**PRACTICAL NO: 01**

[1]:

**import pandas as pd**

**from sklearn.linear\_model import** LinearRegression

**import matplotlib.pyplot as plt**

NAME: DHARATI TARAR

ROLL NO: 03

# House price prediction using the linear regression single variable

[2]:

C:\Users\HP\anaconda3\lib\site-packages\scipy\ init .py:146: UserWarning: A NumPy version >=1.16.5 and <1.23.0 is required for this version of SciPy (detected version 1.26.3

warnings.warn(f"A NumPy version >={np\_minversion} and <{np\_maxversion}"

# load Dataset

dataset = pd.read\_csv('house dataset.csv') dataset.head(10)

|  |  |  |  |
| --- | --- | --- | --- |
| [2]: |  | area | price |
|  | 0 | 8450 | 208500 |
|  | 1 | 9600 | 181500 |
|  | 2 | 11250 | 223500 |
|  | 3 | 9550 | 140000 |
|  | 4 | 14260 | 250000 |
|  | 5 | 14115 | 143000 |
|  | 6 | 10084 | 307000 |
|  | 7 | 10382 | 200000 |
|  | 8 | 6120 | 129900 |
|  | 9 | 7420 | 118000 |

[3]:

dataset.tail()

|  |  |  |
| --- | --- | --- |
| [3]: | area | price |
|  | 1455 7917 | 175000 |
|  | 1456 13175 | 210000 |
|  | 1457 9042 | 266500 |
|  | 1458 9717 | 142125 |

1459 9937 147500

[4]:

dataset.shape

[4]: (1460, 2)

[5]:

[6]:

# Load summarise

dataset.info()

<class 'pandas.core.frame.DataFrame'> RangeIndex: 1460 entries, 0 to 1459 Data columns (total 2 columns):

# Column Non-Null Count Dtype

* 1. area 1460 non-null int64
  2. price 1460 non-null int64 dtypes: int64(2)

memory usage: 22.9 KB

dataset.describe()

|  |  |  |  |
| --- | --- | --- | --- |
| [6]: |  | area | price |
|  | count | 1460.000000 | 1460.000000 |
|  | mean | 10516.828082 | 180921.195890 |
|  | std | 9981.264932 | 79442.502883 |
|  | min | 1300.000000 | 34900.000000 |
|  | 25% | 7553.500000 | 129975.000000 |
|  | 50% | 9478.500000 | 163000.000000 |
|  | 75% | 11601.500000 | 214000.000000 |
|  | max | 215245.000000 | 755000.000000 |

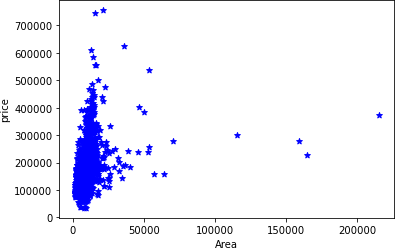
[7]:

# Visulize Dataset

[7]: <matplotlib.collections.PathCollection at 0x1ac76e2b7f0>

plt.xlabel('Area') plt.ylabel('price')

plt.scatter(dataset.area,dataset.price,color='blue',marker='\*')



[8]:

X=dataset.drop('price',axis='columns') X

# segregate dataset using into input X & output Y

|  |  |  |
| --- | --- | --- |
| [8]: |  | area |
|  | 0 | 8450 |
|  | 1 | 9600 |
|  | 2 | 11250 |
|  | 3 | 9550 |
|  | 4 | 14260 |
|  | … | … |
|  | 1455 | 7917 |
|  | 1456 | 13175 |
|  | 1457 | 9042 |
|  | 1458 | 9717 |
|  | 1459 | 9937 |

[1460 rows x 1 columns]

[9]:

Y = dataset.price Y

|  |  |  |
| --- | --- | --- |
| [9]: | 0 | 208500 |
|  | 1 | 181500 |
|  | 2 | 223500 |
|  | 3 | 140000 |
|  | 4 | 250000  … |
| 1455 | | 175000 |
| 1456 | | 210000 |
| 1457 | | 266500 |
| 1458 | | 142125 |
| 1459 | | 147500 |
| Name: | | price, Length: 1460, dtype: int64 |

[10]:

# training dataset using linear regression

[10]: LinearRegression()

model= LinearRegression() model.fit(X,Y)

[11]:

x=5000

LandAreainSqFt=[[x]]

predictedmodelResult = model.predict(LandAreainSqFt) print(predictedmodelResult)

# predicated price for land sq.feet of custom values

[12]:

[169336.01165541]

C:\Users\HP\anaconda3\lib\site-packages\sklearn\base.py:450: UserWarning: X does not have valid feature names, but LinearRegression was fitted with feature names

warnings.warn(

# theory calculation

1. **Y = m\*X+b(m is coefficient and b is intercept)**

coefficient -m

m= model.coef\_ print(m)

[2.09997195]

intercept-b

[13]:

b = model.intercept\_ print(b)

[14]:

158836.1518968766

# Y = mx + b

x is independent variable - input - area

y = m\*x +b

print("The price of **{0}** Square feet Land is:**{1}**" .format(x,y[0]))

[15]:

**import pandas as pd**

**from sklearn.linear\_model import** LinearRegression

The price of 5000 Square feet Land is:169336.01165541497

# part B - Exam marks

[16]:

dataset = pd.read\_csv('exam data.csv') dataset.head()

[16]: hours age internet marks 0 6.83 15 1 78.50

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 6.56 | 16 | 0 | 76.74 |
| 2 | NaN | 17 | 1 | 78.68 |
| 3 | 5.67 | 18 | 0 | 71.82 |
| 4 | 8.67 | 19 | 1 | 84.19 |

[17]:

print(dataset.shape) print(dataset.head(5))

(201, 4)

hours age internet marks

|  |  |  |  |
| --- | --- | --- | --- |
| 0 6.83 | 15 | 1 | 78.50 |
| 1 6.56 | 16 | 0 | 76.74 |
| 2 NaN | 17 | 1 | 78.68 |
| 3 5.67 | 18 | 0 | 71.82 |
| 4 8.67 | 19 | 1 | 84.19 |

[18]:

X = dataset.iloc[:, :-1].values print(X.shape)

X

(201, 3)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| [18]: | array([[ | 6.83, | 15. | , | 1. | ], |
|  | [ | 6.56, | 16. | , | 0. | ], |
|  | [ | nan, | 17. | , | 1. | ], |
|  | [ | 5.67, | 18. | , | 0. | ], |
|  | [ | 8.67, | 19. | , | 1. | ], |
|  | [ | 7.55, | 20. | , | 0. | ], |
|  | [ | 6.67, | 15. | , | 0. | ], |
|  | [ | 8.99, | 16. | , | 0. | ], |
|  | [ | 5.19, | 17. | , | 1. | ], |
|  | [ | 6.75, | 18. | , | 0. | ], |
|  | [ | 6.59, | 19. | , | 0. | ], |
|  | [ | 8.56, | 20. | , | 1. | ], |
|  | [ | 7.75, | 15. | , | 0. | ], |
|  | [ | 7.9 , | 16. | , | 1. | ], |
|  | [ | 8.19, | 17. | , | 0. | ], |
|  | [ | 6.55, | 18. | , | 1. | ], |
|  | [ | 6.36, | 19. | , | 0. | ], |
|  | [ | 8.44, | 20. | , | 1. | ], |
|  | [ | 8.41, | 15. | , | 0. | ], |
|  | [ | 7.67, | 16. | , | 1. | ], |
|  | [ | 7.42, | 17. | , | 1. | ], |
|  | [ | 8.16, | 18. | , | 1. | ], |
|  | [ | 5.05, | 19. | , | 1. | ], |
|  | [ | 5.85, | 20. | , | 1. | ], |
|  | [ | 5.45, | 15. | , | 0. | ], |
|  | [ | 7.96, | 16. | , | 0. | ], |
|  | [ | 6.51, | 17. | , | 0. | ], |
|  | [ | 6.73, | 18. | , | 0. | ], |
|  | [ | 5.94, | 19. | , | 1. | ], |
|  | [ | 7.48, | 20. | , | 0. | ], |
|  | [ | 8.13, | 15. | , | 1. | ], |
|  | [ | nan, | 16. | , | 1. | ], |
|  | [ | 5.4 , | 17. | , | 1. | ], |
|  | [ | 8.78, | 18. | , | 0. | ], |
|  | [ | 8.72, | 19. | , | 1. | ], |
|  | [ | 7.1 , | 20. | , | 0. | ], |
|  | [ | 7.86, | 15. | , | 1. | ], |
|  | [ | 7.19, | 16. | , | 0. | ], |
|  | [ | 5.62, | 17. | , | 1. | ], |
|  | [ | 7.88, | 18. | , | 0. | ], |
|  | [ | 5.28, | 19. | , | 1. | ], |
|  | [ | 8.92, | 20. | , | 1. | ], |
|  | [ | 5.46, | 15. | , | 0. | ], |
|  | [ | 8.3 , | 16. | , | 1. | ], |
|  | [ | 8.09, | 17. | , | 0. | ], |
|  | [ | 6.18, | 18. | , | 1. | ], |
|  | [ | 7.01, | 19. | , | 1. | ], |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [ | 5.01, | 20. | , | 0. | ], |
| [ | 5.54, | 15. | , | 1. | ], |
| [ | 5.09, | 16. | , | 1. | ], |
| [ | 5.09, | 17. | , | 0. | ], |
| [ | 7.31, | 18. | , | 1. | ], |
| [ | 8.71, | 19. | , | 0. | ], |
| [ | 5.52, | 20. | , | 1. | ], |
| [ | 8.76, | 15. | , | 0. | ], |
| [ | 8.69, | 16. | , | 1. | ], |
| [ | 5.75, | 17. | , | 1. | ], |
| [ | 8.93, | 18. | , | 1. | ], |
| [ | 5.39, | 19. | , | 1. | ], |
| [ | 5.65, | 20. | , | 0. | ], |
| [ | 5.49, | 15. | , | 1. | ], |
| [ | 7.26, | 16. | , | 1. | ], |
| [ | 6.35, | 17. | , | 0. | ], |
| [ | 7.72, | 18. | , | 1. | ], |
| [ | 8.88, | 19. | , | 0. | ], |
| [ | 5.45, | 20. | , | 1. | ], |
| [ | 7.86, | 15. | , | 1. | ], |
| [ | 8.26, | 16. | , | 0. | ], |
| [ | 5.07, | 17. | , | 1. | ], |
| [ | 8.25, | 18. | , | 0. | ], |
| [ | 5.37, | 19. | , | 1. | ], |
| [ | 5.11, | 20. | , | 1. | ], |
| [ | 6.35, | 15. | , | 0. | ], |
| [ | 7.41, | 16. | , | 1. | ], |
| [ | 7.31, | 17. | , | 0. | ], |
| [ | 6.04, | 18. | , | 1. | ], |
| [ | 5.11, | 19. | , | 1. | ], |
| [ | 6.56, | 20. | , | 0. | ], |
| [ | 5.09, | 15. | , | 1. | ], |
| [ | 5.88, | 16. | , | 0. | ], |
| [ | 8.34, | 17. | , | 1. | ], |
| [ | 7.94, | 18. | , | 0. | ], |
| [ | 6.66, | 19. | , | 1. | ], |
| [ | 6.01, | 20. | , | 1. | ], |
| [ | 6.88, | 15. | , | 0. | ], |
| [ | 5.63, | 16. | , | 1. | ], |
| [ | 5.88, | 17. | , | 0. | ], |
| [ | 8.05, | 18. | , | 1. | ], |
| [ | 5.33, | 19. | , | 0. | ], |
| [ | 8.79, | 20. | , | 0. | ], |
| [ | 7.52, | 15. | , | 1. | ], |
| [ | 8.2 , | 16. | , | 0. | ], |
| [ | 5.44, | 17. | , | 1. | ], |
| [ | 7.9 , | 18. | , | 0. | ], |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [ | 7.69, | 19. | , | 1. | ], |
| [ | 6.09, | 20. | , | 0. | ], |
| [ | nan, | 15. | , | 1. | ], |
| [ | 5.2 , | 16. | , | 1. | ], |
| [ | 8.88, | 17. | , | 0. | ], |
| [ | 8.07, | 18. | , | 1. | ], |
| [ | 6.24, | 19. | , | 1. | ], |
| [ | 7.95, | 20. | , | 0. | ], |
| [ | 8.26, | 15. | , | 0. | ], |
| [ | 7.31, | 16. | , | 1. | ], |
| [ | 7.23, | 17. | , | 1. | ], |
| [ | 6.46, | 18. | , | 1. | ], |
| [ | 5.34, | 19. | , | 1. | ], |
| [ | 5.72, | 20. | , | 1. | ], |
| [ | 5.84, | 15. | , | 0. | ], |
| [ | 5.02, | 16. | , | 1. | ], |
| [ | 7.98, | 17. | , | 0. | ], |
| [ | 6.37, | 18. | , | 1. | ], |
| [ | 6.92, | 19. | , | 0. | ], |
| [ | 7.95, | 20. | , | 1. | ], |
| [ | 7.12, | 15. | , | 0. | ], |
| [ | 5.79, | 16. | , | 1. | ], |
| [ | 5.4 , | 17. | , | 0. | ], |
| [ | 8.83, | 18. | , | 1. | ], |
| [ | 5.69, | 19. | , | 0. | ], |
| [ | 6.6 , | 20. | , | 1. | ], |
| [ | 6.52, | 15. | , | 0. | ], |
| [ | 8.31, | 16. | , | 0. | ], |
| [ | nan, | 17. | , | 1. | ], |
| [ | 7.62, | 18. | , | 0. | ], |
| [ | 8.69, | 19. | , | 1. | ], |
| [ | 8.75, | 20. | , | 0. | ], |
| [ | 6.46, | 15. | , | 1. | ], |
| [ | 7.14, | 16. | , | 1. | ], |
| [ | 6.38, | 17. | , | 0. | ], |
| [ | 6.33, | 18. | , | 1. | ], |
| [ | 5.64, | 19. | , | 0. | ], |
| [ | 5.26, | 20. | , | 1. | ], |
| [ | 6.83, | 15. | , | 1. | ], |
| [ | 5.76, | 16. | , | 0. | ], |
| [ | 6.51, | 17. | , | 1. | ], |
| [ | 8.33, | 18. | , | 0. | ], |
| [ | 8.16, | 19. | , | 1. | ], |
| [ | 5.14, | 20. | , | 0. | ], |
| [ | 8.71, | 15. | , | 0. | ], |
| [ | 8.6 , | 16. | , | 1. | ], |
| [ | 8.6 , | 17. | , | 0. | ], |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [ | 7.43, | 18. | , | 1. | ], |
| [ | 7.81, | 19. | , | 1. | ], |
| [ | 6.51, | 20. | , | 0. | ], |
| [ | 8.11, | 15. | , | 1. | ], |
| [ | 8.95, | 16. | , | 0. | ], |
| [ | 7.99, | 17. | , | 1. | ], |
| [ | 5.92, | 18. | , | 0. | ], |
| [ | 8.3 , | 19. | , | 1. | ], |
| [ | 8.97, | 20. | , | 0. | ], |
| [ | 5.39, | 15. | , | 0. | ], |
| [ | 6.77, | 16. | , | 0. | ], |
| [ | 8.08, | 17. | , | 1. | ], |
| [ | 5.24, | 18. | , | 0. | ], |
| [ | 6.93, | 19. | , | 1. | ], |
| [ | 5.14, | 20. | , | 0. | ], |
| [ | 8.39, | 15. | , | 1. | ], |
| [ | 6.18, | 16. | , | 0. | ], |
| [ | 7.53, | 17. | , | 1. | ], |
| [ | 7.86, | 18. | , | 0. | ], |
| [ | 7.7 , | 19. | , | 1. | ], |
| [ | 7.3 , | 20. | , | 0. | ], |
| [ | 7.79, | 15. | , | 1. | ], |
| [ | 6.75, | 16. | , | 0. | ], |
| [ | 7.87, | 17. | , | 1. | ], |
| [ | 5.38, | 18. | , | 0. | ], |
| [ | 7.8 , | 19. | , | 1. | ], |
| [ | 5.07, | 20. | , | 0. | ], |
| [ | 7.95, | 15. | , | 1. | ], |
| [ | 8.35, | 16. | , | 0. | ], |
| [ | 5.19, | 17. | , | 0. | ], |
| [ | 7.19, | 18. | , | 0. | ], |
| [ | 7.35, | 19. | , | 1. | ], |
| [ | 5.22, | 20. | , | 1. | ], |
| [ | 5.39, | 15. | , | 1. | ], |
| [ | 5.39, | 16. | , | 1. | ], |
| [ | 8.93, | 17. | , | 1. | ], |
| [ | 5.79, | 18. | , | 0. | ], |
| [ | 8.42, | 19. | , | 1. | ], |
| [ | 7.26, | 20. | , | 0. | ], |
| [ | 6.97, | 15. | , | 1. | ], |
| [ | 5.55, | 16. | , | 1. | ], |
| [ | 8.66, | 17. | , | 0. | ], |
| [ | 8.61, | 18. | , | 1. | ], |
| [ | 5.22, | 19. | , | 1. | ], |
| [ | 8.05, | 20. | , | 0. | ], |
| [ | 8.87, | 15. | , | 1. | ], |
| [ | 5.54, | 16. | , | 0. | ], |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| [ | nan, | 17. | , | 0. | ], |
| [ | 7.26, | 18. | , | 1. | ], |
| [ | 5.79, | 19. | , | 0. | ], |
| [ | 5.22, | 20. | , | 0. | ], |
| [ | 8.71, | 15. | , | 1. | ], |
| [ | 7.55, | 16. | , | 1. | ], |
| [ | 6.35, | 17. | , | 1. | ], |
| [ | 7.53, | 18. | , | 0. | ], |
| [ | 8.56, | 19. | , | 1. | ], |
| [ | 8.94, | 20. | , | 1. | ], |
| [ | 6.6 , | 15. | , | 1. | ], |
| [ | 8.35, | 16. | , | 1. | ], |
| [ | 4.15, | 15. | , | 0. | ]]) |

[19]:

dataset.columns[dataset.isna().any()]

[19]: Index(['hours'], dtype='object')

[20]:

dataset.hours=dataset.hours.fillna(dataset.hours.mean())

[21]:

X= dataset.iloc[:, :-1].values print(X.shape)

X

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | (201, 3) |  | | | | | |
| [21]: | array([[ | 6.83 | , | 15. , | | 1. | ], |
|  | [ | 6.56 | , | 16. , | | 0. | ], |
| [ 6.98142857, 17. , 1. ], | | | | | | | |
| [ | | 5.67 | , | 18. | , | 0. | ], |
| [ | | 8.67 | , | 19. | , | 1. | ], |
| [ | | 7.55 | , | 20. | , | 0. | ], |
| [ | | 6.67 | , | 15. | , | 0. | ], |
| [ | | 8.99 | , | 16. | , | 0. | ], |
| [ | | 5.19 | , | 17. | , | 1. | ], |
| [ | | 6.75 | , | 18. | , | 0. | ], |
| [ | | 6.59 | , | 19. | , | 0. | ], |
| [ | | 8.56 | , | 20. | , | 1. | ], |
| [ | | 7.75 | , | 15. | , | 0. | ], |
| [ | | 7.9 | , | 16. | , | 1. | ], |
| [ | | 8.19 | , | 17. | , | 0. | ], |
| [ | | 6.55 | , | 18. | , | 1. | ], |
| [ | | 6.36 | , | 19. | , | 0. | ], |
| [ | | 8.44 | , | 20. | , | 1. | ], |
| [ | | 8.41 | , | 15. | , | 0. | ], |
| [ | | 7.67 | , | 16. | , | 1. | ], |
| [ | | 7.42 | , | 17. | , | 1. | ], |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| [ | 8.16 | , | 18. | , | 1. | ], |
| [ | 5.05 | , | 19. | , | 1. | ], |
| [ | 5.85 | , | 20. | , | 1. | ], |
| [ | 5.45 | , | 15. | , | 0. | ], |
| [ | 7.96 | , | 16. | , | 0. | ], |
| [ | 6.51 | , | 17. | , | 0. | ], |
| [ | 6.73 | , | 18. | , | 0. | ], |
| [ | 5.94 | , | 19. | , | 1. | ], |
| [ | 7.48 | , | 20. | , | 0. | ], |
| [ | 8.13 | , | 15. | , | 1. | ], |
| [ | 6.98142857, | | 16. | , | 1. | ], |
| [ | 5.4 | , | 17. | , | 1. | ], |
| [ | 8.78 | , | 18. | , | 0. | ], |
| [ | 8.72 | , | 19. | , | 1. | ], |
| [ | 7.1 | , | 20. | , | 0. | ], |
| [ | 7.86 | , | 15. | , | 1. | ], |
| [ | 7.19 | , | 16. | , | 0. | ], |
| [ | 5.62 | , | 17. | , | 1. | ], |
| [ | 7.88 | , | 18. | , | 0. | ], |
| [ | 5.28 | , | 19. | , | 1. | ], |
| [ | 8.92 | , | 20. | , | 1. | ], |
| [ | 5.46 | , | 15. | , | 0. | ], |
| [ | 8.3 | , | 16. | , | 1. | ], |
| [ | 8.09 | , | 17. | , | 0. | ], |
| [ | 6.18 | , | 18. | , | 1. | ], |
| [ | 7.01 | , | 19. | , | 1. | ], |
| [ | 5.01 | , | 20. | , | 0. | ], |
| [ | 5.54 | , | 15. | , | 1. | ], |
| [ | 5.09 | , | 16. | , | 1. | ], |
| [ | 5.09 | , | 17. | , | 0. | ], |
| [ | 7.31 | , | 18. | , | 1. | ], |
| [ | 8.71 | , | 19. | , | 0. | ], |
| [ | 5.52 | , | 20. | , | 1. | ], |
| [ | 8.76 | , | 15. | , | 0. | ], |
| [ | 8.69 | , | 16. | , | 1. | ], |
| [ | 5.75 | , | 17. | , | 1. | ], |
| [ | 8.93 | , | 18. | , | 1. | ], |
| [ | 5.39 | , | 19. | , | 1. | ], |
| [ | 5.65 | , | 20. | , | 0. | ], |
| [ | 5.49 | , | 15. | , | 1. | ], |
| [ | 7.26 | , | 16. | , | 1. | ], |
| [ | 6.35 | , | 17. | , | 0. | ], |
| [ | 7.72 | , | 18. | , | 1. | ], |
| [ | 8.88 | , | 19. | , | 0. | ], |
| [ | 5.45 | , | 20. | , | 1. | ], |
| [ | 7.86 | , | 15. | , | 1. | ], |
| [ | 8.26 | , | 16. | , | 0. | ], |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| [ | 5.07 | , | 17. | , | 1. | ], |
| [ | 8.25 | , | 18. | , | 0. | ], |
| [ | 5.37 | , | 19. | , | 1. | ], |
| [ | 5.11 | , | 20. | , | 1. | ], |
| [ | 6.35 | , | 15. | , | 0. | ], |
| [ | 7.41 | , | 16. | , | 1. | ], |
| [ | 7.31 | , | 17. | , | 0. | ], |
| [ | 6.04 | , | 18. | , | 1. | ], |
| [ | 5.11 | , | 19. | , | 1. | ], |
| [ | 6.56 | , | 20. | , | 0. | ], |
| [ | 5.09 | , | 15. | , | 1. | ], |
| [ | 5.88 | , | 16. | , | 0. | ], |
| [ | 8.34 | , | 17. | , | 1. | ], |
| [ | 7.94 | , | 18. | , | 0. | ], |
| [ | 6.66 | , | 19. | , | 1. | ], |
| [ | 6.01 | , | 20. | , | 1. | ], |
| [ | 6.88 | , | 15. | , | 0. | ], |
| [ | 5.63 | , | 16. | , | 1. | ], |
| [ | 5.88 | , | 17. | , | 0. | ], |
| [ | 8.05 | , | 18. | , | 1. | ], |
| [ | 5.33 | , | 19. | , | 0. | ], |
| [ | 8.79 | , | 20. | , | 0. | ], |
| [ | 7.52 | , | 15. | , | 1. | ], |
| [ | 8.2 | , | 16. | , | 0. | ], |
| [ | 5.44 | , | 17. | , | 1. | ], |
| [ | 7.9 | , | 18. | , | 0. | ], |
| [ | 7.69 | , | 19. | , | 1. | ], |
| [ | 6.09 | , | 20. | , | 0. | ], |
| [ | 6.98142857, | | 15. | , | 1. | ], |
| [ | 5.2 | , | 16. | , | 1. | ], |
| [ | 8.88 | , | 17. | , | 0. | ], |
| [ | 8.07 | , | 18. | , | 1. | ], |
| [ | 6.24 | , | 19. | , | 1. | ], |
| [ | 7.95 | , | 20. | , | 0. | ], |
| [ | 8.26 | , | 15. | , | 0. | ], |
| [ | 7.31 | , | 16. | , | 1. | ], |
| [ | 7.23 | , | 17. | , | 1. | ], |
| [ | 6.46 | , | 18. | , | 1. | ], |
| [ | 5.34 | , | 19. | , | 1. | ], |
| [ | 5.72 | , | 20. | , | 1. | ], |
| [ | 5.84 | , | 15. | , | 0. | ], |
| [ | 5.02 | , | 16. | , | 1. | ], |
| [ | 7.98 | , | 17. | , | 0. | ], |
| [ | 6.37 | , | 18. | , | 1. | ], |
| [ | 6.92 | , | 19. | , | 0. | ], |
| [ | 7.95 | , | 20. | , | 1. | ], |
| [ | 7.12 | , | 15. | , | 0. | ], |

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| [ | 5.79 | , | 16. | , | 1. | ], |
| [ | 5.4 | , | 17. | , | 0. | ], |
| [ | 8.83 | , | 18. | , | 1. | ], |
| [ | 5.69 | , | 19. | , | 0. | ], |
| [ | 6.6 | , | 20. | , | 1. | ], |
| [ | 6.52 | , | 15. | , | 0. | ], |
| [ | 8.31 | , | 16. | , | 0. | ], |
| [ | 6.98142857, | | 17. | , | 1. | ], |
| [ | 7.62 | , | 18. | , | 0. | ], |
| [ | 8.69 | , | 19. | , | 1. | ], |
| [ | 8.75 | , | 20. | , | 0. | ], |
| [ | 6.46 | , | 15. | , | 1. | ], |
| [ | 7.14 | , | 16. | , | 1. | ], |
| [ | 6.38 | , | 17. | , | 0. | ], |
| [ | 6.33 | , | 18. | , | 1. | ], |
| [ | 5.64 | , | 19. | , | 0. | ], |
| [ | 5.26 | , | 20. | , | 1. | ], |
| [ | 6.83 | , | 15. | , | 1. | ], |
| [ | 5.76 | , | 16. | , | 0. | ], |
| [ | 6.51 | , | 17. | , | 1. | ], |
| [ | 8.33 | , | 18. | , | 0. | ], |
| [ | 8.16 | , | 19. | , | 1. | ], |
| [ | 5.14 | , | 20. | , | 0. | ], |
| [ | 8.71 | , | 15. | , | 0. | ], |
| [ | 8.6 | , | 16. | , | 1. | ], |
| [ | 8.6 | , | 17. | , | 0. | ], |
| [ | 7.43 | , | 18. | , | 1. | ], |
| [ | 7.81 | , | 19. | , | 1. | ], |
| [ | 6.51 | , | 20. | , | 0. | ], |
| [ | 8.11 | , | 15. | , | 1. | ], |
| [ | 8.95 | , | 16. | , | 0. | ], |
| [ | 7.99 | , | 17. | , | 1. | ], |
| [ | 5.92 | , | 18. | , | 0. | ], |
| [ | 8.3 | , | 19. | , | 1. | ], |
| [ | 8.97 | , | 20. | , | 0. | ], |
| [ | 5.39 | , | 15. | , | 0. | ], |
| [ | 6.77 | , | 16. | , | 0. | ], |
| [ | 8.08 | , | 17. | , | 1. | ], |
| [ | 5.24 | , | 18. | , | 0. | ], |
| [ | 6.93 | , | 19. | , | 1. | ], |
| [ | 5.14 | , | 20. | , | 0. | ], |
| [ | 8.39 | , | 15. | , | 1. | ], |
| [ | 6.18 | , | 16. | , | 0. | ], |
| [ | 7.53 | , | 17. | , | 1. | ], |
| [ | 7.86 | , | 18. | , | 0. | ], |
| [ | 7.7 | , | 19. | , | 1. | ], |
| [ | 7.3 | , | 20. | , | 0. | ], |

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| [ | 7.79 | , | 15. | , | 1. | ], |
| [ | 6.75 | , | 16. | , | 0. | ], |
| [ | 7.87 | , | 17. | , | 1. | ], |
| [ | 5.38 | , | 18. | , | 0. | ], |
| [ | 7.8 | , | 19. | , | 1. | ], |
| [ | 5.07 | , | 20. | , | 0. | ], |
| [ | 7.95 | , | 15. | , | 1. | ], |
| [ | 8.35 | , | 16. | , | 0. | ], |
| [ | 5.19 | , | 17. | , | 0. | ], |
| [ | 7.19 | , | 18. | , | 0. | ], |
| [ | 7.35 | , | 19. | , | 1. | ], |
| [ | 5.22 | , | 20. | , | 1. | ], |
| [ | 5.39 | , | 15. | , | 1. | ], |
| [ | 5.39 | , | 16. | , | 1. | ], |
| [ | 8.93 | , | 17. | , | 1. | ], |
| [ | 5.79 | , | 18. | , | 0. | ], |
| [ | 8.42 | , | 19. | , | 1. | ], |
| [ | 7.26 | , | 20. | , | 0. | ], |
| [ | 6.97 | , | 15. | , | 1. | ], |
| [ | 5.55 | , | 16. | , | 1. | ], |
| [ | 8.66 | , | 17. | , | 0. | ], |
| [ | 8.61 | , | 18. | , | 1. | ], |
| [ | 5.22 | , | 19. | , | 1. | ], |
| [ | 8.05 | , | 20. | , | 0. | ], |
| [ | 8.87 | , | 15. | , | 1. | ], |
| [ | 5.54 | , | 16. | , | 0. | ], |
| [ 6.98142857, 17. , 0. ], | | | | | | |
| [ | 7.26 | , | 18. | , | 1. | ], |
| [ | 5.79 | , | 19. | , | 0. | ], |
| [ | 5.22 | , | 20. | , | 0. | ], |
| [ | 8.71 | , | 15. | , | 1. | ], |
| [ | 7.55 | , | 16. | , | 1. | ], |
| [ | 6.35 | , | 17. | , | 1. | ], |
| [ | 7.53 | , | 18. | , | 0. | ], |
| [ | 8.56 | , | 19. | , | 1. | ], |
| [ | 8.94 | , | 20. | , | 1. | ], |
| [ | 6.6 | , | 15. | , | 1. | ], |
| [ | 8.35 | , | 16. | , | 1. | ], |
| [ | 4.15 | , | 15. | , | 0. | ]]) |

[22]:

Y =dataset.iloc[:,-1].values Y

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [22]: array([78.5 , | 76.74, 78.68, 71.82, | 84.19, | 81.18, | 76.99, 85.46, 70.66, |
| 77.82, | 75.37, 83.88, 79.5 , | 80.76, | 83.08, | 76.03, 76.04, 85.11, |
| 82.5 , | 80.58, 82.18, 83.36, | 70.67, | 75.02, | 70.96, 83.33, 74.75, |
| 75.65, | 74.15, 80.17, 82.27, | 76.14, | 71.1 , | 84.35, 83.08, 76.76, |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 81.24, | 78.21, | 73.08, | 83.23, | 70.27, | 86.41, | 71.1 , | 82.84, | 82.38, |
| 72.96, | 77.46, | 70.11, | 72.38, | 71.41, | 72.22, | 77.77, | 84.44, | 71.45, |
| 82.21, | 85.48, | 75.03, | 86.65, | 70.9 , | 71.7 , | 73.61, | 79.41, | 76.19, |
| 80.43, | 85.78, | 70.06, | 81.25, | 81.7 , | 69.27, | 82.79, | 71.8 , | 71.79, |
| 74.97, | 78.61, | 77.59, | 72.33, | 72.08, | 77.33, | 70.05, | 73.34, | 84. , |
| 82.93, | 76.63, | 75.36, | 77.29, | 72.87, | 73.4 , | 81.74, | 71.85, | 84.6 , |
| 79.56, | 82.1 , | 72.08, | 79.1 , | 81.01, | 76.48, | 75.39, | 68.57, | 83.64, |
| 82.3 , | 75.18, | 82.03, | 82.99, | 79.26, | 77.55, | 77.07, | 72.1 , | 73.25, |
| 74.25, | 70.58, | 81.08, | 75.04, | 76.38, | 80.86, | 78.42, | 74.44, | 70.34, |
| 85.04, | 73.61, | 75.55, | 76.2 , | 82.69, | 76.83, | 79.53, | 83.57, | 85.95, |
| 76.02, | 77.65, | 77.01, | 74.49, | 73.19, | 71.86, | 75.8 , | 72.46, | 78.39, |
| 83.48, | 83.15, | 71.22, | 85.98, | 83.91, | 84.58, | 80.31, | 82.55, | 75.52, |
| 83.82, | 85.15, | 82.75, | 74.34, | 82.02, | 86.12, | 71.87, | 76.7 , | 81.7 , |
| 70.78, | 78.45, | 70.2 , | 83.37, | 75.52, | 81.57, | 80.72, | 80.81, | 79.49, |
| 79.17, | 77.07, | 82.04, | 71.94, | 81.6 , | 70.79, | 82.68, | 83.08, | 71.18, |
| 77.63, | 77.78, | 70.4 , | 73.02, | 71.11, | 85.96, | 73.64, | 84.24, | 78.17, |
| 77.19, | 71.83, | 86.99, | 83.87, | 71.5 , | 79.63, | 85.1 , | 72.01, | 77.27, |
| 79.87, | 73.14, | 70.51, | 84.03, | 79.64, | 74.24, | 81.67, | 84.68, | 86.75, |
| 78.05, | 83.5 , | 81.45]) |  |  |  |  |  |  |

[23]:

dataset.columns[dataset.isna().any()]

[23]: Index([], dtype='object')

[24]:

dataset.hours =dataset.hours.fillna(dataset.hours.mean())

[25]:

X=dataset.iloc[:,:-1].values print(X.shape)

X

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| (201, 3) |  | | | | | |
| [25]: array([[ | 6.83 | , | 15. , | | 1. | ], |
| [ | 6.56 | , | 16. , | | 0. | ], |
| [ 6.98142857, 17. , 1. ], | | | | | | |
| [ | 5.67 | , | 18. | , | 0. | ], |
| [ | 8.67 | , | 19. | , | 1. | ], |
| [ | 7.55 | , | 20. | , | 0. | ], |
| [ | 6.67 | , | 15. | , | 0. | ], |
| [ | 8.99 | , | 16. | , | 0. | ], |
| [ | 5.19 | , | 17. | , | 1. | ], |
| [ | 6.75 | , | 18. | , | 0. | ], |
| [ | 6.59 | , | 19. | , | 0. | ], |
| [ | 8.56 | , | 20. | , | 1. | ], |
| [ | 7.75 | , | 15. | , | 0. | ], |
| [ | 7.9 | , | 16. | , | 1. | ], |
| [ | 8.19 | , | 17. | , | 0. | ], |

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| [ | 6.55 | , | 18. | , | 1. | ], |
| [ | 6.36 | , | 19. | , | 0. | ], |
| [ | 8.44 | , | 20. | , | 1. | ], |
| [ | 8.41 | , | 15. | , | 0. | ], |
| [ | 7.67 | , | 16. | , | 1. | ], |
| [ | 7.42 | , | 17. | , | 1. | ], |
| [ | 8.16 | , | 18. | , | 1. | ], |
| [ | 5.05 | , | 19. | , | 1. | ], |
| [ | 5.85 | , | 20. | , | 1. | ], |
| [ | 5.45 | , | 15. | , | 0. | ], |
| [ | 7.96 | , | 16. | , | 0. | ], |
| [ | 6.51 | , | 17. | , | 0. | ], |
| [ | 6.73 | , | 18. | , | 0. | ], |
| [ | 5.94 | , | 19. | , | 1. | ], |
| [ | 7.48 | , | 20. | , | 0. | ], |
| [ | 8.13 | , | 15. | , | 1. | ], |
| [ | 6.98142857, | | 16. | , | 1. | ], |
| [ | 5.4 | , | 17. | , | 1. | ], |
| [ | 8.78 | , | 18. | , | 0. | ], |
| [ | 8.72 | , | 19. | , | 1. | ], |
| [ | 7.1 | , | 20. | , | 0. | ], |
| [ | 7.86 | , | 15. | , | 1. | ], |
| [ | 7.19 | , | 16. | , | 0. | ], |
| [ | 5.62 | , | 17. | , | 1. | ], |
| [ | 7.88 | , | 18. | , | 0. | ], |
| [ | 5.28 | , | 19. | , | 1. | ], |
| [ | 8.92 | , | 20. | , | 1. | ], |
| [ | 5.46 | , | 15. | , | 0. | ], |
| [ | 8.3 | , | 16. | , | 1. | ], |
| [ | 8.09 | , | 17. | , | 0. | ], |
| [ | 6.18 | , | 18. | , | 1. | ], |
| [ | 7.01 | , | 19. | , | 1. | ], |
| [ | 5.01 | , | 20. | , | 0. | ], |
| [ | 5.54 | , | 15. | , | 1. | ], |
| [ | 5.09 | , | 16. | , | 1. | ], |
| [ | 5.09 | , | 17. | , | 0. | ], |
| [ | 7.31 | , | 18. | , | 1. | ], |
| [ | 8.71 | , | 19. | , | 0. | ], |
| [ | 5.52 | , | 20. | , | 1. | ], |
| [ | 8.76 | , | 15. | , | 0. | ], |
| [ | 8.69 | , | 16. | , | 1. | ], |
| [ | 5.75 | , | 17. | , | 1. | ], |
| [ | 8.93 | , | 18. | , | 1. | ], |
| [ | 5.39 | , | 19. | , | 1. | ], |
| [ | 5.65 | , | 20. | , | 0. | ], |
| [ | 5.49 | , | 15. | , | 1. | ], |
| [ | 7.26 | , | 16. | , | 1. | ], |

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| [ | 6.35 | , | 17. | , | 0. | ], |
| [ | 7.72 | , | 18. | , | 1. | ], |
| [ | 8.88 | , | 19. | , | 0. | ], |
| [ | 5.45 | , | 20. | , | 1. | ], |
| [ | 7.86 | , | 15. | , | 1. | ], |
| [ | 8.26 | , | 16. | , | 0. | ], |
| [ | 5.07 | , | 17. | , | 1. | ], |
| [ | 8.25 | , | 18. | , | 0. | ], |
| [ | 5.37 | , | 19. | , | 1. | ], |
| [ | 5.11 | , | 20. | , | 1. | ], |
| [ | 6.35 | , | 15. | , | 0. | ], |
| [ | 7.41 | , | 16. | , | 1. | ], |
| [ | 7.31 | , | 17. | , | 0. | ], |
| [ | 6.04 | , | 18. | , | 1. | ], |
| [ | 5.11 | , | 19. | , | 1. | ], |
| [ | 6.56 | , | 20. | , | 0. | ], |
| [ | 5.09 | , | 15. | , | 1. | ], |
| [ | 5.88 | , | 16. | , | 0. | ], |
| [ | 8.34 | , | 17. | , | 1. | ], |
| [ | 7.94 | , | 18. | , | 0. | ], |
| [ | 6.66 | , | 19. | , | 1. | ], |
| [ | 6.01 | , | 20. | , | 1. | ], |
| [ | 6.88 | , | 15. | , | 0. | ], |
| [ | 5.63 | , | 16. | , | 1. | ], |
| [ | 5.88 | , | 17. | , | 0. | ], |
| [ | 8.05 | , | 18. | , | 1. | ], |
| [ | 5.33 | , | 19. | , | 0. | ], |
| [ | 8.79 | , | 20. | , | 0. | ], |
| [ | 7.52 | , | 15. | , | 1. | ], |
| [ | 8.2 | , | 16. | , | 0. | ], |
| [ | 5.44 | , | 17. | , | 1. | ], |
| [ | 7.9 | , | 18. | , | 0. | ], |
| [ | 7.69 | , | 19. | , | 1. | ], |
| [ | 6.09 | , | 20. | , | 0. | ], |
| [ | 6.98142857, | | 15. | , | 1. | ], |
| [ | 5.2 | , | 16. | , | 1. | ], |
| [ | 8.88 | , | 17. | , | 0. | ], |
| [ | 8.07 | , | 18. | , | 1. | ], |
| [ | 6.24 | , | 19. | , | 1. | ], |
| [ | 7.95 | , | 20. | , | 0. | ], |
| [ | 8.26 | , | 15. | , | 0. | ], |
| [ | 7.31 | , | 16. | , | 1. | ], |
| [ | 7.23 | , | 17. | , | 1. | ], |
| [ | 6.46 | , | 18. | , | 1. | ], |
| [ | 5.34 | , | 19. | , | 1. | ], |
| [ | 5.72 | , | 20. | , | 1. | ], |
| [ | 5.84 | , | 15. | , | 0. | ], |

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| [ | 5.02 | , | 16. | , | 1. | ], |
| [ | 7.98 | , | 17. | , | 0. | ], |
| [ | 6.37 | , | 18. | , | 1. | ], |
| [ | 6.92 | , | 19. | , | 0. | ], |
| [ | 7.95 | , | 20. | , | 1. | ], |
| [ | 7.12 | , | 15. | , | 0. | ], |
| [ | 5.79 | , | 16. | , | 1. | ], |
| [ | 5.4 | , | 17. | , | 0. | ], |
| [ | 8.83 | , | 18. | , | 1. | ], |
| [ | 5.69 | , | 19. | , | 0. | ], |
| [ | 6.6 | , | 20. | , | 1. | ], |
| [ | 6.52 | , | 15. | , | 0. | ], |
| [ | 8.31 | , | 16. | , | 0. | ], |
| [ | 6.98142857, | | 17. | , | 1. | ], |
| [ | 7.62 | , | 18. | , | 0. | ], |
| [ | 8.69 | , | 19. | , | 1. | ], |
| [ | 8.75 | , | 20. | , | 0. | ], |
| [ | 6.46 | , | 15. | , | 1. | ], |
| [ | 7.14 | , | 16. | , | 1. | ], |
| [ | 6.38 | , | 17. | , | 0. | ], |
| [ | 6.33 | , | 18. | , | 1. | ], |
| [ | 5.64 | , | 19. | , | 0. | ], |
| [ | 5.26 | , | 20. | , | 1. | ], |
| [ | 6.83 | , | 15. | , | 1. | ], |
| [ | 5.76 | , | 16. | , | 0. | ], |
| [ | 6.51 | , | 17. | , | 1. | ], |
| [ | 8.33 | , | 18. | , | 0. | ], |
| [ | 8.16 | , | 19. | , | 1. | ], |
| [ | 5.14 | , | 20. | , | 0. | ], |
| [ | 8.71 | , | 15. | , | 0. | ], |
| [ | 8.6 | , | 16. | , | 1. | ], |
| [ | 8.6 | , | 17. | , | 0. | ], |
| [ | 7.43 | , | 18. | , | 1. | ], |
| [ | 7.81 | , | 19. | , | 1. | ], |
| [ | 6.51 | , | 20. | , | 0. | ], |
| [ | 8.11 | , | 15. | , | 1. | ], |
| [ | 8.95 | , | 16. | , | 0. | ], |
| [ | 7.99 | , | 17. | , | 1. | ], |
| [ | 5.92 | , | 18. | , | 0. | ], |
| [ | 8.3 | , | 19. | , | 1. | ], |
| [ | 8.97 | , | 20. | , | 0. | ], |
| [ | 5.39 | , | 15. | , | 0. | ], |
| [ | 6.77 | , | 16. | , | 0. | ], |
| [ | 8.08 | , | 17. | , | 1. | ], |
| [ | 5.24 | , | 18. | , | 0. | ], |
| [ | 6.93 | , | 19. | , | 1. | ], |
| [ | 5.14 | , | 20. | , | 0. | ], |

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| [ | 8.39 | , | 15. | , | 1. | ], |
| [ | 6.18 | , | 16. | , | 0. | ], |
| [ | 7.53 | , | 17. | , | 1. | ], |
| [ | 7.86 | , | 18. | , | 0. | ], |
| [ | 7.7 | , | 19. | , | 1. | ], |
| [ | 7.3 | , | 20. | , | 0. | ], |
| [ | 7.79 | , | 15. | , | 1. | ], |
| [ | 6.75 | , | 16. | , | 0. | ], |
| [ | 7.87 | , | 17. | , | 1. | ], |
| [ | 5.38 | , | 18. | , | 0. | ], |
| [ | 7.8 | , | 19. | , | 1. | ], |
| [ | 5.07 | , | 20. | , | 0. | ], |
| [ | 7.95 | , | 15. | , | 1. | ], |
| [ | 8.35 | , | 16. | , | 0. | ], |
| [ | 5.19 | , | 17. | , | 0. | ], |
| [ | 7.19 | , | 18. | , | 0. | ], |
| [ | 7.35 | , | 19. | , | 1. | ], |
| [ | 5.22 | , | 20. | , | 1. | ], |
| [ | 5.39 | , | 15. | , | 1. | ], |
| [ | 5.39 | , | 16. | , | 1. | ], |
| [ | 8.93 | , | 17. | , | 1. | ], |
| [ | 5.79 | , | 18. | , | 0. | ], |
| [ | 8.42 | , | 19. | , | 1. | ], |
| [ | 7.26 | , | 20. | , | 0. | ], |
| [ | 6.97 | , | 15. | , | 1. | ], |
| [ | 5.55 | , | 16. | , | 1. | ], |
| [ | 8.66 | , | 17. | , | 0. | ], |
| [ | 8.61 | , | 18. | , | 1. | ], |
| [ | 5.22 | , | 19. | , | 1. | ], |
| [ | 8.05 | , | 20. | , | 0. | ], |
| [ | 8.87 | , | 15. | , | 1. | ], |
| [ | 5.54 | , | 16. | , | 0. | ], |
| [ | 6.98142857, | | 17. | , | 0. | ], |
| [ | 7.26 | , | 18. | , | 1. | ], |
| [ | 5.79 | , | 19. | , | 0. | ], |
| [ | 5.22 | , | 20. | , | 0. | ], |
| [ | 8.71 | , | 15. | , | 1. | ], |
| [ | 7.55 | , | 16. | , | 1. | ], |
| [ | 6.35 | , | 17. | , | 1. | ], |
| [ | 7.53 | , | 18. | , | 0. | ], |
| [ | 8.56 | , | 19. | , | 1. | ], |
| [ | 8.94 | , | 20. | , | 1. | ], |
| [ | 6.6 | , | 15. | , | 1. | ], |
| [ | 8.35 | , | 16. | , | 1. | ], |
| [ | 4.15 | , | 15. | , | 0. | ]]) |

[26]:

Y= dataset.iloc[:,-1].values Y

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [26]: | array([78.5 , | 76.74, | 78.68, | 71.82, | 84.19, | 81.18, | 76.99, | 85.46, | 70.66, |
|  | 77.82, | 75.37, | 83.88, | 79.5 , | 80.76, | 83.08, | 76.03, | 76.04, | 85.11, |
|  | 82.5 , | 80.58, | 82.18, | 83.36, | 70.67, | 75.02, | 70.96, | 83.33, | 74.75, |
|  | 75.65, | 74.15, | 80.17, | 82.27, | 76.14, | 71.1 , | 84.35, | 83.08, | 76.76, |
|  | 81.24, | 78.21, | 73.08, | 83.23, | 70.27, | 86.41, | 71.1 , | 82.84, | 82.38, |
|  | 72.96, | 77.46, | 70.11, | 72.38, | 71.41, | 72.22, | 77.77, | 84.44, | 71.45, |
|  | 82.21, | 85.48, | 75.03, | 86.65, | 70.9 , | 71.7 , | 73.61, | 79.41, | 76.19, |
|  | 80.43, | 85.78, | 70.06, | 81.25, | 81.7 , | 69.27, | 82.79, | 71.8 , | 71.79, |
|  | 74.97, | 78.61, | 77.59, | 72.33, | 72.08, | 77.33, | 70.05, | 73.34, | 84. , |
|  | 82.93, | 76.63, | 75.36, | 77.29, | 72.87, | 73.4 , | 81.74, | 71.85, | 84.6 , |
|  | 79.56, | 82.1 , | 72.08, | 79.1 , | 81.01, | 76.48, | 75.39, | 68.57, | 83.64, |
|  | 82.3 , | 75.18, | 82.03, | 82.99, | 79.26, | 77.55, | 77.07, | 72.1 , | 73.25, |
|  | 74.25, | 70.58, | 81.08, | 75.04, | 76.38, | 80.86, | 78.42, | 74.44, | 70.34, |
|  | 85.04, | 73.61, | 75.55, | 76.2 , | 82.69, | 76.83, | 79.53, | 83.57, | 85.95, |
|  | 76.02, | 77.65, | 77.01, | 74.49, | 73.19, | 71.86, | 75.8 , | 72.46, | 78.39, |
|  | 83.48, | 83.15, | 71.22, | 85.98, | 83.91, | 84.58, | 80.31, | 82.55, | 75.52, |
|  | 83.82, | 85.15, | 82.75, | 74.34, | 82.02, | 86.12, | 71.87, | 76.7 , | 81.7 , |
|  | 70.78, | 78.45, | 70.2 , | 83.37, | 75.52, | 81.57, | 80.72, | 80.81, | 79.49, |
|  | 79.17, | 77.07, | 82.04, | 71.94, | 81.6 , | 70.79, | 82.68, | 83.08, | 71.18, |
|  | 77.63, | 77.78, | 70.4 , | 73.02, | 71.11, | 85.96, | 73.64, | 84.24, | 78.17, |
|  | 77.19, | 71.83, | 86.99, | 83.87, | 71.5 , | 79.63, | 85.1 , | 72.01, | 77.27, |
|  | 79.87, | 73.14, | 70.51, | 84.03, | 79.64, | 74.24, | 81.67, | 84.68, | 86.75, |
|  | 78.05, | 83.5 , | 81.45]) |  |  |  |  |  |  |

[27]:

model= LinearRegression() model.fit(X,Y)

[27]: LinearRegression()

[28]:

a=[[19,12,0]]

PredictedmodelResult = model.predict(a) print(PredictedmodelResult)

[123.3238236]

[29]:

dataset.describe()

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| [29]: | hours | age | internet | marks |
| count | 201.000000 | 201.000000 | 201.000000 | 201.000000 |
| mean | 6.981429 | 17.467662 | 0.552239 | 77.951244 |
| std | 1.250338 | 1.720523 | 0.498505 | 4.919626 |
| min | 4.150000 | 15.000000 | 0.000000 | 68.570000 |
| 25% | 5.790000 | 16.000000 | 0.000000 | 73.400000 |
| 50% | 6.981429 | 17.000000 | 1.000000 | 77.770000 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 75% | 8.070000 | 19.000000 | 1.000000 | 82.300000 |
| max | 8.990000 | 20.000000 | 1.000000 | 86.990000 |