REPORT

1.SELF INTRO:

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- ► **Specialization : Computer Science and Engineering**
- ► **Year : 2023**

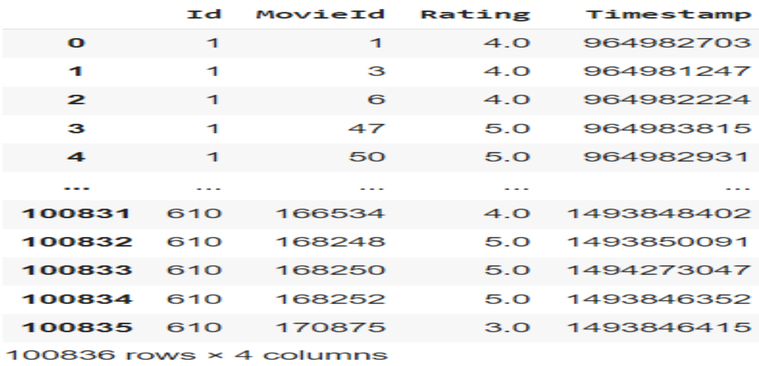
2.My AI/ML model - Python code with comments:

1.MAJOR PROJECT 1

► Choose any dataset of your choice and apply a suitable CLASSIFIER/REGRESSOR and if possible deploy it on Heroku.

DATASET LINK - https://www.kaggle.com/datasets/ammaraahmad/top-10-machine-learning-datasets?select=ratings.csv

```
#1.Take a dataset and create dataframe
import pandas as pd
df = pd.read_csv('/content/ratings.csv')
df
```



	Id	MovieId	Rating	Timestamp
0	1	1	4.0	964982703
1	1	3	4.0	964981247
2	1	6	4.0	964982224
3	1	47	5.0	964983815
4	1	50	5.0	964982931
...	...	...	...	...
100831	610	166534	4.0	1493848402
100832	610	168248	5.0	1493850091
100833	610	168250	5.0	1494273047
100834	610	168252	5.0	1493846352
100835	610	170875	3.0	1493846415

100836 rows × 4 columns

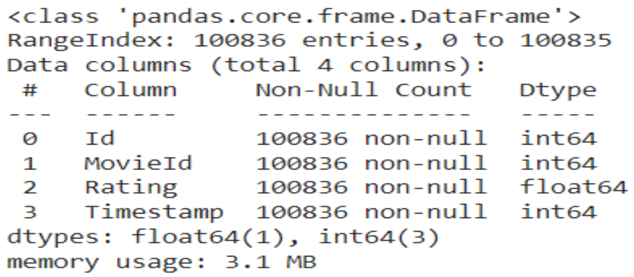
```
df. shape #It represents the dataset contain how many rows and columns
```

```
(100836, 4)
```

```
df.size #It represents total no.of elements present in dataset
```

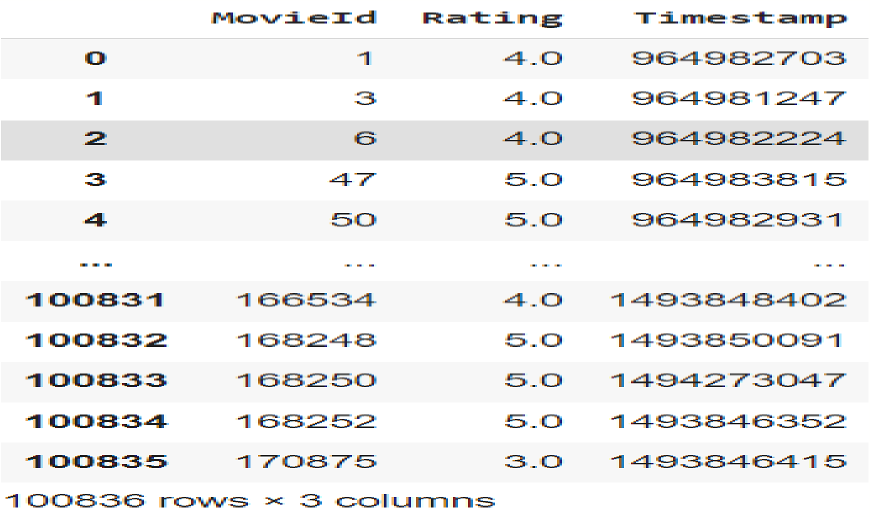
```
403344
```

```
df.info()#It prints information about the Data Frame
```



```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 100836 entries, 0 to 100835
Data columns (total 4 columns):
 #   Column     Non-Null Count   Dtype  
---  ------     --------------   -----  
 0   Id         100836 non-null  int64  
 1   MovieId    100836 non-null  int64  
 2   Rating     100836 non-null  float64
 3   Timestamp  100836 non-null  int64  
dtypes: float64(1), int64(3)
memory usage: 3.1 MB
```

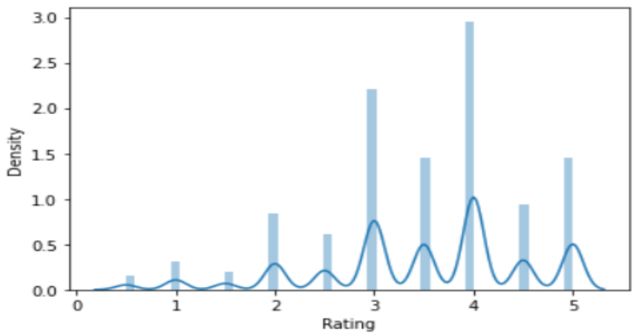
```
#2. PREPROCESSING - FILTERING OF DATA
#To remove/drop the Id column
df = df.drop(columns = 'Id')
df
```



	MovieId	Rating	Timestamp
0	1	4.0	964982703
1	3	4.0	964981247
2	6	4.0	964982224
3	47	5.0	964983815
4	50	5.0	964982931
...	...	...	...
100831	166534	4.0	1493848402
100832	168248	5.0	1493850091
100833	168250	5.0	1494273047
100834	168252	5.0	1493846352
100835	170875	3.0	1493846415

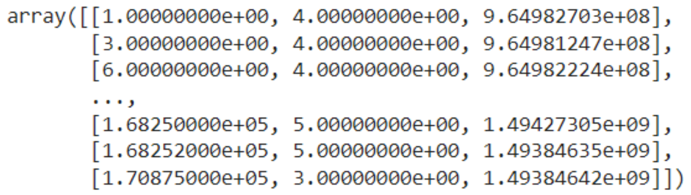
100836 rows × 3 columns

```
#3.VISUALIZATION
import seaborn as sns
sns.distplot(df['Rating']) # distribution plot
```



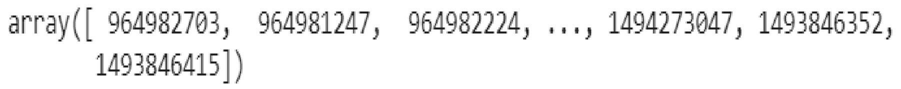
```
#4.divide the data into i/p and o/p
#output - Timestamp
#input - All the columns except the Timestamp column
x = df.iloc[:,0:3].values
```

```
x
```



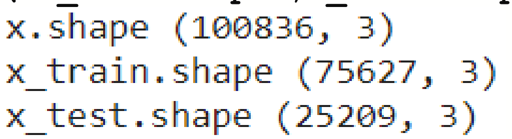
```
array([[1.00000000e+00, 4.00000000e+00, 9.64982703e+08],
       [3.00000000e+00, 4.00000000e+00, 9.64981247e+08],
       [6.00000000e+00, 4.00000000e+00, 9.64982224e+08],
       ...,
       [1.68250000e+05, 5.00000000e+00, 1.49427305e+09],
       [1.68252000e+05, 5.00000000e+00, 1.49384635e+09],
       [1.70875000e+05, 3.00000000e+00, 1.49384642e+09]])
```

```
y = df.iloc[:,2].values
y
```



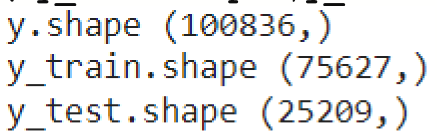
```
array([ 964982703,  964981247,  964982224, ..., 1494273047, 1493846352,
       1493846415])
```

```
#5.TRAIN and TEST VARIABLES
#sklearn.model_selection - package , train_test_split - library

from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(x,y,random_state= 0)

#Whatever data splitting /data allocation happens to the
xtrain,x_test,ytrain,ytest variables , we want those allocated values
to remain constant.By default the training variables get 75 % and
testing variables get 25%
print("x.shape",x.shape) # 100836 rows and 3 cols
print("x_train.shape",x_train.shape) # 75627 rows and 3 cols (75%)
print("x_test.shape",x_test.shape) # 25209 rows and 3 cols (25%)
```



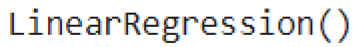
```
x.shape (100836, 3)
x_train.shape (75627, 3)
x_test.shape (25209, 3)
```

```
print("y.shape",y.shape) # 100836 rows and 1 col
print("y_train.shape",y_train.shape) # 75627 rows and 1 col (75%)
print("y_test.shape",y_test.shape) # 25209 rows and 1 col (25%)
```



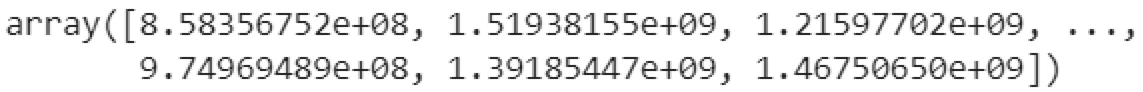
```
y.shape (100836,)
y_train.shape (75627,)
y_test.shape (25209,)
```

```
#6.SCALING or NORMALISATION -DONE ONLY FOR INPUTS
   from sklearn.preprocessing import MinMaxScaler
   scaler = MinMaxScaler()
   x_train = scaler.fit_transform(x_train)
   x_test = scaler.fit_transform(x_test)

#7.RUN a CLASSIFIER/REGRESSOR/CLUSTERER
    from sklearn.linear_model import LinearRegression
    model = LinearRegression()

#8.MODEL FITTING
    model.fit(x_train,y_train)
```



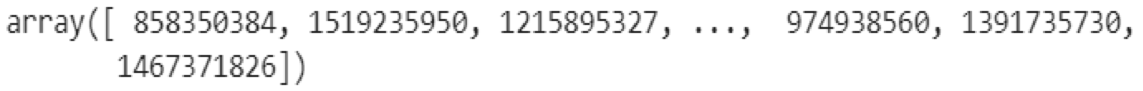
```
LinearRegression()
```

```
#9.PREDICT THE OUTPUT
     y_pred = model.predict(x_test)
     #By taking the input testing data ,we predict the output
     y_pred #PREDICTED VALUES
```



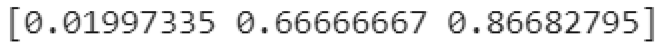
```
array([8.58356752e+08, 1.51938155e+09, 1.21597702e+09, ...,
       9.74969489e+08, 1.39185447e+09, 1.46750650e+09])
```

```
     y_test #ACTUAL VALUES
```



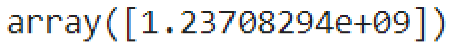
```
array([ 858350384, 1519235950, 1215895327, ...,  974938560, 1391735730,
       1467371826])
```

```
     print(x_train[25]) #these are scaled/normalised values
```



```
[0.01997335 0.66666667 0.86682795]
```

```
 #INDIVIDUAL PREDICTION
     model.predict([x_train[10]])
```



```
array([1.23708294e+09])
```

MAJOR PROJECT 2

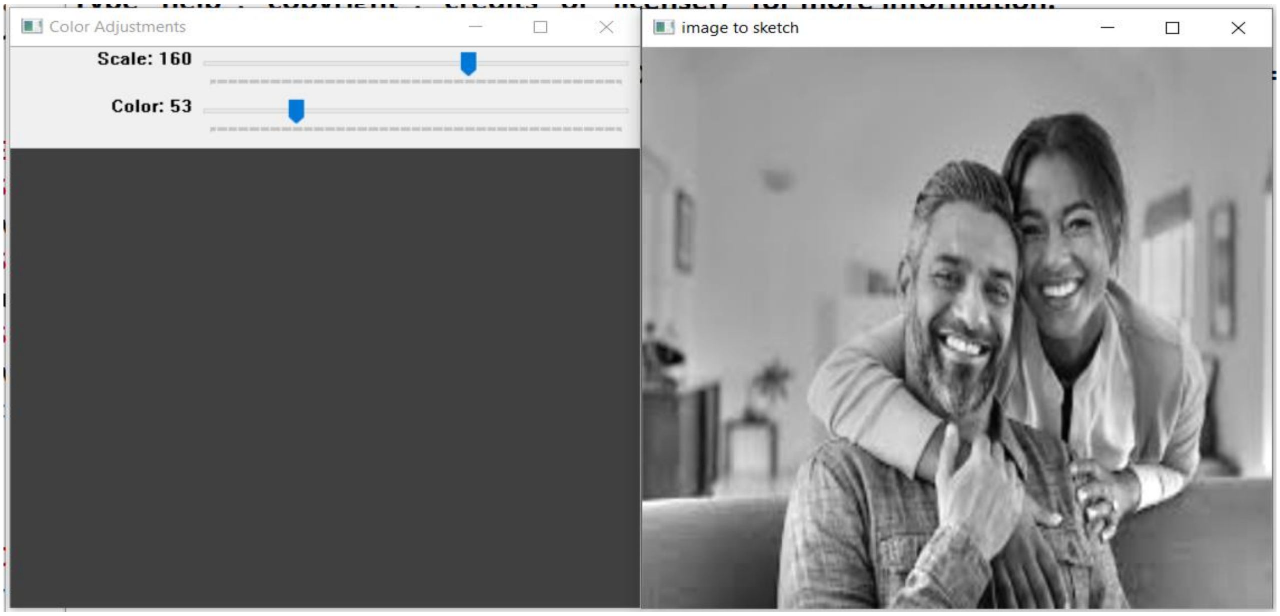
- ► Create any of the Image Processing Projects using Numpy and OpenCV.

NAME OF THE PROJECT: Image to sketch

Code:

```
#Step - 1 - Load Libraries and Image
#Step - 2 - Converte Image into Gray Scale
#Step - 3 - Inveted Gary Scale Image [For Shifting toward selected channel]
#Step - 4 - Apply Image Smooting For Shading effect
#Step - 5 - Invert Blur Image and Apply division between gray and invert_blur.
#-----------------------------------------------------------------------------------------------------------------
#Step-1-Importing numpy and cv2 packages
import numpy as np
import cv2

#Read Image------------------
#imread( ) is used to read the image for the given  directory
img = cv2.imread('image to sketch.jpg')
#resize( ) is used to change the image size
img = cv2.resize(img,(450,450))

#Create Trackbar----

def nothing(x):#Define a function which can be used as call back function for the trackbar
   pass

#namedWindow( ) takes two arguments-1.window_name:Used to name window that displayed,2.flag:Represents if window size is automatically set or adjustable
cv2.namedWindow("Color Adjustments",cv2.WINDOW_NORMAL)

#It takes 3 arguments-1.window_name, 2.width, 3.height
cv2.resizeWindow("Color Adjustments", (450, 450))

#createTrackbar()-Used to read the current poisition of the trackbar slider
cv2.createTrackbar("Scale", "Color Adjustments", 0, 255, nothing)
cv2.createTrackbar("Color", "Color Adjustments", 0, 255, nothing)

#Step -2
#Convert into gray--
gray = cv2.cvtColor(img,cv2.COLOR_BGR2GRAY)
while True:
   scale =  cv2.getTrackbarPos("Scale", "Color Adjustments")
   clr = cv2.getTrackbarPos("Color", "Color Adjustments") #getting track bar value
```

```
    #Extracting Color Code --
    #Step - 3
    inverted_gray =  clr - gray  #inverted color image
    #Step -4
    blur_img = cv2.GaussianBlur(inverted_gray,(255,255),0) #Used to smoothing the input image
    #Step -5
    inverted_blur = clr - blur_img  #inverted blured image
    fltr = cv2.divide(gray,inverted_blur,scale = scale)



    #Output----------------------
    cv2.imshow("image to sketch",fltr) #show the image to sketch image
    k = cv2.waitKey(1)
    #use waitkey to add delay and stop the function when the user presses esc key
    if k == ord("q"):
        break
    if k == ord("s"):
       cv2.imwrite("image to sketch.jpg",fltr) #Used to save an image to any storage device

cv2.destroyAllWindows() #destroy all widows after exiting the while loop
```



Scale: 160

Color: 53

Github Account Link: https://github.com/yegnajayasimha21