In [1]:
```
import numpy as np #works with multidimensional arrays
import pandas as pd #format the data into columns and rows
import matplotlib.pyplot as plt #2d visualization
import statsmodels.api as sm #summaries
import seaborn #nice graphs
seaborn.set()
```

In [2]:
```
data = pd.read_csv('1.02. Multiple linear regression.csv')
```

In [3]:
```
data
```

Out[3]:

| | SAT | GPA | Rand 1,2,3 |
|---|---|---|---|
| **0** | 1714 | 2.40 | 1 |
| **1** | 1664 | 2.52 | 3 |
| **2** | 1760 | 2.54 | 3 |
| **3** | 1685 | 2.74 | 3 |
| **4** | 1693 | 2.83 | 2 |
| **...** | ... | ... | ... |
| **79** | 1936 | 3.71 | 3 |
| **80** | 1810 | 3.71 | 1 |
| **81** | 1987 | 3.73 | 3 |
| **82** | 1962 | 3.76 | 1 |
| **83** | 2050 | 3.81 | 2 |

84 rows × 3 columns

In [4]:
```
data.describe()
```

Out[4]:

| | SAT | GPA | Rand 1,2,3 |
|---|---|---|---|
| **count** | 84.000000 | 84.000000 | 84.000000 |
| **mean** | 1845.273810 | 3.330238 | 2.059524 |
| **std** | 104.530661 | 0.271617 | 0.855192 |
| **min** | 1634.000000 | 2.400000 | 1.000000 |
| **25%** | 1772.000000 | 3.190000 | 1.000000 |
| **50%** | 1846.000000 | 3.380000 | 2.000000 |
| **75%** | 1934.000000 | 3.502500 | 3.000000 |
| **max** | 2050.000000 | 3.810000 | 3.000000 |

In [7]:
```
y = data['GPA']
x1 = data[['SAT', 'Rand 1,2,3']]
```

In [8]:
```
x = sm.add_constant(x1)
results = sm.OLS(y,x).fit()
```

In [9]:
```
results.summary()
```

Out[9]:

OLS Regression Results

| | | | |
|---|---|---|---|
| **Dep. Variable:** | GPA | **R-squared:** | 0.407 |
| **Model:** | OLS | **Adj. R-squared:** | 0.392 |
| **Method:** | Least Squares | **F-statistic:** | 27.76 |
| **Date:** | Wed, 25 Aug 2021 | **Prob (F-statistic):** | 6.58e-10 |
| **Time:** | 21:17:30 | **Log-Likelihood:** | 12.720 |
| **No. Observations:** | 84 | **AIC:** | -19.44 |
| **Df Residuals:** | 81 | **BIC:** | -12.15 |
| **Df Model:** | 2 | | |
| **Covariance Type:** | nonrobust | | |

| | coef | std err | t | P>\|t\| | [0.025 | 0.975] |
|---|---|---|---|---|---|---|
| **const** | 0.2960 | 0.417 | 0.710 | 0.480 | -0.533 | 1.125 |

In [ ]:
```
```