Rinex-Education Research Center

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CLASSIFIER / REGRESSION
SMILE DETECTION

Mini Project report submitted in partial fulfillment of the requirement for the course of

DATA SCIENCE

Submitted By

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BRANCH	**Information Science & Engineering**
YEAR	**4th-year**

Under Guidance

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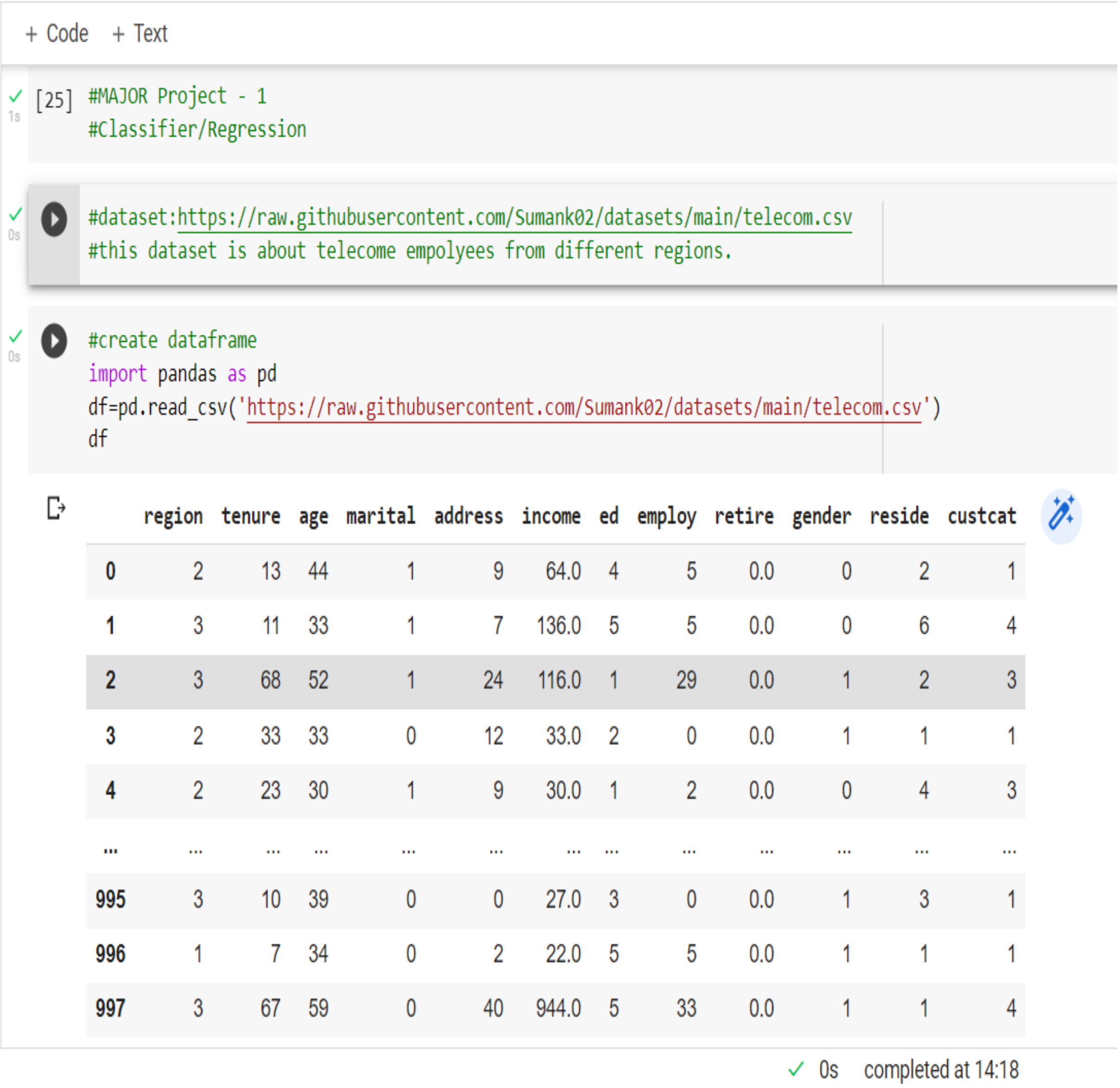
November-2022

Classifier / Regression

Source Code with Snapshots



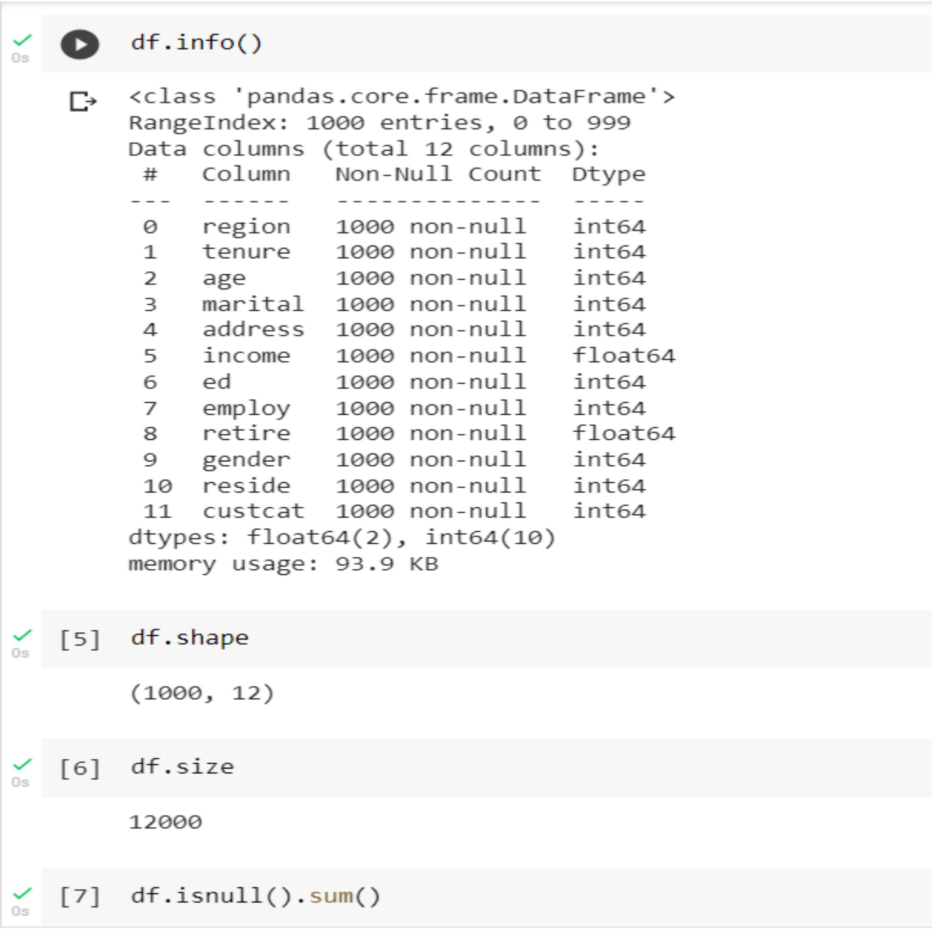
```
#MAJOR Project - 1
#Classifier/Regression
```

```
#dataset:https://raw.githubusercontent.com/Sumank02/datasets/main/telecom.csv
#this dataset is about telecome empolyees from different regions.
```

```
#create dataframe
import pandas as pd
df=pd.read_csv('https://raw.githubusercontent.com/Sumank02/datasets/main/telecom.csv')
df
```

	region	tenure	age	marital	address	income	ed	employ	retire	gender	reside	custcat
0	2	13	44	1	9	64.0	4	5	0.0	0	2	1
1	3	11	33	1	7	136.0	5	5	0.0	0	6	4
2	3	68	52	1	24	116.0	1	29	0.0	1	2	3
3	2	33	33	0	12	33.0	2	0	0.0	1	1	1
4	2	23	30	1	9	30.0	1	2	0.0	0	4	3
...	...	...	...	...	...	...	...	...	...	...	...	...
995	3	10	39	0	0	27.0	3	0	0.0	1	3	1
996	1	7	34	0	2	22.0	5	5	0.0	1	1	1
997	3	67	59	0	40	944.0	5	33	0.0	1	1	4

✓ 0s completed at 14:18



```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1000 entries, 0 to 999
Data columns (total 12 columns):
 #   Column    Non-Null Count  Dtype  
---  ------    --------------  -----  
 0   region    1000 non-null   int64  
 1   tenure    1000 non-null   int64  
 2   age       1000 non-null   int64  
 3   marital   1000 non-null   int64  
 4   address   1000 non-null   int64  
 5   income    1000 non-null   float64
 6   ed        1000 non-null   int64  
 7   employ    1000 non-null   int64  
 8   retire    1000 non-null   float64
 9   gender    1000 non-null   int64  
 10  reside    1000 non-null   int64  
 11  custcat   1000 non-null   int64  
dtypes: float64(2), int64(10)
memory usage: 93.9 KB
```

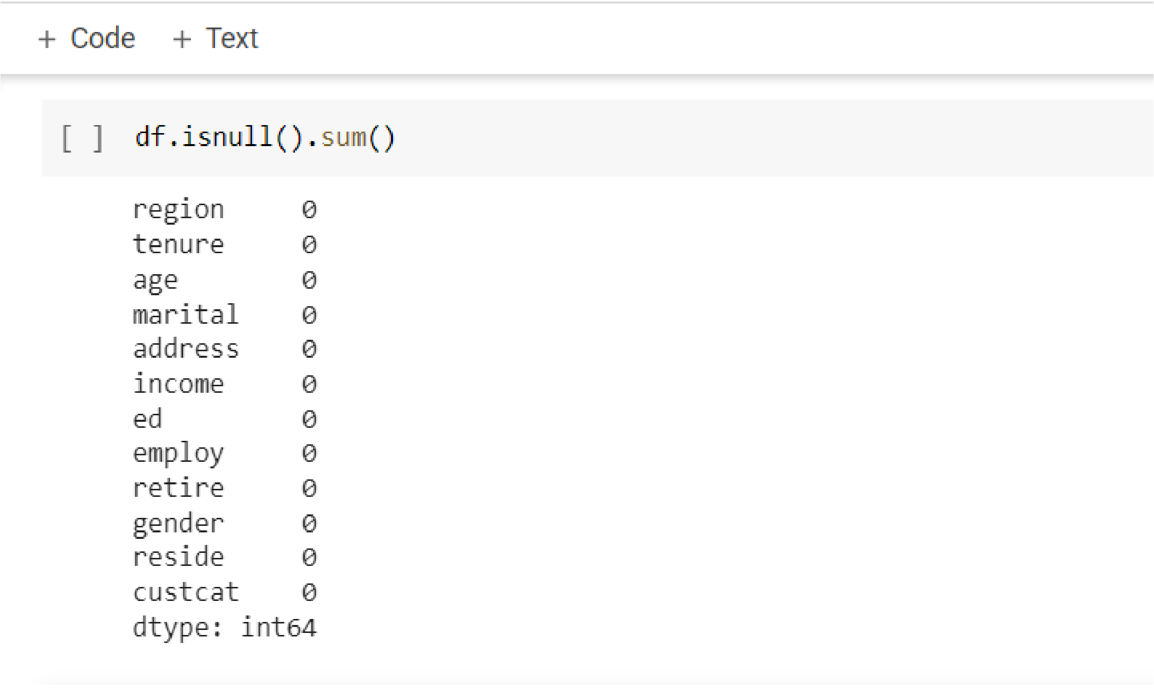
```
[5]  df.shape
```

```
(1000, 12)
```

```
[6]  df.size
```

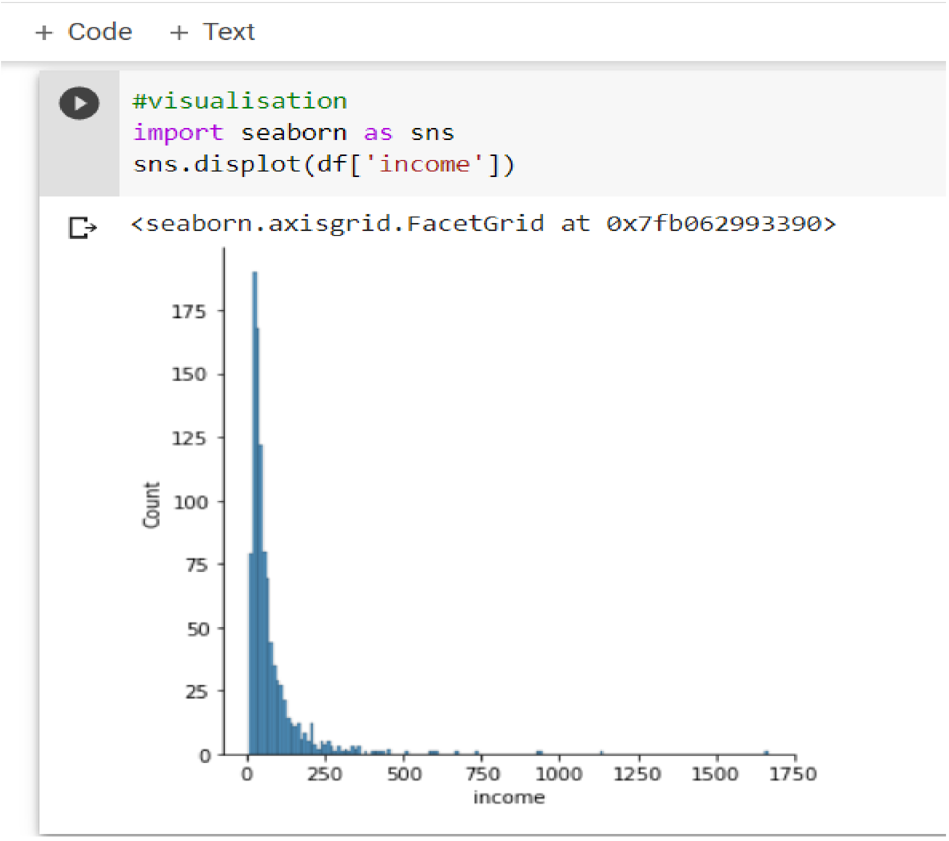
```
12000
```

```
[7]  df.isnull().sum()
```



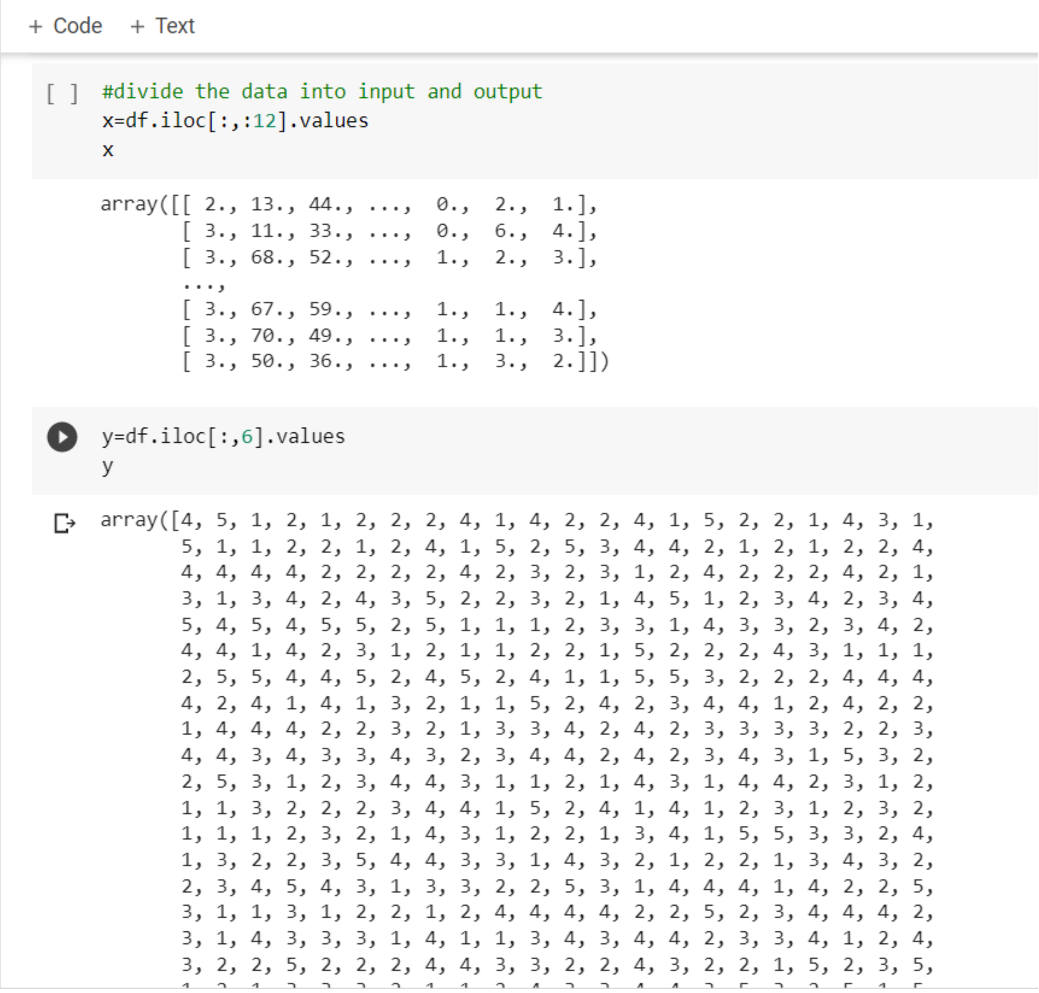
```
[ ]  df.isnull().sum()
```

```
region     0
tenure     0
age        0
marital    0
address    0
income     0
ed         0
employ     0
retire     0
gender     0
reside     0
custcat    0
dtype: int64
```



```
#visualisation
import seaborn as sns
sns.displot(df['income'])
```

```
<seaborn.axisgrid.FacetGrid at 0x7fb062993390>
```

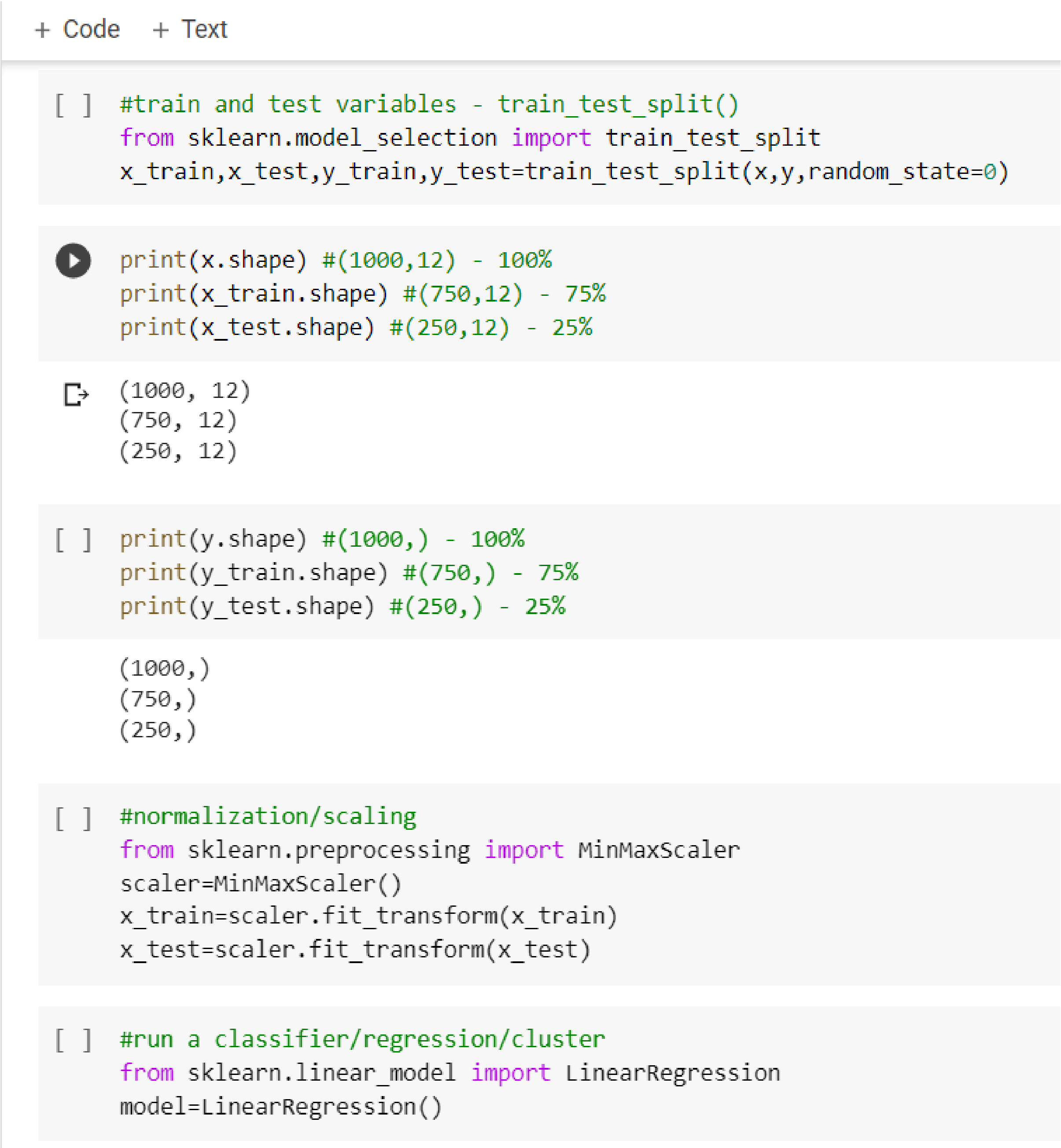


```
#divide the data into input and output
x=df.iloc[:,:12].values
x
```

```
array([[ 2., 13., 44., ...,  0.,  2.,  1.],
       [ 3., 11., 33., ...,  0.,  6.,  4.],
       [ 3., 68., 52., ...,  1.,  2.,  3.],
       ...,
       [ 3., 67., 59., ...,  1.,  1.,  4.],
       [ 3., 70., 49., ...,  1.,  1.,  3.],
       [ 3., 50., 36., ...,  1.,  3.,  2.]])
```

```
y=df.iloc[:,6].values
y
```

```
array([4, 5, 1, 2, 1, 2, 2, 2, 4, 1, 4, 2, 2, 4, 1, 5, 2, 2, 1, 4, 3, 1,
       5, 1, 1, 2, 2, 1, 2, 4, 1, 5, 2, 5, 3, 4, 4, 2, 1, 2, 1, 2, 2, 4,
       4, 4, 4, 4, 2, 2, 2, 2, 4, 2, 3, 2, 3, 1, 2, 4, 2, 2, 2, 4, 2, 1,
       3, 1, 3, 4, 2, 4, 3, 5, 2, 2, 3, 2, 1, 4, 5, 1, 2, 3, 4, 2, 3, 4,
       5, 4, 5, 4, 5, 5, 2, 5, 1, 1, 1, 2, 3, 3, 1, 4, 3, 3, 2, 3, 4, 2,
       4, 4, 1, 4, 2, 3, 1, 2, 1, 1, 2, 2, 1, 5, 2, 2, 2, 4, 3, 1, 1, 1,
       2, 5, 5, 4, 4, 5, 2, 4, 5, 2, 4, 1, 1, 5, 5, 3, 2, 2, 2, 4, 4, 4,
       4, 2, 4, 1, 4, 1, 3, 2, 1, 1, 5, 2, 4, 2, 3, 4, 4, 1, 2, 4, 2, 2,
       1, 4, 4, 4, 2, 2, 3, 2, 1, 3, 3, 4, 2, 4, 2, 3, 3, 3, 3, 2, 2, 3,
       4, 4, 3, 4, 3, 3, 4, 3, 2, 3, 4, 4, 2, 4, 2, 3, 4, 3, 1, 5, 3, 2,
       2, 5, 3, 1, 2, 3, 4, 4, 3, 1, 1, 2, 1, 4, 3, 1, 4, 4, 2, 3, 1, 2,
       1, 1, 3, 2, 2, 2, 3, 4, 4, 1, 5, 2, 4, 1, 4, 1, 2, 3, 1, 2, 3, 2,
       1, 1, 1, 2, 3, 2, 1, 4, 3, 1, 2, 2, 1, 3, 4, 1, 5, 5, 3, 3, 2, 4,
       1, 3, 2, 2, 3, 5, 4, 4, 3, 3, 1, 4, 3, 2, 1, 2, 2, 1, 3, 4, 3, 2,
       2, 3, 4, 5, 4, 3, 1, 3, 3, 2, 2, 5, 3, 1, 4, 4, 4, 1, 4, 2, 2, 5,
       3, 1, 1, 3, 1, 2, 2, 1, 2, 4, 4, 4, 4, 2, 2, 5, 2, 3, 4, 4, 4, 2,
       3, 1, 4, 3, 3, 3, 1, 4, 1, 1, 3, 4, 3, 4, 4, 2, 3, 3, 4, 1, 2, 4,
       3, 2, 2, 5, 2, 2, 2, 4, 4, 3, 3, 2, 2, 4, 3, 2, 2, 1, 5, 2, 3, 5,
```



```
#train and test variables - train_test_split()
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(x,y,random_state=0)
```

```
print(x.shape) #(1000,12) - 100%
print(x_train.shape) #(750,12) - 75%
print(x_test.shape) #(250,12) - 25%
```

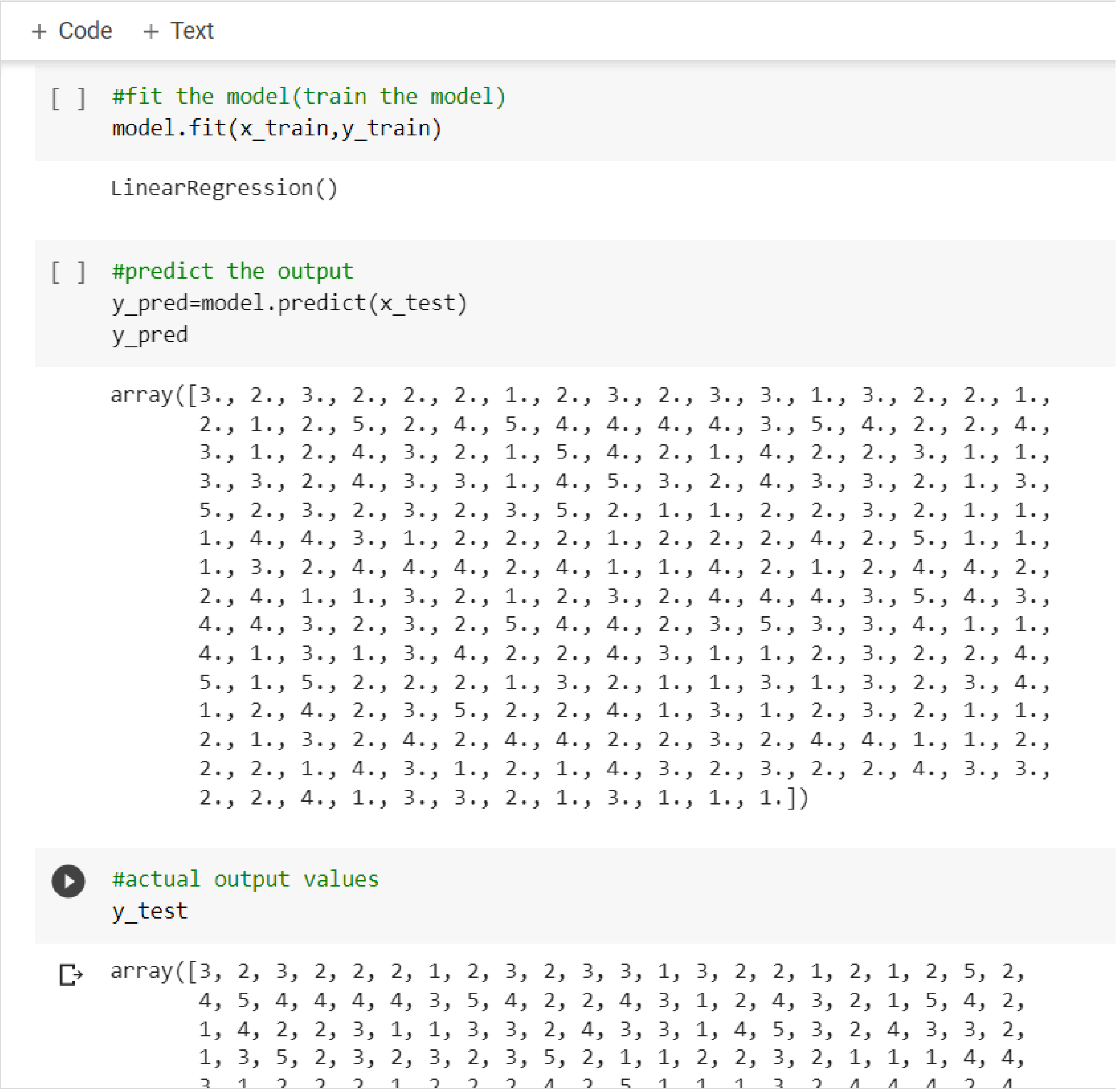
```
(1000, 12)
(750, 12)
(250, 12)
```

```
print(y.shape) #(1000,) - 100%
print(y_train.shape) #(750,) - 75%
print(y_test.shape) #(250,) - 25%
```

```
(1000,)
(750,)
(250,)
```

```
#normalization/scaling
from sklearn.preprocessing import MinMaxScaler
scaler=MinMaxScaler()
x_train=scaler.fit_transform(x_train)
x_test=scaler.fit_transform(x_test)
```

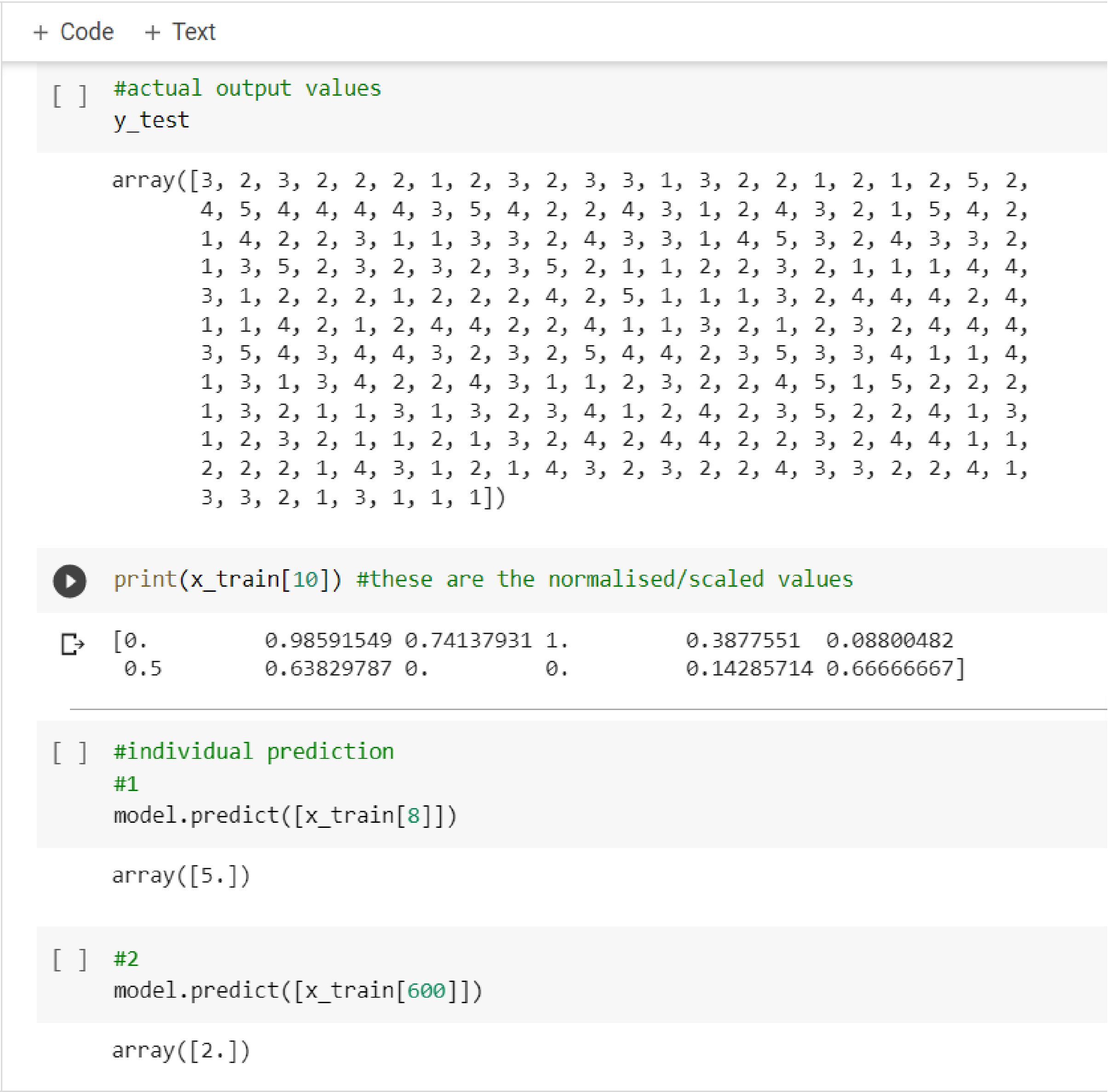
```
#run a classifier/regression/cluster
from sklearn.linear_model import LinearRegression
model=LinearRegression()
```



```
[ ] #fit the model(train the model)
    model.fit(x_train,y_train)

    LinearRegression()
```

```
[ ] #predict the output
    y_pred=model.predict(x_test)
    y_pred

    array([3., 2., 3., 2., 2., 2., 1., 2., 3., 2., 3., 3., 1., 3., 2., 2., 1.,
           2., 1., 2., 5., 2., 4., 5., 4., 4., 4., 4., 3., 5., 4., 2., 2., 4.,
           3., 1., 2., 4., 3., 2., 1., 5., 4., 2., 1., 4., 2., 2., 3., 1., 1.,
           3., 3., 2., 4., 3., 3., 1., 4., 5., 3., 2., 4., 3., 3., 2., 1., 3.,
           5., 2., 3., 2., 3., 2., 3., 5., 2., 1., 1., 2., 2., 3., 2., 1., 1.,
           1., 4., 4., 3., 1., 2., 2., 2., 1., 2., 2., 2., 4., 2., 5., 1., 1.,
           1., 3., 2., 4., 4., 4., 2., 4., 1., 1., 4., 2., 1., 2., 4., 4., 2.,
           2., 4., 1., 1., 3., 2., 1., 2., 3., 2., 4., 4., 4., 3., 5., 4., 3.,
           4., 4., 3., 2., 3., 2., 5., 4., 4., 2., 3., 5., 3., 3., 4., 1., 1.,
           4., 1., 3., 1., 3., 4., 2., 2., 4., 3., 1., 1., 2., 3., 2., 2., 4.,
           5., 1., 5., 2., 2., 2., 1., 3., 2., 1., 1., 3., 1., 3., 2., 3., 4.,
           1., 2., 4., 2., 3., 5., 2., 2., 4., 1., 3., 1., 2., 3., 2., 1., 1.,
           2., 1., 3., 2., 4., 2., 4., 4., 2., 2., 3., 2., 4., 4., 1., 1., 2.,
           2., 2., 1., 4., 3., 1., 2., 1., 4., 3., 2., 3., 2., 2., 4., 3., 3.,
           2., 2., 4., 1., 3., 3., 2., 1., 3., 1., 1., 1.])
```

```
    #actual output values
    y_test

    array([3, 2, 3, 2, 2, 2, 1, 2, 3, 2, 3, 3, 1, 3, 2, 2, 1, 2, 1, 2, 5, 2,
           4, 5, 4, 4, 4, 4, 3, 5, 4, 2, 2, 4, 3, 1, 2, 4, 3, 2, 1, 5, 4, 2,
           1, 4, 2, 2, 3, 1, 1, 3, 3, 2, 4, 3, 3, 1, 4, 5, 3, 2, 4, 3, 3, 2,
           1, 3, 5, 2, 3, 2, 3, 2, 3, 5, 2, 1, 1, 2, 2, 3, 2, 1, 1, 1, 4, 4,
           3, 1, 2, 2, 2, 1, 2, 2, 2, 4, 2, 5, 1, 1, 1, 3, 2, 4, 4, 4, 2, 4,
```



```
#actual output values
y_test
```

```
array([3, 2, 3, 2, 2, 2, 1, 2, 3, 2, 3, 3, 1, 3, 2, 2, 1, 2, 1, 2, 5, 2,
       4, 5, 4, 4, 4, 4, 3, 5, 4, 2, 2, 4, 3, 1, 2, 4, 3, 2, 1, 5, 4, 2,
       1, 4, 2, 2, 3, 1, 1, 3, 3, 2, 4, 3, 3, 1, 4, 5, 3, 2, 4, 3, 3, 2,
       1, 3, 5, 2, 3, 2, 3, 2, 3, 5, 2, 1, 1, 2, 2, 3, 2, 1, 1, 1, 4, 4,
       3, 1, 2, 2, 2, 1, 2, 2, 2, 4, 2, 5, 1, 1, 1, 3, 2, 4, 4, 4, 2, 4,
       1, 1, 4, 2, 1, 2, 4, 4, 2, 2, 4, 1, 1, 3, 2, 1, 2, 3, 2, 4, 4, 4,
       3, 5, 4, 3, 4, 4, 3, 2, 3, 2, 5, 4, 4, 2, 3, 5, 3, 3, 4, 1, 1, 4,
       1, 3, 1, 3, 4, 2, 2, 4, 3, 1, 1, 2, 3, 2, 2, 4, 5, 1, 5, 2, 2, 2,
       1, 3, 2, 1, 1, 3, 1, 3, 2, 3, 4, 1, 2, 4, 2, 3, 5, 2, 2, 4, 1, 3,
       1, 2, 3, 2, 1, 1, 2, 1, 3, 2, 4, 2, 4, 4, 2, 2, 3, 2, 4, 4, 1, 1,
       2, 2, 2, 1, 4, 3, 1, 2, 1, 4, 3, 2, 3, 2, 2, 4, 3, 3, 2, 2, 4, 1,
       3, 3, 2, 1, 3, 1, 1, 1])
```

```
print(x_train[10]) #these are the normalised/scaled values
```

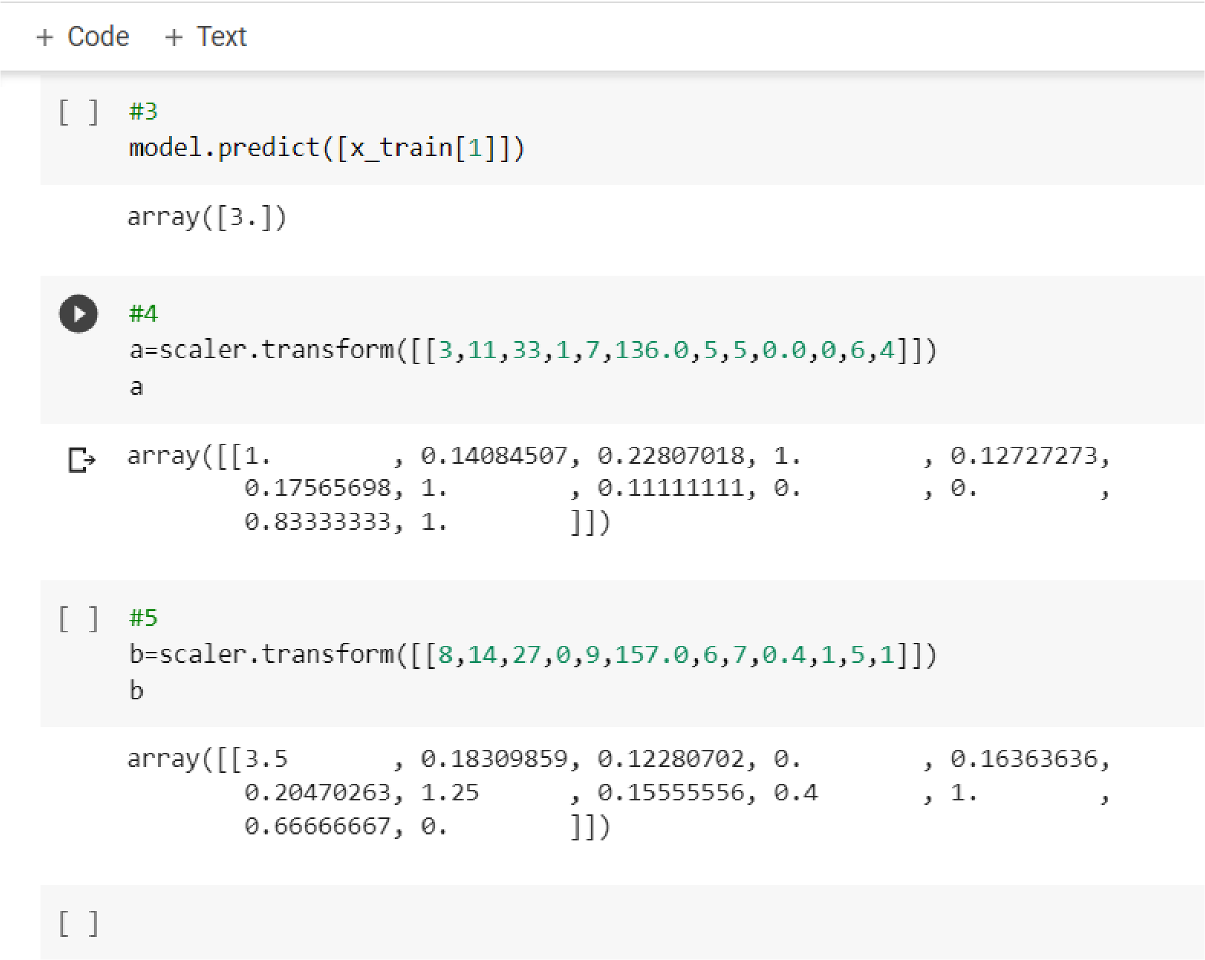
```
[0.         0.98591549 0.74137931 1.         0.3877551  0.08800482
 0.5        0.63829787 0.         0.         0.14285714 0.66666667]
```

```
#individual prediction
#1
model.predict([x_train[8]])
```

```
array([5.])
```

```
#2
model.predict([x_train[600]])
```

```
array([2.])
```



```
#3
model.predict([x_train[1]])
```

```
array([3.])
```

```
#4
a=scaler.transform([[3,11,33,1,7,136.0,5,5,0.0,0,6,4]])
a
```

```
array([[1.        , 0.14084507, 0.22807018, 1.        , 0.12727273,
        0.17565698, 1.        , 0.11111111, 0.        , 0.        ,
        0.83333333, 1.        ]])
```

```
#5
b=scaler.transform([[8,14,27,0,9,157.0,6,7,0.4,1,5,1]])
b
```

```
array([[3.5       , 0.18309859, 0.12280702, 0.        , 0.16363636,
        0.20470263, 1.25      , 0.15555556, 0.4       , 1.        ,
        0.66666667, 0.        ]])
```

Dataset URL: https://raw.githubusercontent.com/Sumank02/datasets/main/telecom.csv

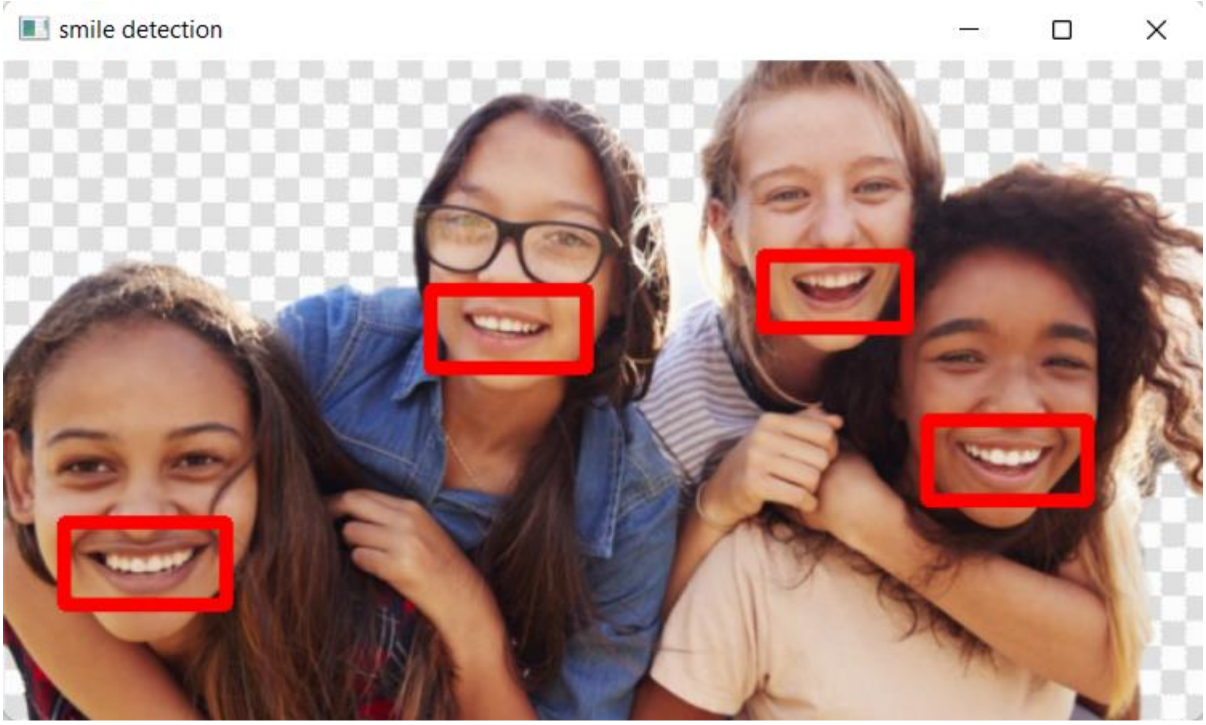
My GitHub URL: https://github.com/Sumank02

Smile Detection

Source Code

```
#MAJOR PROJECT - 2
#Smile Dectection



import cv2
smile_cascade=cv2.CascadeClassifier('C:/Users/Suman/Desktop/RINEX_PROJs/major_proj_2/haarcascade_smile.xml') #importing haarcascade file



img=cv2.imread('mk-4.png') #reading image
gray=cv2.cvtColor(img,cv2.COLOR_BGR2GRAY)

smiles=smile_cascade.detectMultiScale(gray,scaleFactor=1.1,minNeighbors=89)
#SaleFactor and minNeighbors are tuning parameters for better image
#ScaleFactor can be in range or 0 to 1.5 and minNeighbors are in the range of 2 to 20/25



for x,y,w,h in smiles:
    img=cv2.rectangle(img,(x,y),(x+w,y+h),(0,0,255),5) #w-width & h-height

cv2.imshow('smile detection',img)
cv2.waitKey(0) #to view the output image permanently
cv2.destroyAllWindows()
```

SNAPSHOTS



Haarcascade URL:
https://raw.githubusercontent.com/Sumank02/haarcascade/main/haarcascade_smile.xml

My GitHub URL: https://github.com/Sumank02