Expt.No.

Page No.
Date.

Assignment - 04 [Simple Linear Regression]

In[1]: import numpy as np

In[2]: import pandas as pd

In[3]: from random import randint

In[4]:
```
def reg_fun(x):
    return 7*x - 3
```

In[5]:
```
x = []
y = []
for _ in range(5):
    t = randint(0, 20)
    print(t, reg_fun(t))
    x.append(t)
    y.append(reg_fun(t) + radiant(-10,10))
```

20	137
10	67
14	95
0	-3
16	109

In[6]:
```
from matplotlib import pyplot as plt.
% matplotlib inline.
```

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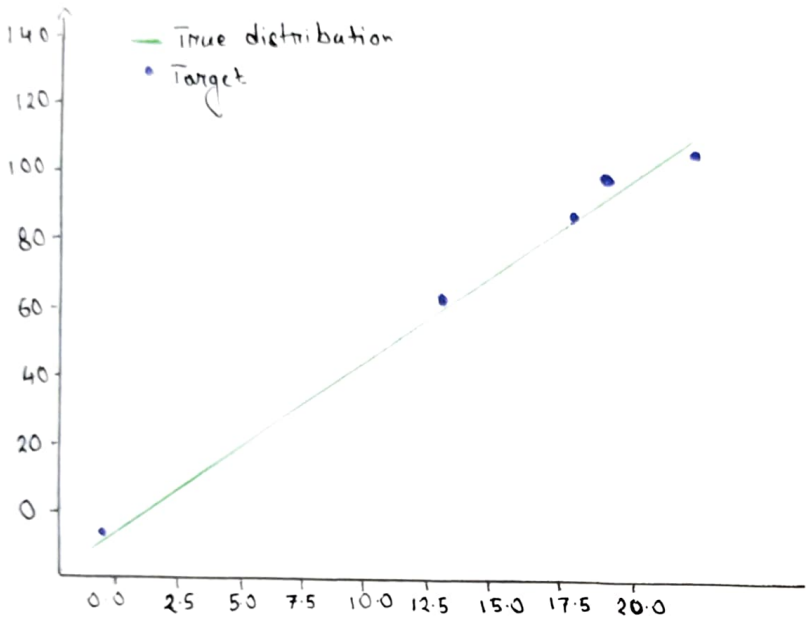
In[7]:

```
plt.plot(x, [reg_fun(i) for i in x], color='green', label='True Distribution')
plt.scatter(x, y, color='blue', label='Target')
plt.legend()
plt.show()
```



In[8]:

```
xbar = np.mean(x)
ybar = np.mean(y)

d = 0

n = 0

for i in range(5):
    d += (x[i]-xbar)**2
    n += (x[i]-xbar)*(y[i]-ybar)
print(np.round((x[i]-xbar)**2,2), np.round((x[i]-xbar)*(y[i]-ybar),2))
w1 = n/d
w0 = ybar - w1*xbar
```

```
64.0    388.8
 4.0     18.8
 4.0     27.2
144.0   1000.8
16.0    123.4
```

Expt.No.

Page No.
Date.

In [9]: print('xbar: ', xbar, 'ybar: ', ybar, 'w0: ', w0, 'w1: ', w1)

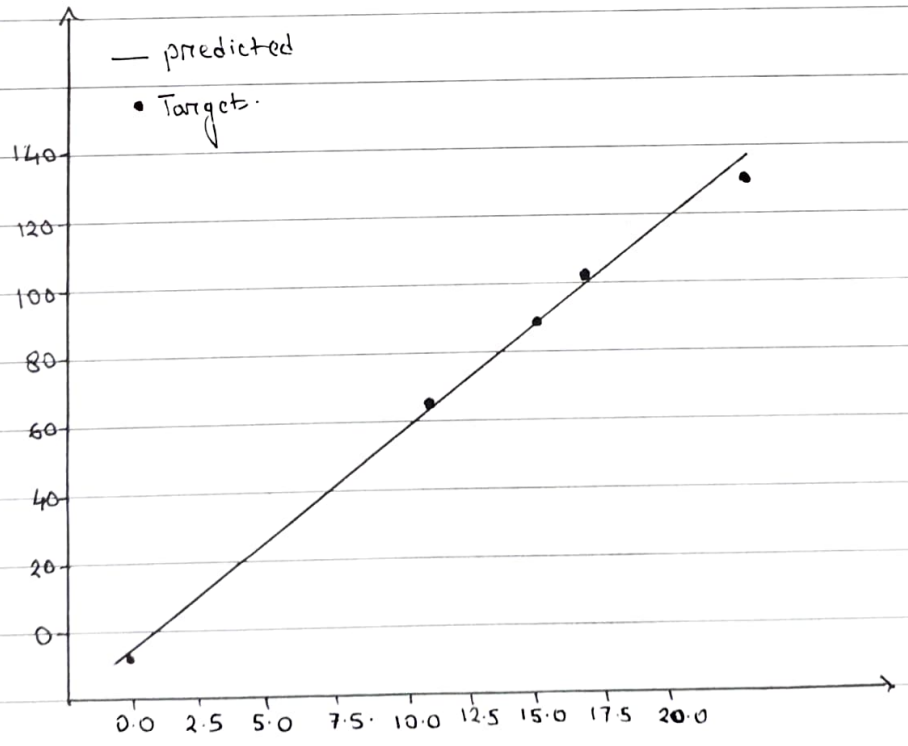
xbar: 12.0 ybar: 84.4 w0: 3.8137931034482756 w1: 6.715517241379305

In [10]: print('n: ', n, 'd: ', d)

n : 1558.0 d: 232.0

In [11]: def model(w0, w1, x):
    return w0+w1*x

In [12]: plt.plot(x, [model(w0, w1, i) for i in x], color='red', label='Predicted')
plt.scatter(x, y, color='blue', label='Target')
plt.legend()
plt.show().



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