Ejemplo1

July 16, 2025

[3]:
```python
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import statsmodels.api as sm
```

[4]:
```python
data = pd.read_csv('1.01.+Simple+linear+regression.csv')
```

[5]:
```python
data
```

[5]:
```
     SAT   GPA
0   1714  2.40
1   1664  2.52
2   1760  2.54
3   1685  2.74
4   1693  2.83
..   …     …
79  1936  3.71
80  1810  3.71
81  1987  3.73
82  1962  3.76
83  2050  3.81

[84 rows x 2 columns]
```

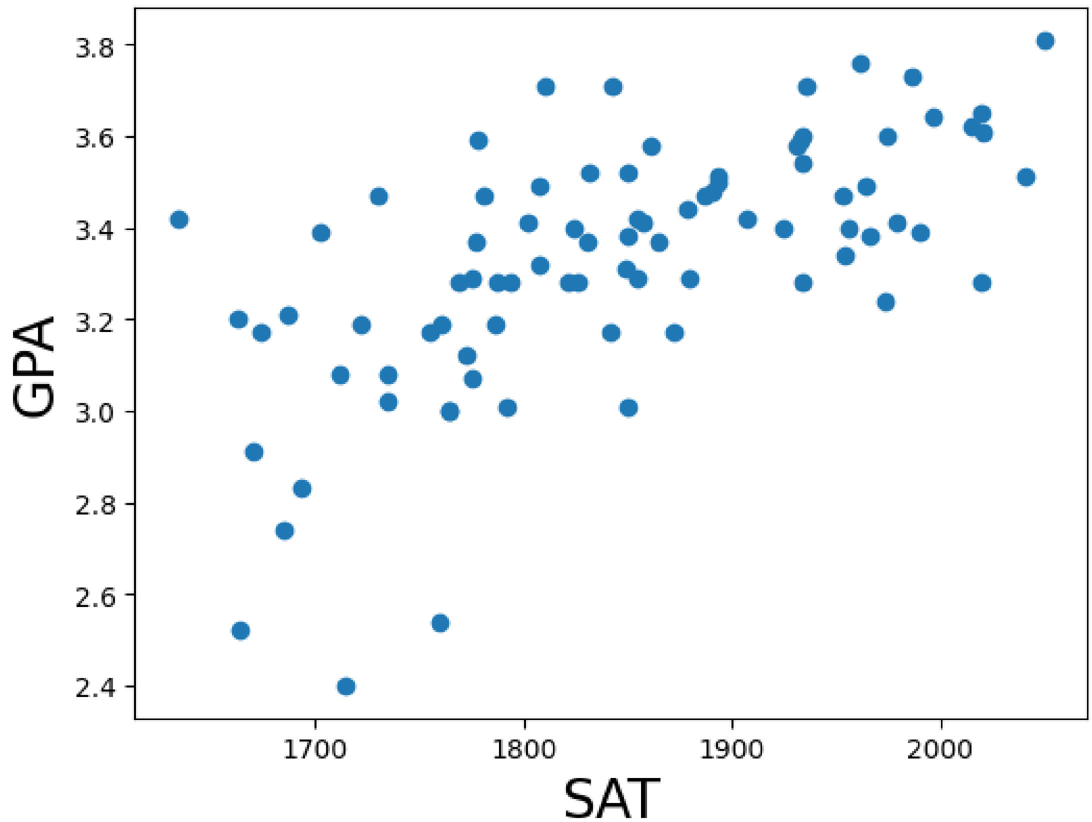
[6]:
```python
data.describe()
```

[6]:
```
               SAT        GPA
count    84.000000  84.000000
mean   1845.273810   3.330238
std     104.530661   0.271617
min    1634.000000   2.400000
25%    1772.000000   3.190000
50%    1846.000000   3.380000
75%    1934.000000   3.502500
max    2050.000000   3.810000
```

[7]:
```python
y = data['GPA']
x1 = data['SAT']
```

[8]:

```
plt.scatter(x1,y)
plt.xlabel('SAT',fontsize=20)
plt.ylabel('GPA',fontsize=20)
plt.show()
```



[9]:

```
x = sm.add_constant(x1)
result = sm.OLS(y,x).fit()
result.summary()
```

[9]:

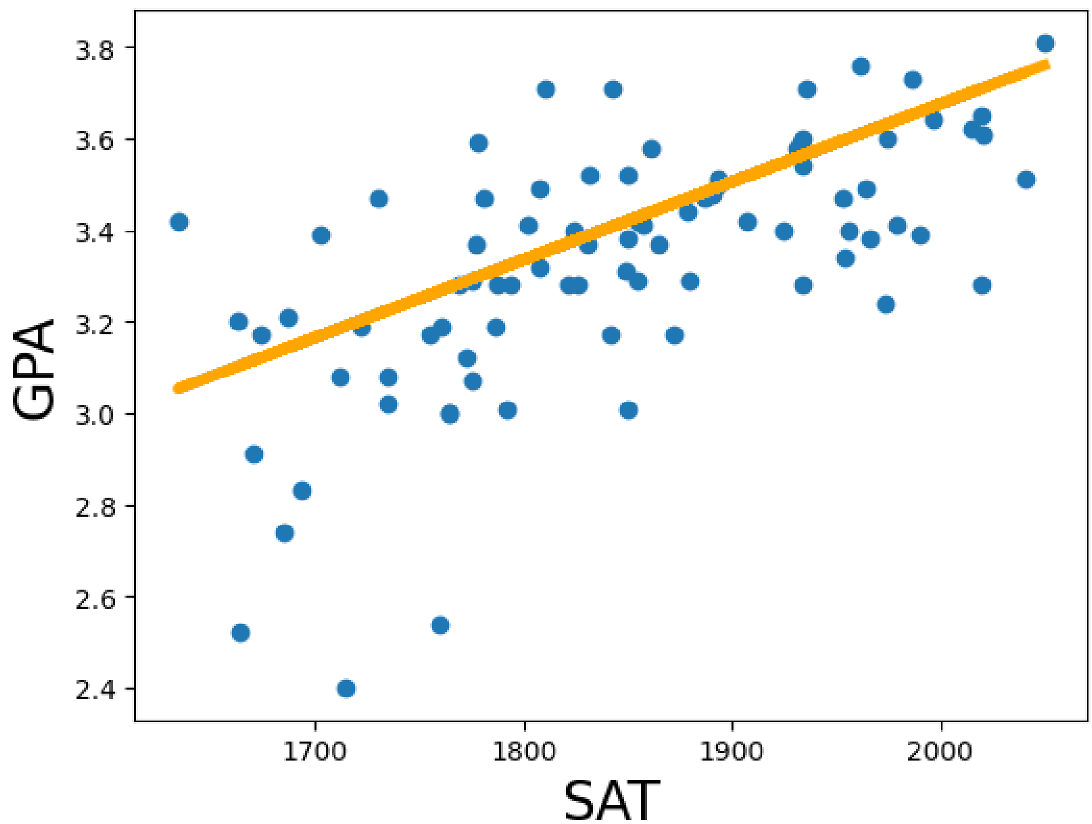
Dep. Variable:	GPA	**R-squared:**	0.406
Model:	OLS	**Adj. R-squared:**	0.399
Method:	Least Squares	**F-statistic:**	56.05
Date:	Tue, 08 Jul 2025	**Prob (F-statistic):**	7.20e-11
Time:	16:03:54	**Log-Likelihood:**	12.672
No. Observations:	84	**AIC:**	-21.34
Df Residuals:	82	**BIC:**	-16.48
Df Model:	1		
Covariance Type:	nonrobust		

	coef	std err	t	P> |t|	[0.025	0.975]
const	0.2750	0.409	0.673	0.503	-0.538	1.088
SAT	0.0017	0.000	7.487	0.000	0.001	0.002

Omnibus:	12.839	**Durbin-Watson:**	0.950
Prob(Omnibus):	0.002	**Jarque-Bera (JB):**	16.155
Skew:	-0.722	**Prob(JB):**	0.000310
Kurtosis:	4.590	**Cond. No.**	3.29e+04

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
[2] The condition number is large, 3.29e+04. This might indicate that there are strong multicollinearity or other numerical problems.

[12]:
```
plt.scatter(x1,y)
yhat = 0.0017*x1 + 0.275
fig = plt.plot(x1,yhat, lw=4, c='orange', label ='regression line')
plt.xlabel('SAT', fontsize = 20)
plt.ylabel('GPA', fontsize = 20)
plt.show()
```



```
[ ]:
```