kleinwagen', 'cabrio', 'kombi', 'andere'),
 ('small car','convertible', 'combination', 'others'), inplace=True)
```

```
new_df['price'].unique()
```

```
new_df['price'].unique()
```

```
array(['18300', '9800', '1500', ..., '18429', '24895', '10985'],
      dtype=object)
```

```
new_df['price']=new_df['price'].astype(int)
new_df = new_df[(new_df.price >= 100) & (new_df.price <= 150000)]
new_df['fuelType'].fillna (value='not-declared', inplace=True)
new_df['gearbox'].fillna (value='not-declared', inplace=True)

new_df['notRepairedDamage'].fillna (value='not-declared', inplace=True)

new_df[ 'vehicleType'].fillna (value='not-declared', inplace=True)
new_df['model'].fillna (value='not-declared', inplace=True)
new_df['kilometer']=new_df['kilometer'].astype(int)
new_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 278363 entries, 1 to 371538
Data columns (total 13 columns):
 #   Column               Non-Null Count   Dtype
---  ------               --------------   -----
 0   seller               278363 non-null  object
 1   offerType            278363 non-null  object
 2   price                278363 non-null  int64
 3   vehicleType          278363 non-null  object
 4   yearOfRegistration   278363 non-null  int64
 5   gearbox              278363 non-null  object
 6   powerPS              278363 non-null  int64
 7   model                278363 non-null  object
 8   kilometer            278363 non-null  int64
 9   monthOfRegistration  278363 non-null  object
 10  fuelType             278363 non-null  object
 11  brand                278363 non-null  object
 12  notRepairedDamage    278363 non-null  object
dtypes: int64(4), object(9)
memory usage: 29.7+ MB
```

```
new_df.head()
```

```
new_df.head()
```

	seller	offerType	price	vehicleType	yearOfRegistration	gearbox	powerPS	model	kilometer	monthOfRegistration	fuelType	brand	notRepairedDamage
1	privat	Angebot	18300	coupe	2011	manual	190	not-declared	125000	5	diesel	audi	Yes
2	privat	Angebot	9800	suv	2004	automatic	163	grand	125000	8	diesel	jeep	not-declared
3	privat	Angebot	1500	small car	2001	manual	75	golf	150000	6	petrol	volkswagen	No
4	privat	Angebot	3600	small car	2008	manual	69	fabia	90000	7	diesel	skoda	No
5	privat	Angebot	650	limousine	1995	manual	102	3er	150000	10	petrol	bmw	Yes