# PRACTICAL-1

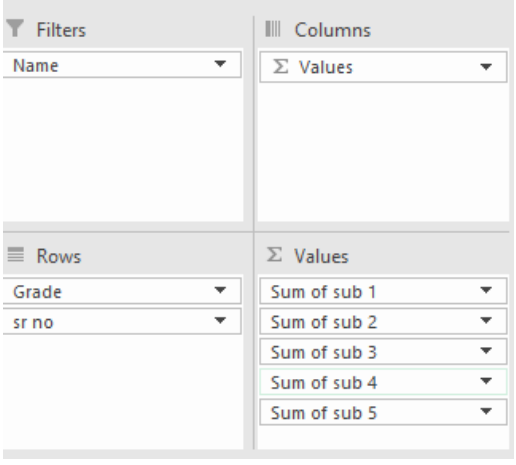
**Aim:- Use MS-Excel to create pivot table & apply statistical measures to it..**

**Data:**

| sr no | Name | sub 1 | sub 2 | sub 3 | sub 4 | sub 5 | Total | Avg | Percanta | Grade |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | hemil | 40 | 37 | 43 | 59 | 50 | 229 | 45.8 | 91.6 | O |
| 2 | raj | 42 | 50 | 40 | 55 | 41 | 228 | 45.6 | 91.2 | O |
| 3 | jenil | 30 | 43 | 46 | 41 | 39 | 199 | 39.8 | 79.6 | A |
| 4 | jay | 40 | 29 | 49 | 36 | 28 | 182 | 36.4 | 72.8 | A |
| 5 | romit | 36 | 38 | 43 | 28 | 39 | 184 | 36.8 | 73.6 | A |
| 6 | dhey | 42 | 41 | 39 | 34 | 35 | 191 | 38.2 | 76.4 | A |
| 7 | sahil | 41 | 39 | 35 | 49 | 36 | 200 | 40 | 80 | A+ |
| 8 | mohan | 36 | 28 | 36 | 48 | 37 | 185 | 37 | 74 | A |
| 9 | radhika | 28 | 39 | 37 | 40 | 38 | 182 | 36.4 | 72.8 | A |
| 10 | utsav | 34 | 35 | 35 | 0 | 0 | 104 | 20.8 | 41.6 | Pass |
| 11 | milan | 49 | 36 | 29 | 48 | 49 | 211 | 42.2 | 84.4 | A+ |
| 12 | jaynesh | 48 | 37 | 49 | 25 | 48 | 207 | 41.4 | 82.8 | A+ |
| 13 | yash | 40 | 38 | 40 | 29 | 42 | 189 | 37.8 | 75.6 | A |
| 14 | krish | 35 | 29 | 37 | 37 | 43 | 181 | 36.2 | 72.4 | A |
| 15 | josh | 48 | 49 | 42 | 40 | 42 | 221 | 44.2 | 88.4 | A+ |
| 16 | moksh | 25 | 48 | 43 | 46 | 41 | 203 | 40.6 | 81.2 | A+ |
| 17 | henil | 29 | 42 | 29 | 49 | 39 | 188 | 37.6 | 75.2 | A |
| 18 | urmil | 37 | 43 | 38 | 43 | 28 | 189 | 37.8 | 75.6 | A |
| 19 | gaga | 42 | 46 | 42 | 37 | 43 | 210 | 42 | 84 | A+ |
| 20 | jisas | 43 | 46 | 41 | 42 | 46 | 218 | 43.6 | 87.2 | A+ |
| 21 | deep | 29 | 49 | 39 | 43 | 46 | 206 | 41.2 | 82.4 | A+ |
| 22 | madhuran | 38 | 43 | 28 | 29 | 49 | 187 | 37.4 | 74.8 | A |
| 23 | nevil | 49 | 42 | 39 | 38 | 43 | 211 | 42.2 | 84.4 | A+ |
| 24 | taksh | 49 | 41 | 35 | 41 | 39 | 205 | 41 | 82 | A+ |
| 25 | deepak | 47 | 39 | 36 | 39 | 35 | 196 | 39.2 | 78.4 | A |
| 26 | shubam | 25 | 25 | 37 | 28 | 25 | 140 | 28 | 56 | B |
| 27 | krisha | 28 | 28 | 38 | 28 | 17 | 139 | 27.8 | 55.6 | B |
| 28 | parth | 26 | 48 | 29 | 35 | 38 | 176 | 35.2 | 70.4 | A |
| 29 | dhreej | 27 | 50 | 49 | 36 | 29 | 191 | 38.2 | 76.4 | A |
| 30 | tejal | 29 | 42 | 38 | 37 | 49 | 195 | 39 | 78 | A |

**Pivot table:**

| Row Labels | Sum of sub 1 | Sum of sub 2 | Sum of sub 3 | Sum of sub 4 | Sum of sub 5 |
|---|---|---|---|---|---|
| A | 520 | 592 | 574 | 561 | 568 |
| A+ | 423 | 433 | 394 | 409 | 433 |
| B | 53 | 53 | 75 | 56 | 42 |
| O | 82 | 87 | 83 | 114 | 91 |
| Pass | 34 | 35 | 35 | 0 | 0 |
| Grand Total | 1112 | 1200 | 1161 | 1140 | 1134 |



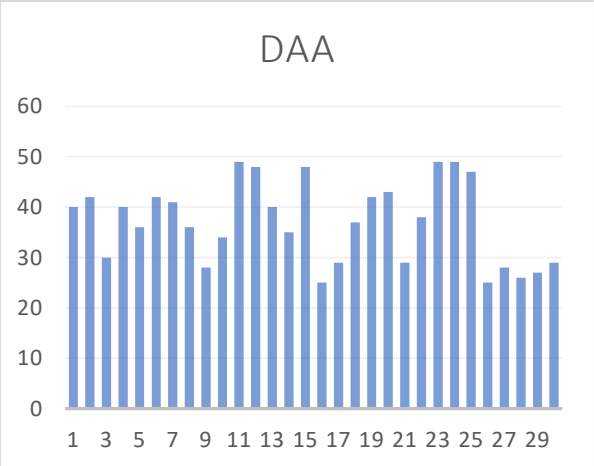
# PRACTICAL-2

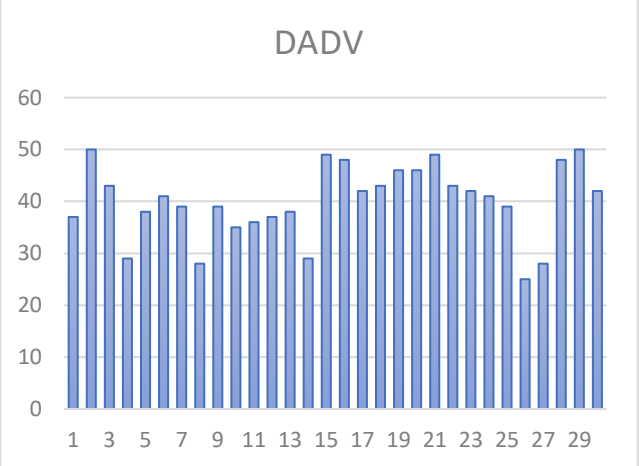
## AIM: Use the Table Created in Above Practical to Generate Different Charts.

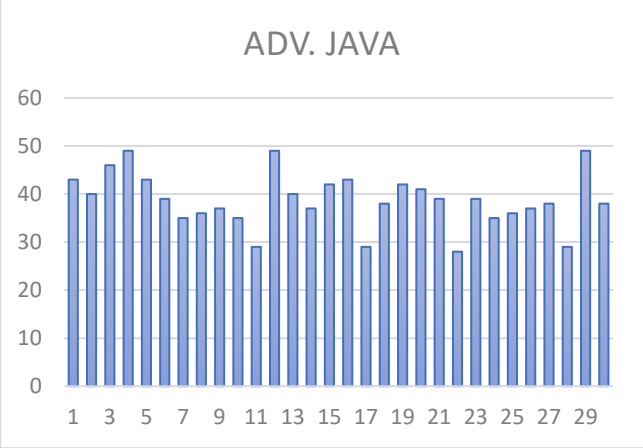
## Data:

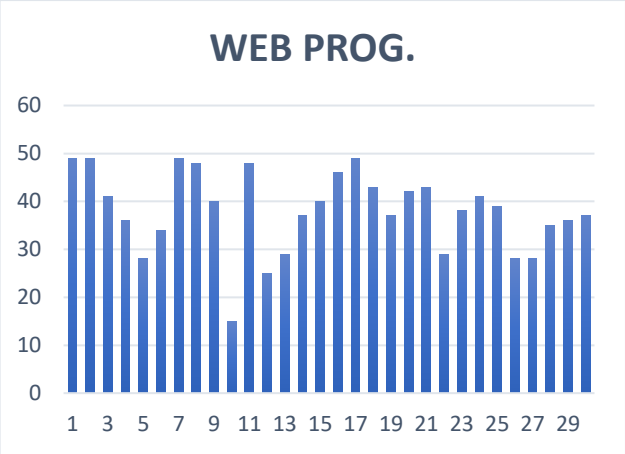
| sr no | Name | DAA | DADV | ADV. JAV | WEB PRO | RES | Total | Avg | Percanta | Grade |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | hemil | 40 | 37 | 43 | 49 | 50 | 219 | 43.8 | 87.6 | A+ |
| 2 | raj | 42 | 50 | 40 | 49 | 41 | 222 | 44.4 | 88.8 | A+ |
| 3 | jenil | 30 | 43 | 46 | 41 | 39 | 199 | 39.8 | 79.6 | A |
| 4 | jay | 40 | 29 | 49 | 36 | 28 | 182 | 36.4 | 72.8 | A |
| 5 | romit | 36 | 38 | 43 | 28 | 39 | 184 | 36.8 | 73.6 | A |
| 6 | dhey | 42 | 41 | 39 | 34 | 35 | 191 | 38.2 | 76.4 | A |
| 7 | sahil | 41 | 39 | 35 | 49 | 36 | 200 | 40 | 80 | A+ |
| 8 | mohan | 36 | 28 | 36 | 48 | 37 | 185 | 37 | 74 | A |
| 9 | radhika | 28 | 39 | 37 | 40 | 38 | 182 | 36.4 | 72.8 | A |
| 10 | utsav | 34 | 35 | 35 | 15 | 45 | 164 | 32.8 | 65.6 | B+ |
| 11 | milan | 49 | 36 | 29 | 48 | 49 | 211 | 42.2 | 84.4 | A+ |
| 12 | jaynesh | 48 | 37 | 49 | 25 | 48 | 207 | 41.4 | 82.8 | A+ |
| 13 | yash | 40 | 38 | 40 | 29 | 42 | 189 | 37.8 | 75.6 | A |
| 14 | krish | 35 | 29 | 37 | 37 | 43 | 181 | 36.2 | 72.4 | A |
| 15 | josh | 48 | 49 | 42 | 40 | 42 | 221 | 44.2 | 88.4 | A+ |
| 16 | moksh | 25 | 48 | 43 | 46 | 41 | 203 | 40.6 | 81.2 | A+ |
| 17 | henil | 29 | 42 | 29 | 49 | 39 | 188 | 37.6 | 75.2 | A |
| 18 | urmil | 37 | 43 | 38 | 43 | 28 | 189 | 37.8 | 75.6 | A |
| 19 | gaga | 42 | 46 | 42 | 37 | 43 | 210 | 42 | 84 | A+ |
| 20 | jisas | 43 | 46 | 41 | 42 | 46 | 218 | 43.6 | 87.2 | A+ |
| 21 | deep | 29 | 49 | 39 | 43 | 46 | 206 | 41.2 | 82.4 | A+ |
| 22 | madhuran | 38 | 43 | 28 | 29 | 49 | 187 | 37.4 | 74.8 | A |
| 23 | nevil | 49 | 42 | 39 | 38 | 43 | 211 | 42.2 | 84.4 | A+ |
| 24 | taksh | 49 | 41 | 35 | 41 | 39 | 205 | 41 | 82 | A+ |
| 25 | deepak | 47 | 39 | 36 | 39 | 35 | 196 | 39.2 | 78.4 | A |
| 26 | shubam | 25 | 25 | 37 | 28 | 25 | 140 | 28 | 56 | B |
| 27 | krisha | 28 | 28 | 38 | 28 | 17 | 139 | 27.8 | 55.6 | B |
| 28 | parth | 26 | 48 | 29 | 35 | 38 | 176 | 35.2 | 70.4 | A |
| 29 | dhreej | 27 | 50 | 49 | 36 | 29 | 191 | 38.2 | 76.4 | A |
| 30 | tejal | 29 | 42 | 38 | 37 | 49 | 195 | 39 | 78 | A |

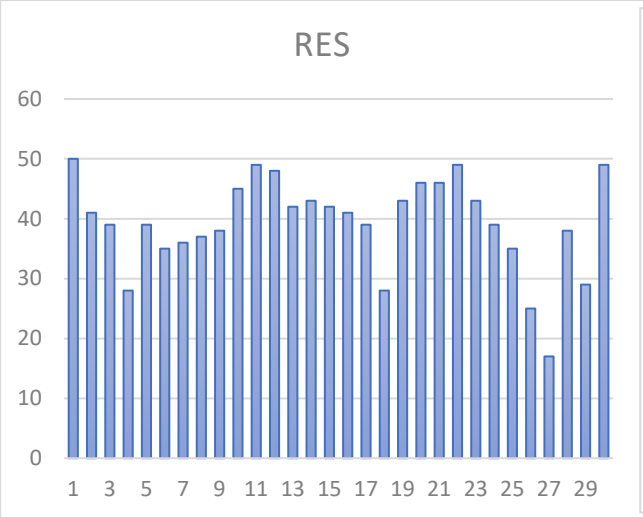
## Output:

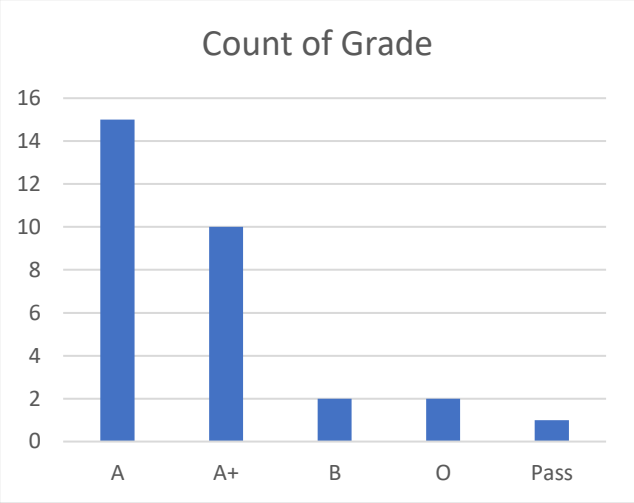


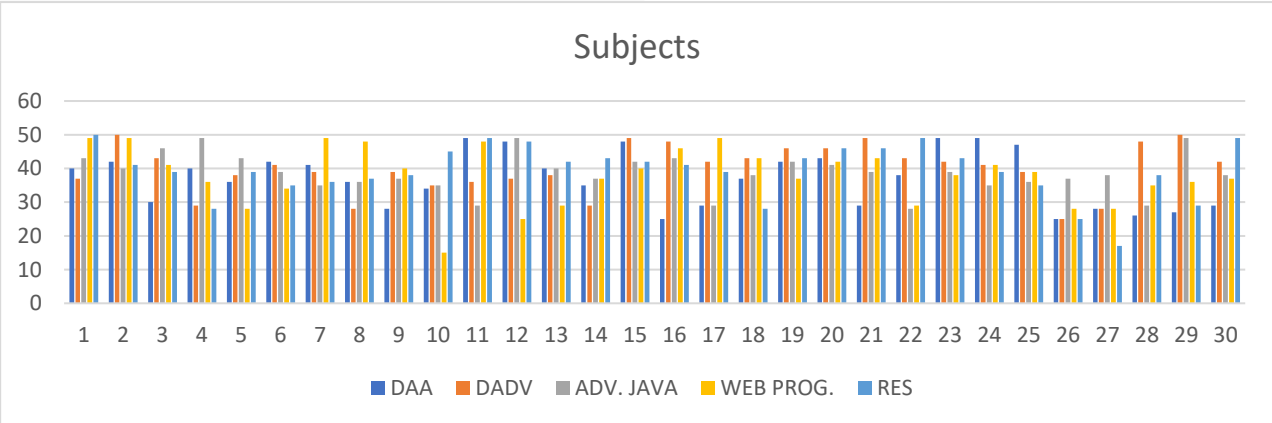



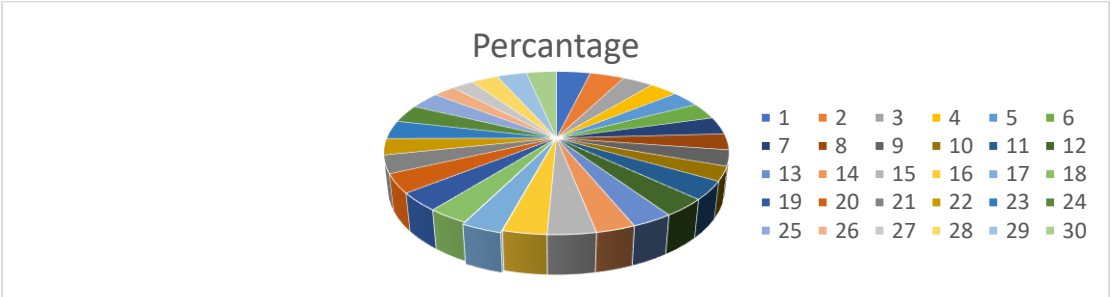

ADV. JAVA
60
50
40
30
20
10
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29


WEB PROG.
60
50
40
30
20
10
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29


RES
60
50
40
30
20
10
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29


Count of Grade
16
14
12
10
8
6
4
2
0
A
A+
B
O
Pass


Subjects
60
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
DAA
DADV
ADV. JAVA
WEB PROG.
RES


Percantage
1 2 3 4 5 6
7 8 9 10 11 12
13 14 15 16 17 18
19 20 21 22 23 24
25 26 27 28 29 30

# PRACTICAL-4

## AIM: Use python libraries to generate chart from data stored in Excel.

## Code:

```
import pandas as pd
from matplotlib import pyplot as plt
raw_data="/content/sample_data/california_housing_train.csv"
df = pd.read_csv(raw_data)
df.describe()
```

## Output:

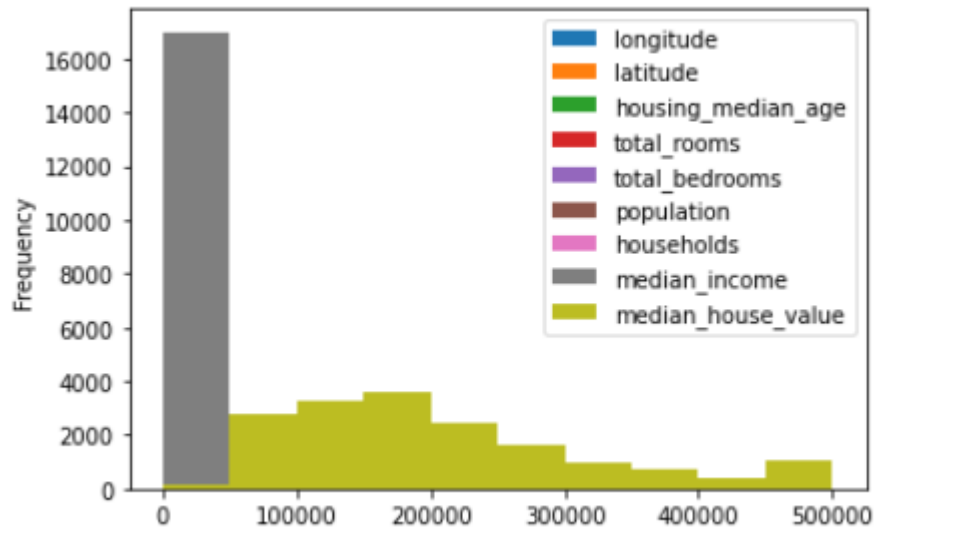
| | longitude | latitude | housing_median_age | total_rooms | total_bedrooms | population | households | median_income | median_house_value |
|---|---|---|---|---|---|---|---|---|---|
| count | 17000.000000 | 17000.000000 | 17000.000000 | 17000.000000 | 17000.000000 | 17000.000000 | 17000.000000 | 17000.000000 | 17000.000000 |
| mean | -119.562108 | 35.625225 | 28.589353 | 2643.664412 | 539.410824 | 1429.573941 | 501.221941 | 3.883578 | 207300.912353 |
| std | 2.005166 | 2.137340 | 12.586937 | 2179.947071 | 421.499452 | 1147.852959 | 384.520841 | 1.908157 | 115983.764387 |
| min | -124.350000 | 32.540000 | 1.000000 | 2.000000 | 1.000000 | 3.000000 | 1.000000 | 0.499900 | 14999.000000 |
| 25% | -121.790000 | 33.930000 | 18.000000 | 1462.000000 | 297.000000 | 790.000000 | 282.000000 | 2.566375 | 119400.000000 |
| 50% | -118.490000 | 34.250000 | 29.000000 | 2127.000000 | 434.000000 | 1167.000000 | 409.000000 | 3.544600 | 180400.000000 |
| 75% | -118.000000 | 37.720000 | 37.000000 | 3151.250000 | 648.250000 | 1721.000000 | 605.250000 | 4.767000 | 265000.000000 |
| max | -114.310000 | 41.950000 | 52.000000 | 37937.000000 | 6445.000000 | 35682.000000 | 6082.000000 | 15.000100 | 500001.000000 |

## Code:

```
df.plot.hist()
```

## Output:

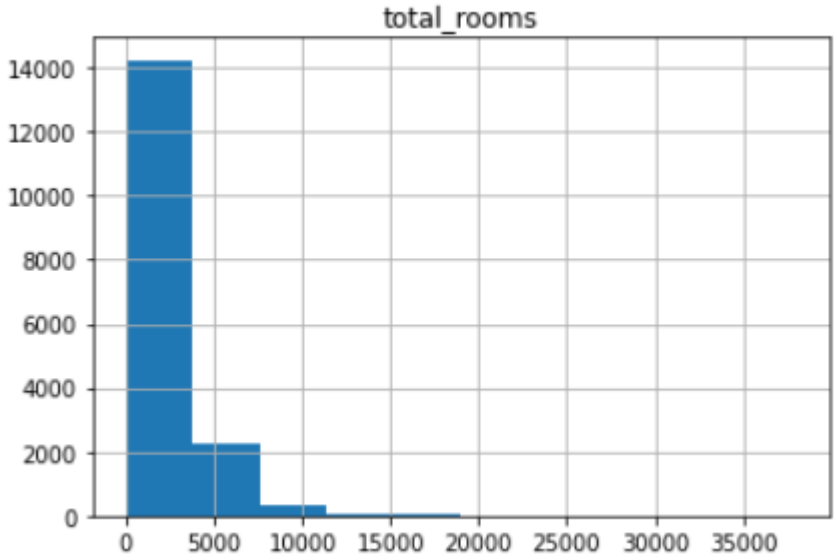
```
<matplotlib.axes._subplots.AxesSubplot at 0x7fb9e2956810>
```




## Code:

```
df.hist(column='total_rooms');
```

## Output:

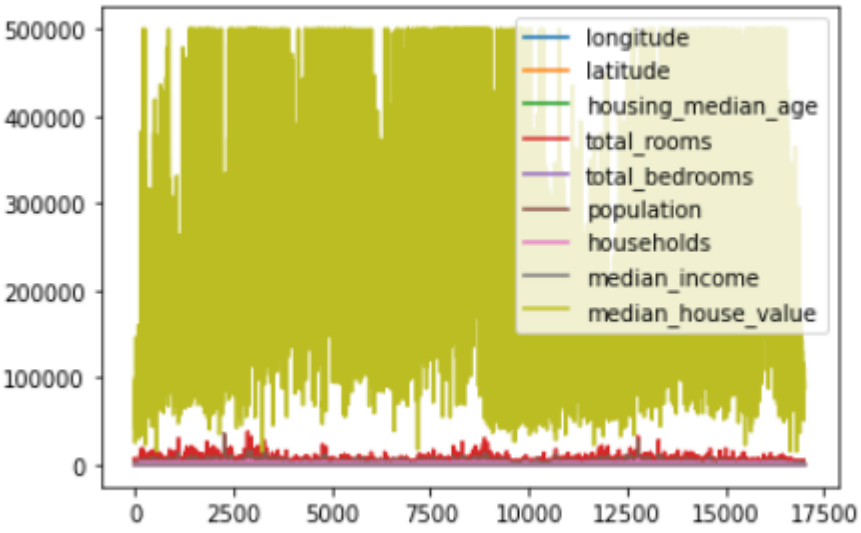



## Code:

```
df.plot.line()
```

## Output:

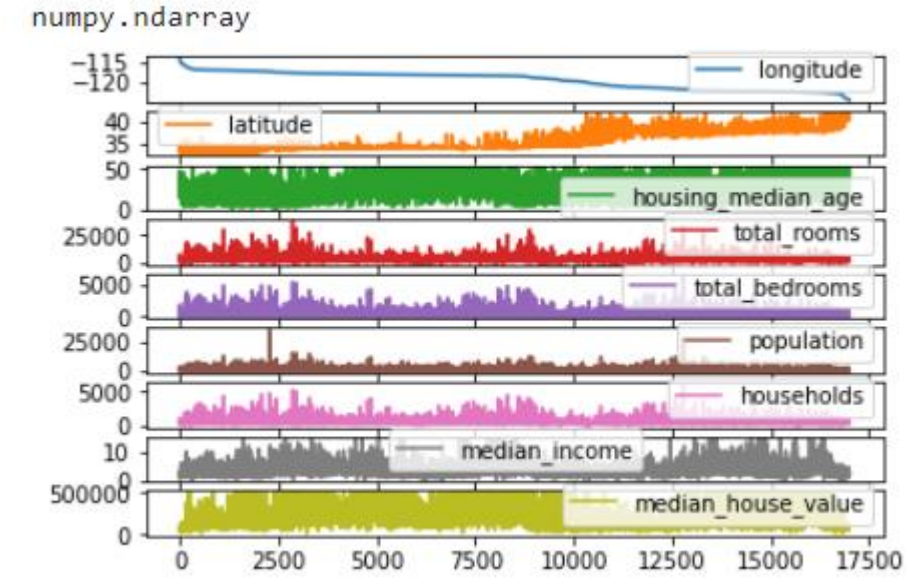
```
<matplotlib.axes._subplots.AxesSubplot at 0x7fb9e2af30d0>
```




## Code:

```
axes = df.plot.line(subplots=True)
type(axes)
```

## Output:


numpy.ndarray
longitude
latitude
housing_median_age
total_rooms
total_bedrooms
population
households
median_income
median_house_value
−115
−120
40
35
50
0
25000
0
5000
0
25000
0
5000
0
10
0
500000
0
0
2500
5000
7500
10000
12500
15000
17500

# PRACTICAL-5

## AIM: Perform Multiple Linear Regression on data.

## Code:

```
# Import Libary
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
# read data
df=pd.read_csv('sample_data/headbrain.csv')
df.head()
```

## Output:

| | Gender | Age Range | Head Size(cm^3) | Brain Weight(grams) |
|---|---|---|---|---|
| 0 | 1 | 1 | 4512 | 1530 |
| 1 | 1 | 1 | 3738 | 1297 |
| 2 | 1 | 1 | 4261 | 1335 |
| 3 | 1 | 1 | 3777 | 1282 |
| 4 | 1 | 1 | 4177 | 1590 |

## Code:

```
# Declare dependent variable(Y) and independent variable(X)
X=df['Head Size(cm^3)'].values
Y = df['Brain Weight(grams)'].values
np.corrcoef(X, Y)
```

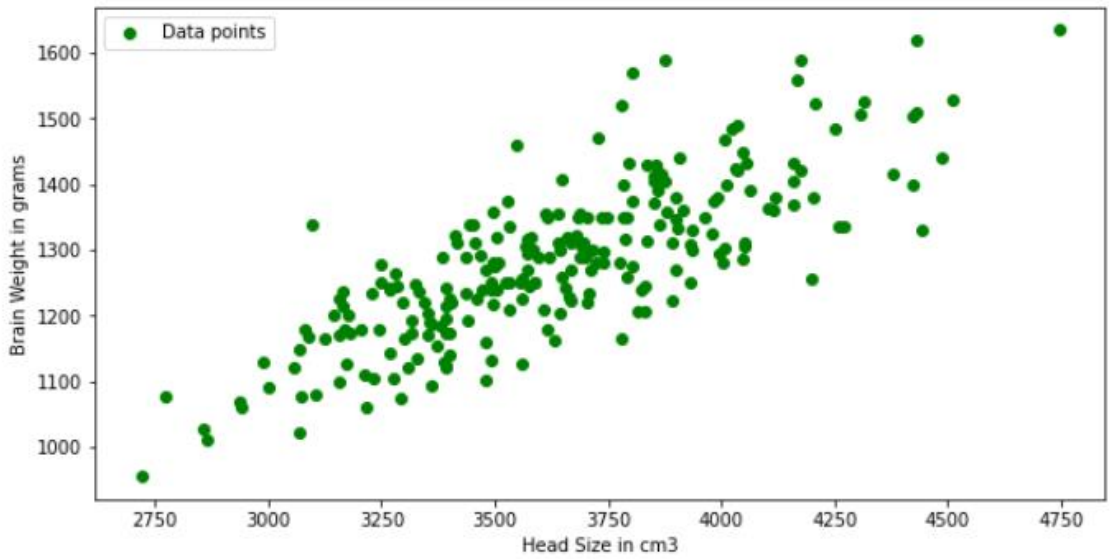
## Output:

```
array([[1. , 0.79956971], [0.79956971, 1. ]])
```

## Code:

```
# Plot the Input Data
plt.scatter(X, Y, c='green', label='Data points')
plt.xlabel('Head Size in cm3')
plt.ylabel('Brain Weight in grams')
plt.legend()
plt.show()
```

## Output:




## Code:

```
# Mean X and Y
mean_x = np.mean(X)
mean_y = np.mean(Y)
# Total number of values
n = len(X)
# Using the formula to calculate theta1 and theta2
numer = 0
denom = 0
for i in range(n):
    numer += (X[i] - mean_x) * (Y[i] - mean_y)
    denom += (X[i] - mean_x) ** 2
b1 = numer / denom
b0 = mean_y - (b1 * mean_x)
# Printing coefficients
print("coefficients for regression",b1, b0)
```

## Output:

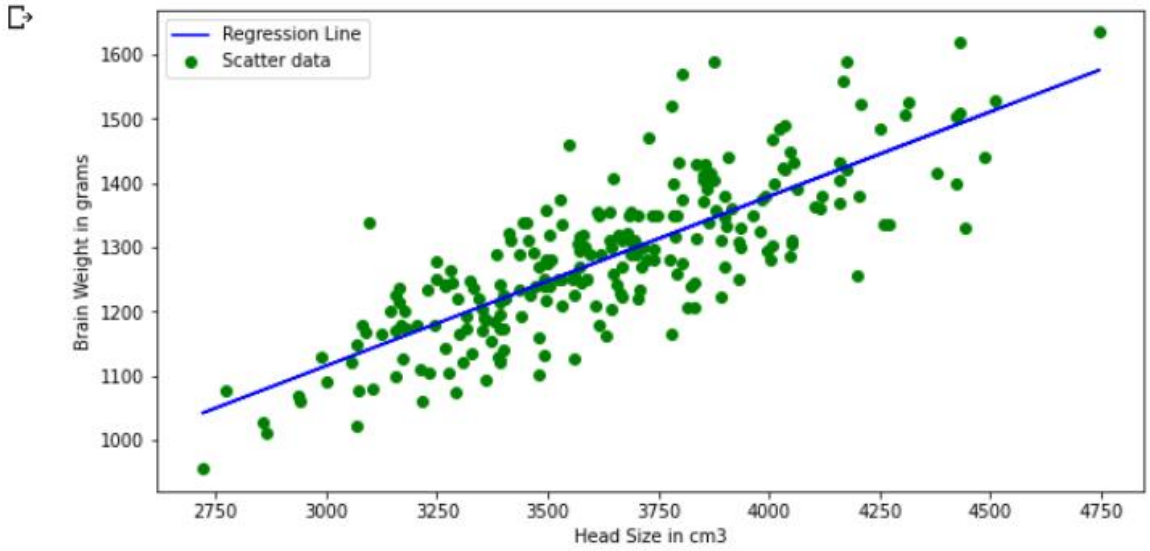
```
coefficients for regression 0.26342933948939945 325.57342104944223
```

## Code:

```
# Plotting Values and Regression Line
%matplotlib inline
plt.rcParams['figure.figsize'] = (10.0, 5.0)
max_x = np.max(X) + 100
min_x = np.min(X) - 100
y = b0 + b1 * X
# Ploting Line
plt.plot(X, y, color='blue', label='Regression Line')
# Ploting Scatter Points
plt.scatter(X, Y, c='green', label='Scatter data')
```

```
plt.xlabel('Head Size in cm3')
plt.ylabel('Brain Weight in grams')
plt.legend()
plt.show()
```

**Output:**



# PRACTICAL-5

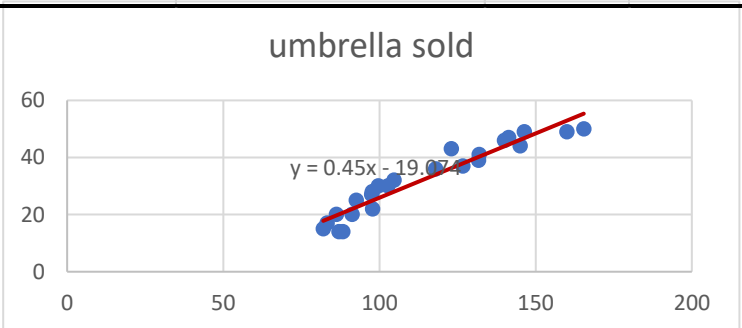
## AIM: Perform the Logistic Regression on a dataset and Interpret the regression table.

## Output:

| month | rain fall | umbrella sold |
|---|---|---|
| jan | 82 | 15 |
| feb | 92.5 | 25 |
| mar | 83.2 | 17 |
| apr | 97.7 | 28 |
| may | 131.9 | 41 |
| jun | 141.3 | 47 |
| jul | 165.4 | 50 |
| aug | 140 | 46 |
| sep | 126.7 | 37 |
| oct | 97.8 | 22 |
| nov | 86.2 | 20 |
| dec | 99.6 | 30 |
| jan | 87 | 14 |
| feb | 97.5 | 27 |
| mar | 88.2 | 14 |
| apr | 102.7 | 30 |
| may | 123 | 43 |
| jun | 146.3 | 49 |
| jul | 160 | 49 |
| aug | 145 | 44 |
| sep | 131.7 | 39 |
| oct | 118 | 36 |
| nov | 91.2 | 20 |
| dec | 104.6 | 32 |

RESIDUAL OUTPUT

| Observation | Predicted umbrella sold | Residuals | Standard Residuals |
|---|---|---|---|
| 1 | 17.82599924 | -2.825999237 | -0.806807846 |
| 2 | 22.5510131 | 2.448986904 | 0.699172817 |
| 3 | 18.36600082 | -1.366000821 | -0.389986015 |
| 4 | 24.89101996 | 3.10898004 | 0.887597369 |
| 5 | 40.2810651 | 0.7189349 | 0.205252114 |
| 6 | 44.51107751 | 2.488922493 | 0.710574217 |
| 7 | 55.35610932 | -5.356109317 | -1.529140901 |
| 8 | 43.92607579 | 2.073924208 | 0.5920944 |
| 9 | 37.94105824 | -0.941058237 | -0.268667153 |
| 10 | 24.93602009 | -2.936020092 | -0.838218218 |
| 11 | 19.71600478 | 0.283995219 | 0.081079134 |
| 12 | 25.74602247 | 4.253977532 | 1.214488101 |
| 13 | 20.07600584 | -6.076005837 | -1.734667552 |
| 14 | 24.8010197 | 2.198980304 | 0.627797254 |
| 15 | 20.61600742 | -6.616007421 | -1.88883515 |
| 16 | 27.14102656 | 2.858973441 | 0.816221806 |
| 17 | 36.27605335 | 6.723946647 | 1.919651229 |
| 18 | 46.76108411 | 2.238915893 | 0.639198654 |
| 19 | 52.92610219 | -3.926102189 | -1.120881424 |
| 20 | 46.17608239 | -2.176082391 | -0.621260021 |
| 21 | 40.19106484 | -1.191064836 | -0.340042715 |
| 22 | 34.02604675 | 1.973953246 | 0.563553219 |
| 23 | 21.96601138 | -1.966011381 | -0.561285858 |
| 24 | 27.99602907 | 4.003970933 | 1.143112539 |




SUMMARY OUTPUT

| Regression Statistics | |
|---|---|
| Multiple R | 0.957666798 |
| R Square | 0.917125697 |
| Adjusted R Square | 0.913358683 |
| Standard Error | 3.58141382 |
| Observations | 24 |

| | | | | | |
|---|---|---|---|---|---|
| rainfall/m | 0.45000132 | | | | |
| x | 82 | | | | |
| intercept/c | -19.07410899 | | | | |
| y=mx+c | 17.82599924 | | | | |

ANOVA

| | df | SS | MS | F | Significance F |
|---|---|---|---|---|---|
| Regression | 1 | 3122.774784 | 3122.774784 | 243.462262 | 2.21604E-13 |
| Residual | 22 | 282.1835489 | 12.82652495 | | |
| Total | 23 | 3404.958333 | | | |

| | Coefficients | Standard Error | t Stat | P-value | Lower 95% | Upper 95% | Lower 95.0% | Upper 95.0% |
|---|---|---|---|---|---|---|---|---|
| Intercept | -19.07410899 | 3.372182168 | -5.656310378 | 1.0929E-05 | -26.06758677 | -12.08063122 | -26.06758677 | -12.08063122 |
| rain fall | 0.45000132 | 0.02884018 | 15.6032773 | 2.216E-13 | 0.390190448 | 0.509812192 | 0.390190448 | 0.509812192 |