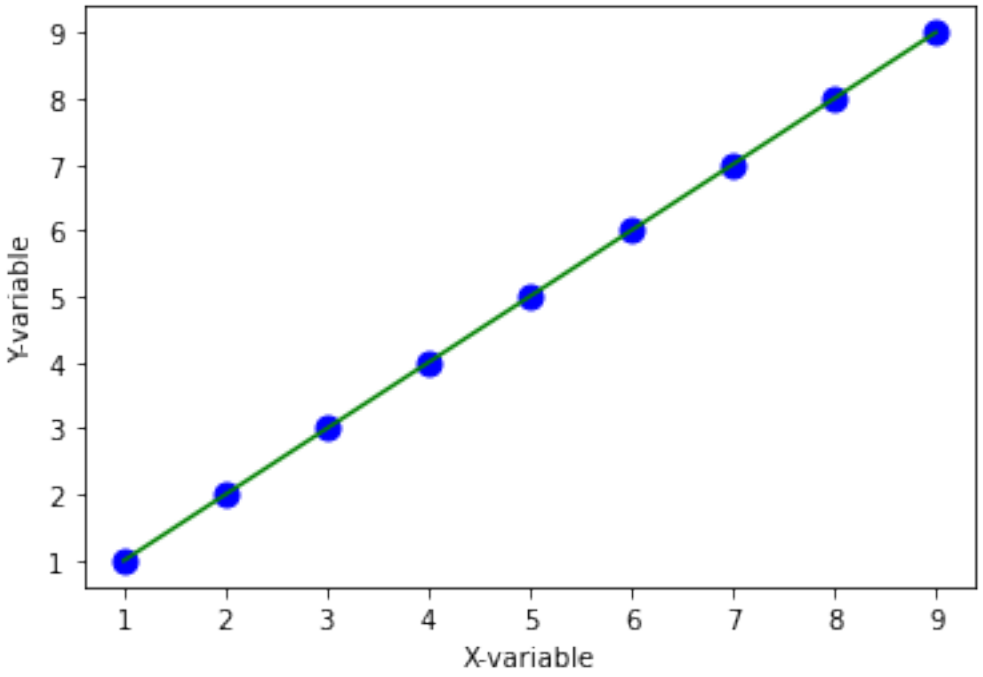
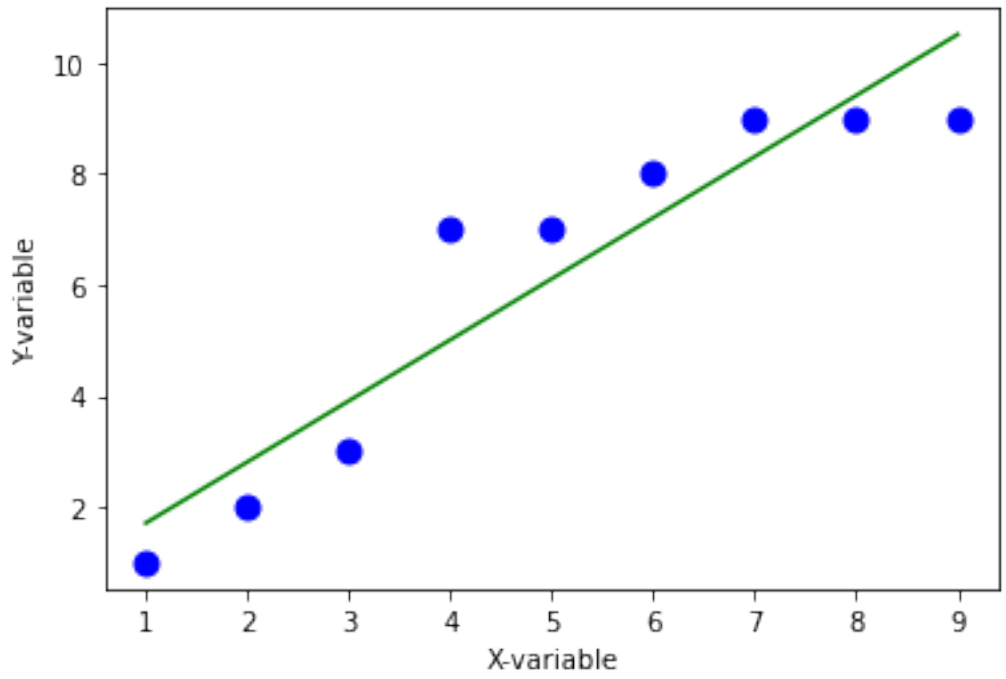
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from operator import mul
import math
def compute_regcoef(x,y):
    n = len(x)
    sumxy = sum(list(map(mul,x,y)))
    num = n* sumxy - sum (x)*sum(y)
    sumxx = sum(list(map(mul,x,x)))
    denom = n*sumxx -sum(x)**2
    m = num/denom
    c =(sum(y)-m*sum(x))/n
    return(c,m)

def plot_regline(x,y,b):
    plt.scatter(x,y,color='b',marker='o',s=80)
    y_pred = np.float_(x)*b[1] + b[0]
    plt.plot(x,y_pred,color='g')
    plt.xlabel('X-variable')
    plt.ylabel('Y-variable')
    plt.show()

x= [1,2,3,4,5,6,7,8,9]
y= [1,2,3,4,5,6,7,8,9]
b= compute_regcoef(x,y)
type(b)
print('intercept',b[0])
print('slope',b[1])
plot_regline(x,y,b)
```

```
intercept 0.0
slope 1.0
```




```
x= [1,2,3,4,5,6,7,8,9]
y= [1,2,3,7,7,8,9,9,9]
b= compute_regcoef(x,y)
type(b)
print('intercept',b[0])
print('slope',b[1])
plot_regline(x,y,b)
```

```
intercept 0.6111111111111103
slope 1.1
```




```
df=pd.read_csv('weight-height.csv')
print(df)
```

```
      Gender     Height      Weight
0       Male  73.847017  241.893563
1       Male  68.781904  162.310473
2       Male  74.110105  212.740856
3       Male  71.730978  220.042470
4       Male  69.881796  206.349801
...      ...        ...         ...
9995  Female  66.172652  136.777454
9996  Female  67.067155  170.867906
9997  Female  63.867992  128.475319
9998  Female  69.034243  163.852461
9999  Female  61.944246  113.649103

[10000 rows x 3 columns]
```

```
df.columns
```

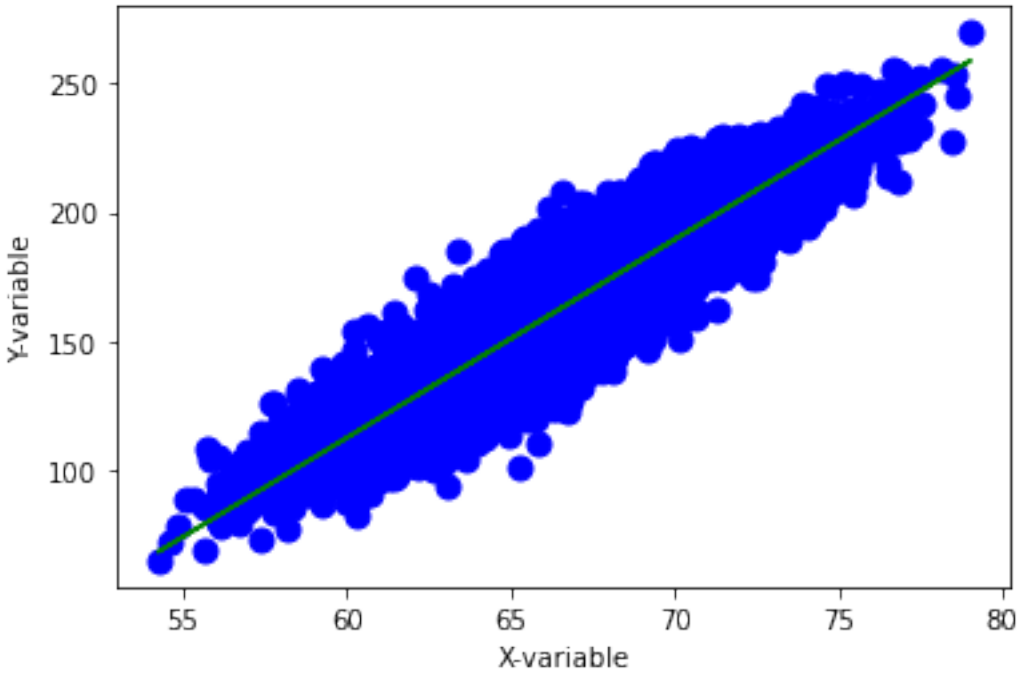
```
Index(['Gender', 'Height', 'Weight'], dtype='object')
```

```
df.dtypes
```

```
Gender     object
Height    float64
Weight    float64
dtype: object
```

```
x=df.iloc[:,1:2].values
y=df.iloc[:,2].values
b=compute_regcoef(x,y)
type(b)
print('intercept',b[0])
print('slope',b[1])
plot_regline(x,y,b)
```

```
intercept [-350.73719181]
slope [7.71728764]
```




```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.25,rand
om_state=0)

from sklearn.linear_model import LinearRegression
regression= LinearRegression()
regression.fit(x_train,y_train)
```

```
LinearRegression()
```

```
m=regression.coef_
print('Regression Coefficient / slope of regression line',m)
```

```
Regression Coefficient / slope of regression line [7.71833809]
```

```
c= regression.intercept_
print('Intercept',c)
```

```
Intercept -350.84158094506427
```

```
y_pred = regression.predict(x_test)
print(y_pred)
```

```
[148.71918181 168.38777621 224.33647637 ... 177.05541851 152.24692441
 117.82424099]
```

```
dfl = pd.DataFrame({'Actual value':y_test.flatten(),'Predicted
Value':y_pred.flatten()})
dfl
```

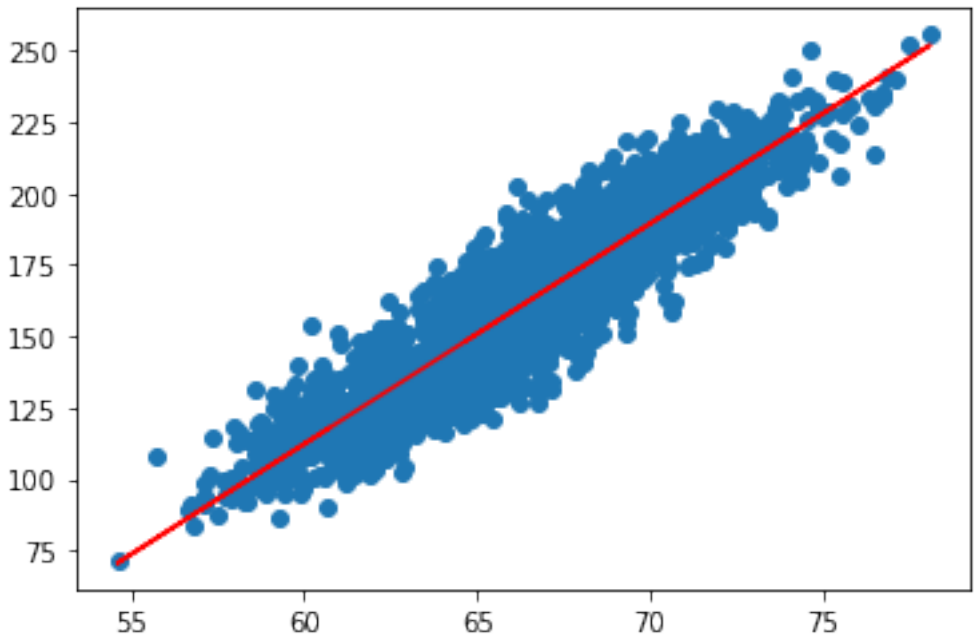
```
      Actual value  Predicted Value
0       138.085796       148.719182
1       187.363366       168.387776
2       216.533191       224.336476
3       131.761443       157.642640
4       157.718438       149.664097
...            ...              ...
2495    121.094631       149.597631
2496    207.493691       203.256212
2497    169.634399       177.055419
2498    169.459631       152.246924
2499    123.628360       117.824241
```

```
[2500 rows x 2 columns]
```

```
x_test[0]*m+c
```

```
array([148.71918181])
```

```
plt.scatter(x_test, y_test)
plt.plot(x_test,y_pred,color='r')
plt.show()
```




```
from sklearn import metrics
print('Mean Absolute
Error',metrics.mean_absolute_error(y_test,y_pred))
print('Mean Squared Error',metrics.mean_squared_error(y_test,y_pred))
print('Root Mean Squared
Error',np.sqrt(metrics.mean_absolute_error(y_test,y_pred)))
```

```
Mean Absolute Error 9.815091837529609
Mean Squared Error 151.46996027337102
Root Mean Squared Error 3.1329046965283847
```