Coding Projects - Part 5

Covariance & Correlation

- Calculate and interpret the Covariance and the Correlation Coefficient between Budget and Revenue for Movies that were released in 2016.
- Test whether the Correlation Coefficient is significantly different from zero (5% level of significance).
- Visualize the relationship between Budget and Revenue.

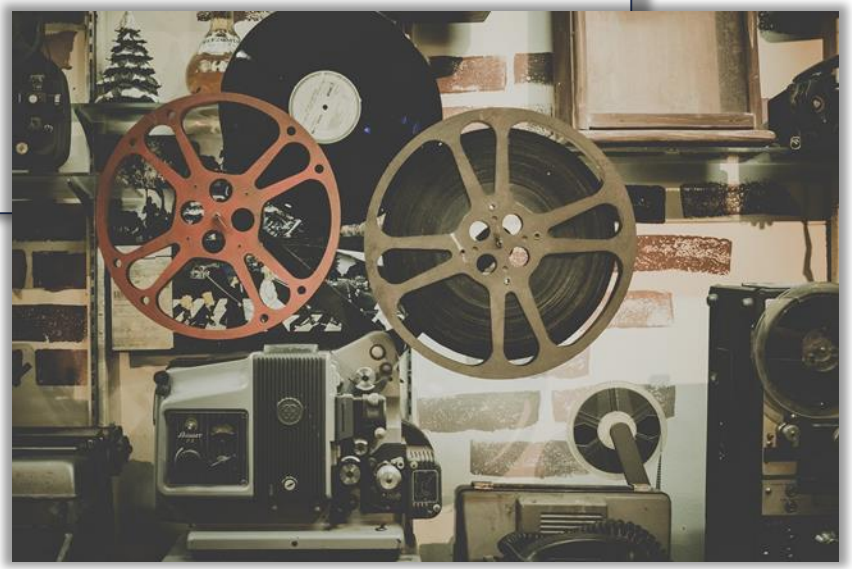
OLS Regression and ANOVA

- Create a simple Linear Regression Model between Budget (independent variable) and Revenue (dependent Variable) for Movies that were released in 2016. Calculate & interpret Regression Coefficients.
- Perform an Analysis of Variance (ANOVA) and calculate and interpret the Coefficient of Determination.
- Perform Hypothesis Tests (two-sided) on Intercept and Slope (1% level of significance). Is the feature Budget statistically significant?

Multiple Regression

Create a Multiple Regression Model explaining the dependent variable Revenue for Movies that were released between 2010 and 2016.

- Create/Engineer features (e.g. dummy variables) and drop non-significant features (Model Specification)
- Determine the model´s goodness of fit
- Perform and interpret an F-Test



Application in Finance: Fama-French Factor Models

Create and interpret the following regression models for Microsoft (MSFT) using daily returns between 2016 and 2018:

- Single-Factor Model / CAPM
- Fama-French Three-Factor Model
- Fama-French Five-Factor Model

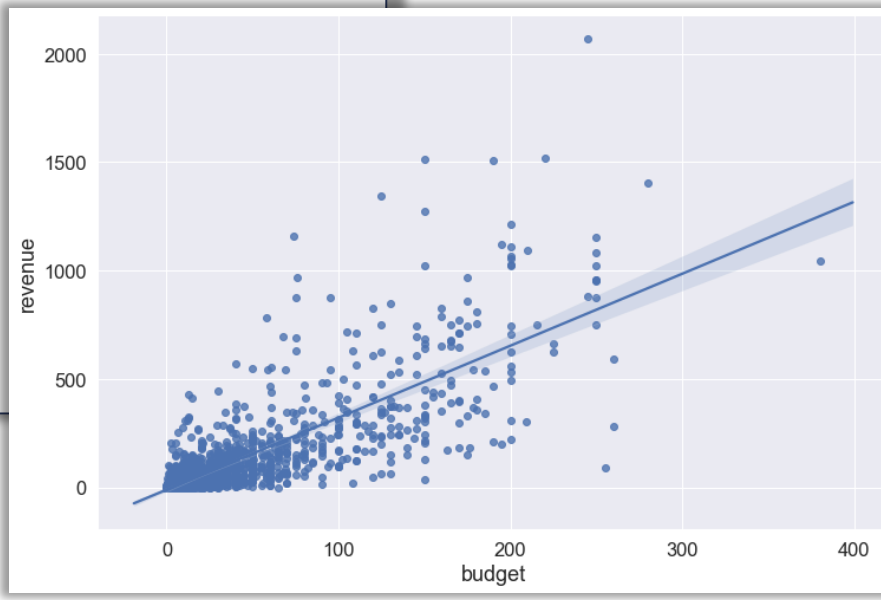
Which Factors significantly explain Microsoft Returns (1% level of significance)?

Calculate Alpha and test whether Alpha is statistically significant.

Issues in Regression Analysis

Detect and handle / correct the following Issues in Linear Regression Models:

- Outliers
- Non-Linear Relationships
- Multicollinearity
- Heteroskedasticity
- Serial Correlation (Autocorrelation)



Logistic Regression

Create a Logistic Regression Model and determine the Factors that significantly influenced the probability to survive the Titanic Disaster (1% level of significance).