# Project1_Base_VICK

August 23, 2024

## 1 Box Office (1999-2019) Data Visualization

[1]:

```
from pathlib import Path
import pandas as pd
import scipy.stats as stats
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from scipy.stats import linregress
```

### 1.1 Data Frame

[2]:

```
# Filepath
filepath = "random_v3_df.csv"

# Read the CSV file, converting relevant columns to correct data types
df = pd.read_csv(filepath)
df.shape
```

[2]:

```
(2276, 10)
```

[3]:

```
df.head()
```

[3]:

```
                            title_without_year  year main_genre MPAA-Rating  \
0                            Avengers: Endgame  2019     Action       PG-13   
1                                       Avatar  2009     Sci-Fi       PG-13   
2  Star Wars: Episode VII - The Force Awakens  2015     Sci-Fi       PG-13   
3                               Jurassic World  2015  Adventure       PG-13   
4                                The Lion King  2019     Family          PG   

   Runtime                          Distributor     Budget_$   Domestic_$  \
0      181  Walt Disney Studios Motion Pictures  $356,000,000  $858,373,000   
1      162                 Twentieth Century Fox  $237,000,000  $749,766,139   
2      138  Walt Disney Studios Motion Pictures  $245,000,000  $936,662,225   
3      124                    Universal Pictures  $150,000,000  $652,270,625   
4      118  Walt Disney Studios Motion Pictures  $260,000,000  $543,638,043   
```

```
   International_$ total_revenue_$
0   $1,939,128,328   $2,797,501,328
1   $1,993,811,448   $2,743,577,587
2   $1,131,561,399   $2,068,223,624
3   $1,018,130,012   $1,670,400,637
4   $1,113,305,351   $1,656,943,394
```

[4]:

```
df["main_genre"].value_counts()
```

[4]:

```
main_genre
Comedy          385
Drama           374
Thriller        223
Action          207
Romance         156
Adventure       155
Sci-Fi          111
Crime           103
Fantasy          99
Family           84
Horror           82
Mystery          74
Biography        51
Animation        37
Music            31
History          25
War              22
Sport            21
Western          13
Musical          12
Documentary      11
Name: count, dtype: int64
```

[5]:

```
# Create Profit Column
# Convert `Budget_$` and `total_revenue_$` columns to numeric, after removing␣
 ↪'$' and ','
df['Budget_$'] = df['Budget_$'].astype(str).str.replace(r'[$,]', '', regex=True)
df['total_revenue_$'] = df['total_revenue_$'].astype(str).str.replace(r'[$,]',␣
 ↪'', regex=True)
df['Budget_$'] = pd.to_numeric(df['Budget_$'])
df['total_revenue_$'] = pd.to_numeric(df['total_revenue_$'])

# Calculate Profit
df['profit'] = df['total_revenue_$'] - df['Budget_$']
```

## 1.2 Regression Model: All Genres

[6]:

```python
# Define linear regression model
def create_linear_regression_plot(df, x_col, y_col, x_label, y_label, title):
    # Perform linear regression
    slope, intercept, r_value, p_value, std_err = linregress(df[x_col], df[y_col])

    # Find movie with highest and lowest profit
    highest_profit_movie_index = df[y_col].idxmax()
    highest_profit_movie = df.loc[highest_profit_movie_index, 'title_without_year']
    highest_profit_year = df.loc[highest_profit_movie_index, 'year']
    highest_profit = df[y_col].max() / 1_000_000_000

    filtered_df = df[df['title_without_year'] != highest_profit_movie]
    lowest_profit_movie_index = filtered_df[y_col].idxmin()
    lowest_profit_movie = filtered_df.loc[lowest_profit_movie_index, 'title_without_year']
    lowest_profit_year = filtered_df.loc[lowest_profit_movie_index, 'year']
    lowest_profit = filtered_df[y_col].min() / 1_000_000

    # Create scatter plot, keeping x-values in millions and converting y-values to billions
    plt.figure(figsize=(10, 6))
    plt.scatter(df[x_col] / 1_000_000, df[y_col] / 1_000_000_000, s=100, color='#277DA1', label='Data Points', edgecolors='black', linewidths=0.5)

    # Add linear regression line
    plt.plot(df[x_col] / 1_000_000, (slope * df[x_col] + intercept) / 1_000_000_000, color='#F94144', label='Linear Regression', linewidth=3)

    # Equation annotation
    plt.annotate(f'y = {slope:.2f}x + {intercept / 1_000:.2f}',
                 xy=(df[x_col].min() / 1_000_000, df[y_col].max() / 1_000_000_000),
                 xytext=(20, -20),
                 textcoords='offset points',
                 color='#F94144',
                 fontsize=18,
                 bbox=dict(boxstyle="round,pad=0.3", fc="white", ec="gray", lw=0.7))

    # Labels and title
    plt.xlabel(f'{x_label} (Millions)', fontsize=16)
    plt.ylabel(f'{y_label} (Billions)', fontsize=16)
    plt.title(title, fontsize=18)
    # Add gridlines
    plt.grid(axis='both', linestyle='--')

    # Display r-squared value
    print(f"The r-squared is: {r_value**2}")

    # Print highest and lowest profit movies
    print("\nHighest Profit:")
    print(f"- Title: {highest_profit_movie}({highest_profit_year})")
    highest_profit_budget = df.loc[highest_profit_movie_index, 'Budget_$'] / 1_000_000
    print(f"- Budget: ${highest_profit_budget:.2f} Million")

    highest_profit_revenue = df.loc[highest_profit_movie_index, 'total_revenue_$']

    # Format revenue dynamically
    if highest_profit_revenue >= 1_000_000_000:  # Check if over 1 billion
        highest_profit_revenue /= 1_000_000_000
        print(f"- Revenue: ${highest_profit_revenue:.2f} Billion")
    else:
        highest_profit_revenue /= 1_000_000
        print(f"- Revenue: ${highest_profit_revenue:.2f} Million")

    if highest_profit >= 1:
        print(f"- Profit: ${highest_profit:.2f} Billion")
    else:
        highest_profit_millions = highest_profit * 1000
        print(f"- Profit: ${highest_profit_millions:.2f} Million")


    print("\nBiggest Flop:")
    print(f"- Title: {lowest_profit_movie}({lowest_profit_year})")
    lowest_profit_budget = df.loc[lowest_profit_movie_index, 'Budget_$'] / 1_000_000
    print(f"- Budget: ${lowest_profit_budget:.2f} Million")

    lowest_profit_revenue = df.loc[lowest_profit_movie_index, 'total_revenue_$']

    # Format revenue dynamically
    if lowest_profit_revenue >= 1_000_000_000:
        lowest_profit_revenue /= 1_000_000_000
        print(f"- Revenue: ${lowest_profit_revenue:.2f} Billion")
    else:
        lowest_profit_revenue /= 1_000_000
        print(f"- Revenue: ${lowest_profit_revenue:.2f} Million")
```

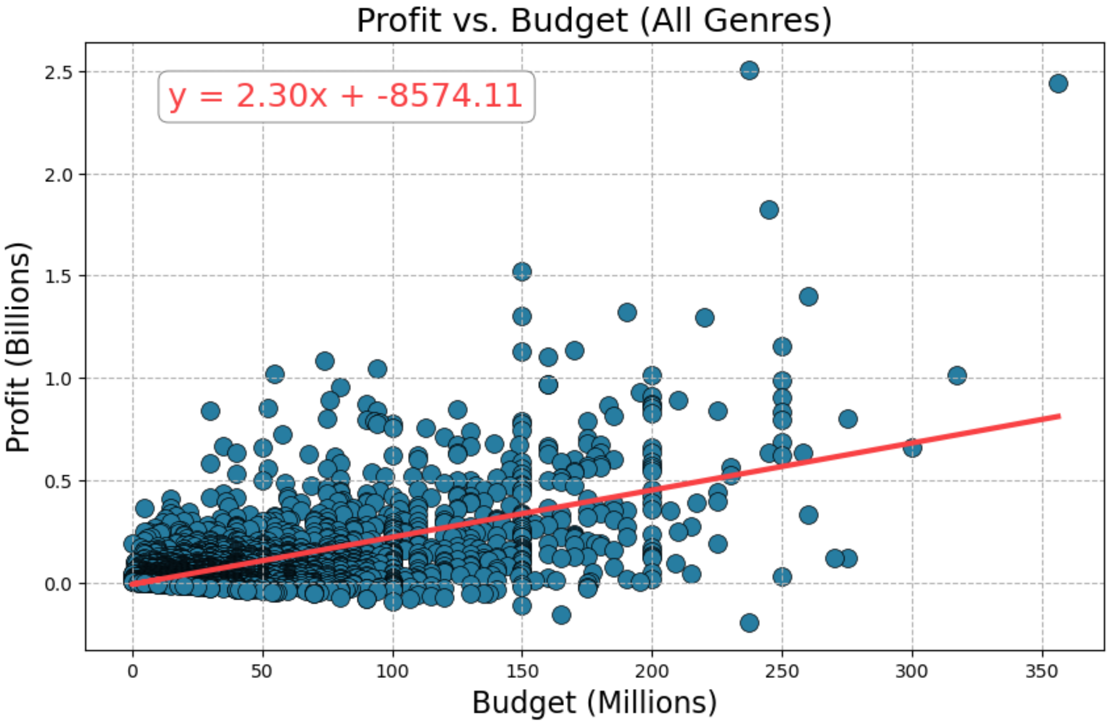
```
print(f"- Loss: ${-lowest_profit:.2f} Million")

# Find highest and lowest budget movies
highest_budget_index = df['Budget_$'].idxmax()
highest_budget_movie = df.loc[highest_budget_index, 'title_without_year']
highest_budget_year = df.loc[highest_budget_index, 'year']
highest_budget = df['Budget_$'].max() / 1_000_000

lowest_budget_index = df['Budget_$'].idxmin()
lowest_budget_movie = df.loc[lowest_budget_index, 'title_without_year']
lowest_budget_year = df.loc[lowest_budget_index, 'year']
lowest_budget = df['Budget_$'].min() / 1_000_000

# Print highest and lowest budget movies with revenue and profit
print("\nHighest Budget:")
print(f"- Title: {highest_budget_movie}({highest_budget_year})")
print(f"- Budget: ${highest_budget:.2f} Million")
highest_budget_revenue = df.loc[highest_budget_index, 'total_revenue_$']

# Format revenue dynamically
if highest_budget_revenue >= 1_000_000_000:
    highest_budget_revenue /= 1_000_000_000
    print(f"- Revenue: ${highest_budget_revenue:.2f} Billion")
else:
    highest_budget_revenue /= 1_000_000
    print(f"- Revenue: ${highest_budget_revenue:.2f} Million")

highest_budget_profit = df.loc[highest_budget_index, y_col] / 1_000_000_000
if highest_budget_profit >= 1:
    print(f"- Profit: ${highest_budget_profit:.2f} Billion")
else:
    highest_budget_profit_millions = highest_budget_profit * 1000
    print(f"- Profit: ${highest_budget_profit_millions:.2f} Million")

print("\nLowest Budget:")
print(f"- Title: {lowest_budget_movie}({lowest_budget_year})")

# Retrieve and format lowest budget
lowest_budget = df.loc[lowest_budget_index, 'Budget_$']
if lowest_budget >= 1_000_000:
    lowest_budget /= 1_000_000
    print(f"- Budget: ${lowest_budget:.2f} Million")
else:
    lowest_budget /= 1_000
    print(f"- Budget: ${lowest_budget:.2f} Thousand")
```

```python
    # Ensure lowest_budget_revenue is always assigned
    lowest_budget_revenue = df.loc[lowest_budget_index, 'total_revenue_$']

    # Format revenue dynamically
    if lowest_budget_revenue >= 1_000_000_000:
        lowest_budget_revenue /= 1_000_000_000
        print(f"- Revenue: ${lowest_budget_revenue:.2f} Billion")
    else:
        lowest_budget_revenue /= 1_000_000
        print(f"- Revenue: ${lowest_budget_revenue:.2f} Million")

    lowest_budget_profit = df.loc[lowest_budget_index, y_col] / 1_000_000_000
    if lowest_budget_profit >= 1:
        print(f"- Profit: ${lowest_budget_profit:.2f} Billion")
    else:
        lowest_budget_profit_millions = lowest_budget_profit * 1000
        print(f"- Profit: ${lowest_budget_profit_millions:.2f} Million")

    # Show plot
    plt.show()
```

[7]:

```python
# Call the function
create_linear_regression_plot(df, 'Budget_$', 'profit', 'Budget', 'Profit',␣
 ↪'Profit vs. Budget (All Genres)')
```

```
The r-squared is: 0.3448866008133383

Highest Profit:
- Title: Avatar (2009)
- Budget: $237.00 Million
- Revenue: $2.74 Billion
- Profit: $2.51 Billion

Biggest Flop:
- Title: The Polar Express (2005)
- Budget: $165.00 Million
- Revenue: $11.91 Million
- Loss: $153.09 Million

Highest Budget:
- Title: Avengers: Endgame (2019)
- Budget: $356.00 Million
- Revenue: $2.80 Billion
- Profit: $2.44 Billion

Lowest Budget:
- Title: Paranormal Activity (2009)
- Budget: $15.00 Thousand
- Revenue: $193.36 Million
- Profit: $193.34 Million
```



**Analysis: When we analyze every movie across the board, the data shows us that a movie's budget is approximately 35% the reason behind its success.**

### 1.3 Regression Models: Individual Genres

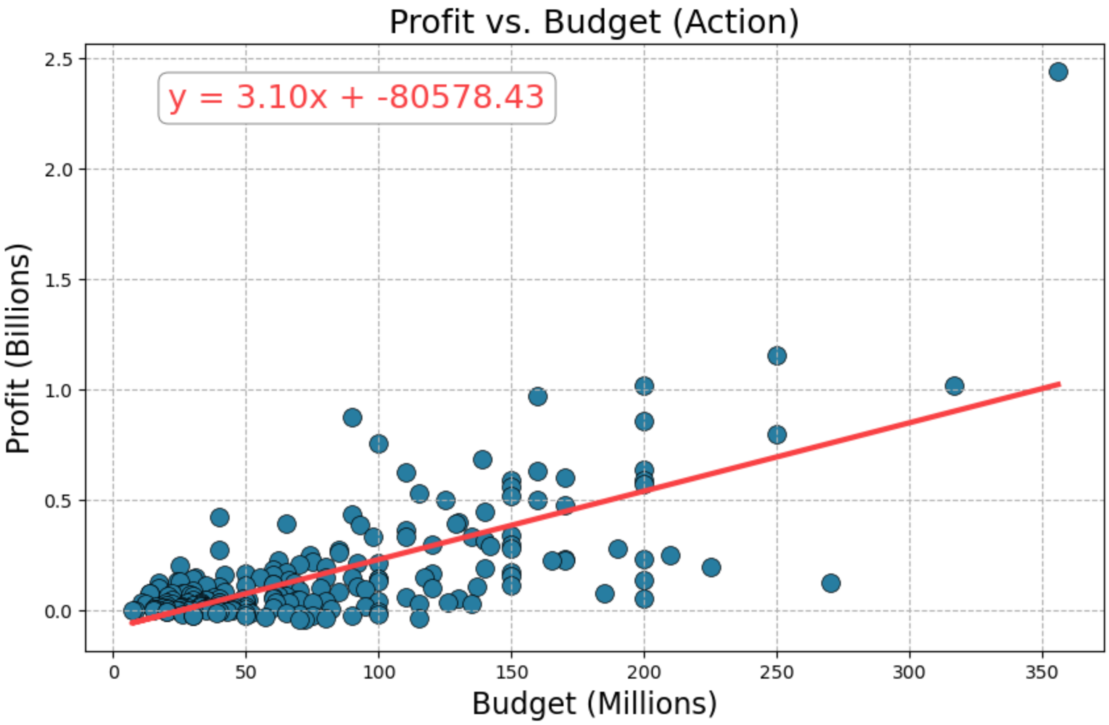
[8]:
```
def create_linear_regression_plot_genre(df, x_col, y_col, x_label, y_label,␣
↪title, genre_filter):
    # Filter for the specified genre from 'main_genre' column
    genre_df = df[df['main_genre'] == genre_filter]

    # Perform linear regression on the filtered data
    slope, intercept, r_value, p_value, std_err = linregress(genre_df[x_col],␣
↪genre_df[y_col])

    # Find movie with highest and lowest profit
    highest_profit_movie_index = genre_df[y_col].idxmax()
    highest_profit_movie = genre_df.loc[highest_profit_movie_index,␣
↪'title_without_year']
    highest_profit_year = genre_df.loc[highest_profit_movie_index, 'year']
    highest_profit = genre_df[y_col].max() / 1_000_000_000
    filtered_df = genre_df[genre_df['title_without_year'] !=␣
↪highest_profit_movie]
    lowest_profit_movie_index = filtered_df[y_col].idxmin()
    lowest_profit_movie = filtered_df.loc[lowest_profit_movie_index,␣
↪'title_without_year']
    lowest_profit_year = filtered_df.loc[lowest_profit_movie_index, 'year']
    lowest_profit = filtered_df[y_col].min() / 1_000_000

    # Create scatter plot, keeping x-values in millions and converting y-values␣
↪to billions
    plt.figure(figsize=(10, 6))
    plt.scatter(genre_df[x_col] / 1_000_000, genre_df[y_col] / 1_000_000_000,␣
↪s=100, color='#277DA1', label='Data Points', edgecolors='black',␣
↪linewidths=0.5)

    # Add linear regression line
    plt.plot(genre_df[x_col] / 1_000_000, (slope * genre_df[x_col] + intercept)␣
↪/ 1_000_000_000, color='#F94144', label='Linear Regression', linewidth=3)

    # Equation annotation
    plt.annotate(f'y = {slope:.2f}x + {intercept / 1_000:.2f}',
                 xy=(genre_df[x_col].min() / 1_000_000, genre_df[y_col].max() /␣
↪1_000_000_000),
                 xytext=(20, -20),
                 textcoords='offset points',
                 color='#F94144',
                 fontsize=18,
                 bbox=dict(boxstyle="round,pad=0.3", fc="white", ec="gray",␣
↪lw=0.7))

    # Labels and title
    plt.xlabel(f'{x_label} (Millions)', fontsize=16)
    plt.ylabel(f'{y_label} (Billions)', fontsize=16)
    plt.title(f'{title} ({genre_filter})', fontsize=18)  # Dynamically include␣
↪genre_filter in title

    # Add gridlines
    plt.grid(axis='both', linestyle='--')

    # Display r-squared value
    print(f"The r-squared is: {r_value**2}")

    # Print highest and lowest profit movies
    print("\nHighest Profit:")
    print(f"- Title: {highest_profit_movie}({highest_profit_year})")
    highest_profit_budget = df.loc[highest_profit_movie_index, 'Budget_$'] /␣
↪1_000_000
    print(f"- Budget: ${highest_profit_budget:.2f} Million")

    highest_profit_revenue = df.loc[highest_profit_movie_index,␣
↪'total_revenue_$']

    # Format revenue dynamically
    if highest_profit_revenue >= 1_000_000_000:  # Check if over 1 billion
        highest_profit_revenue /= 1_000_000_000
        print(f"- Revenue: ${highest_profit_revenue:.2f} Billion")
    else:
        highest_profit_revenue /= 1_000_000
        print(f"- Revenue: ${highest_profit_revenue:.2f} Million")

    if highest_profit >= 1:
        print(f"- Profit: ${highest_profit:.2f} Billion")
    else:
        highest_profit_millions = highest_profit * 1000
        print(f"- Profit: ${highest_profit_millions:.2f} Million")


    print("\nBiggest Flop:")
    print(f"- Title: {lowest_profit_movie}({lowest_profit_year})")
    lowest_profit_budget = df.loc[lowest_profit_movie_index, 'Budget_$'] /␣
↪1_000_000
    print(f"- Budget: ${lowest_profit_budget:.2f} Million")

    lowest_profit_revenue = df.loc[lowest_profit_movie_index, 'total_revenue_$']

    # Format revenue dynamically
    if lowest_profit_revenue >= 1_000_000_000:
        lowest_profit_revenue /= 1_000_000_000
        print(f"- Revenue: ${lowest_profit_revenue:.2f} Billion")
    else:
        lowest_profit_revenue /= 1_000_000
        print(f"- Revenue: ${lowest_profit_revenue:.2f} Million")

    print(f"- Loss: ${-lowest_profit:.2f} Million")

    # Find highest and lowest budget movies within the filtered genre
    highest_budget_movie_index = genre_df['Budget_$'].idxmax()
    lowest_budget_movie_index = genre_df['Budget_$'].idxmin()

    # Print Highest Budget Movie details
    print("\nHighest Budget:")
    print(f"- Title: {genre_df.loc[highest_budget_movie_index,␣
↪'title_without_year']}({genre_df.loc[highest_budget_movie_index, 'year']})")
    print(f"- Budget: ${genre_df.loc[highest_budget_movie_index, 'Budget_$'] /␣
↪1_000_000:.2f} Million")

    # Calculate and print revenue
    highest_budget_revenue = genre_df.loc[highest_budget_movie_index,␣
↪'total_revenue_$']
    if highest_budget_revenue >= 1_000_000_000:
        highest_budget_revenue /= 1_000_000_000
        print(f"- Revenue: ${highest_budget_revenue:.2f} Billion")
    else:
        highest_budget_revenue /= 1_000_000
        print(f"- Revenue: ${highest_budget_revenue:.2f} Million")

    # Calculate and print profit
    highest_budget_profit = (genre_df.loc[highest_budget_movie_index,␣
↪'total_revenue_$'] - genre_df.loc[highest_budget_movie_index, 'Budget_$'])
    if highest_budget_profit >= 1_000_000_000:
        highest_budget_profit /= 1_000_000_000
        print(f"- Profit: ${highest_budget_profit:.2f} Billion")
    else:
        highest_budget_profit /= 1_000_000
        print(f"- Profit: ${highest_budget_profit:.2f} Million")

    # Print Lowest Budget Movie details
    print("\nLowest Budget:")
    print(f"- Title: {genre_df.loc[lowest_budget_movie_index,␣
↪'title_without_year']}({genre_df.loc[lowest_budget_movie_index, 'year']})")
    lowest_budget = genre_df.loc[lowest_budget_movie_index, 'Budget_$']

    if lowest_budget < 1_000_000:
        print(f"- Budget: ${lowest_budget / 1_000:.2f} Thousand")
    else:
        print(f"- Budget: ${lowest_budget / 1_000_000:.2f} Million")

    lowest_budget_revenue = genre_df.loc[lowest_budget_movie_index,␣
↪'total_revenue_$']

    # Format revenue
    if lowest_budget_revenue >= 1_000_000_000:
        lowest_budget_revenue /= 1_000_000_000
        print(f"- Revenue: ${lowest_budget_revenue:.2f} Billion")
    else:
        lowest_budget_revenue /= 1_000_000
        print(f"- Revenue: ${lowest_budget_revenue:.2f} Million")
    # Calculate profit/loss
    lowest_budget_profit_loss = (genre_df.loc[lowest_budget_movie_index,␣
↪'total_revenue_$'] - genre_df.loc[lowest_budget_movie_index, 'Budget_$'])

    # Conditional formatting for profit/loss
    if lowest_budget_profit_loss >= 0:
        label = "Profit:"
        if lowest_budget_profit_loss >= 1_000_000:
            lowest_budget_profit_loss /= 1_000_000
            unit = " Million"
        else:
            lowest_budget_profit_loss /= 1_000
            unit = " Thousand"
    else:
        label = "Loss:"
        lowest_budget_profit_loss = abs(lowest_budget_profit_loss)
        if lowest_budget_profit_loss >= 1_000_000:
            lowest_budget_profit_loss /= 1_000_000
            unit = " Million"
        else:
            lowest_budget_profit_loss /= 1_000
            unit = " Thousand"
    print(f"- {label} ${lowest_budget_profit_loss:.2f}{unit}")

    # Show plot
    plt.show()
```

### 1.3.1 Action

[9]:
```
# Call the function with the desired genre
create_linear_regression_plot_genre(df, 'Budget_$', 'profit', 'Budget',␣
↪'Profit', 'Profit vs. Budget', 'Action')
```

```
The r-squared is: 0.49024371214819723

Highest Profit:
- Title: Avengers: Endgame (2019)
- Budget: $356.00 Million
- Revenue: $2.80 Billion
- Profit: $2.44 Billion

Biggest Flop:
- Title: The Last Castle (2001)
- Budget: $72.00 Million
- Revenue: $27.64 Million
- Loss: $44.36 Million
```

```
Highest Budget:
- Title: Avengers: Endgame (2019)
- Budget: $356.00 Million
- Revenue: $2.80 Billion
- Profit: $2.44 Billion

Lowest Budget:
- Title: Pootie Tang (2001)
- Budget: $7.00 Million
- Revenue: $6.63 Million
- Loss: $372.83 Thousand
```

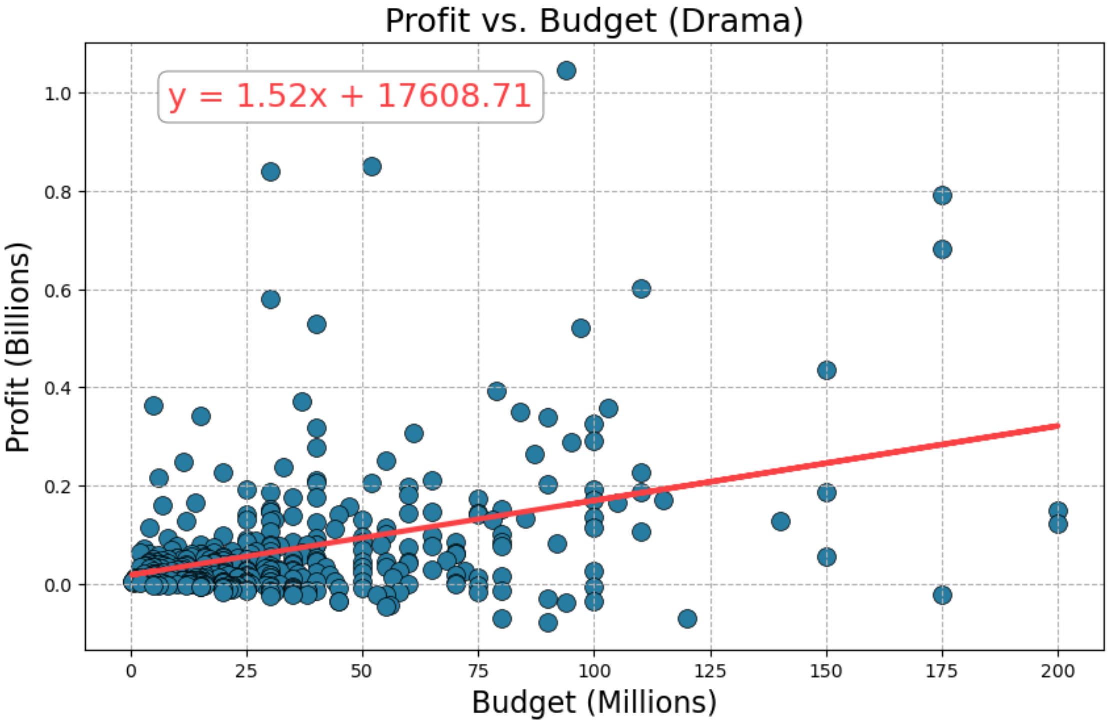


**Analysis: Action movies have whopping 0.49 r-squared value meaning that an action movie's success is highly dependant on its budget.**

### 1.3.2 Drama

[10]:
```
create_linear_regression_plot_genre(df, 'Budget_$', 'profit', 'Budget',␣
↪'Profit', 'Profit vs. Budget', 'Drama')
```

```
The r-squared is: 0.1536530870897737

Highest Profit:
- Title: The Lord of the Rings: The Return of the King (2003)
- Budget: $94.00 Million
- Revenue: $1.14 Billion
- Profit: $1.05 Billion

Biggest Flop:
- Title: The Promise (2017)
- Budget: $90.00 Million
- Revenue: $12.45 Million
- Loss: $77.55 Million

Highest Budget:
- Title: Titanic (2012)
- Budget: $200.00 Million
- Revenue: $350.45 Million
- Profit: $150.45 Million

Lowest Budget:
- Title: Sleight (2017)
- Budget: $250.00 Thousand
- Revenue: $3.99 Million
- Profit: $3.74 Million
```

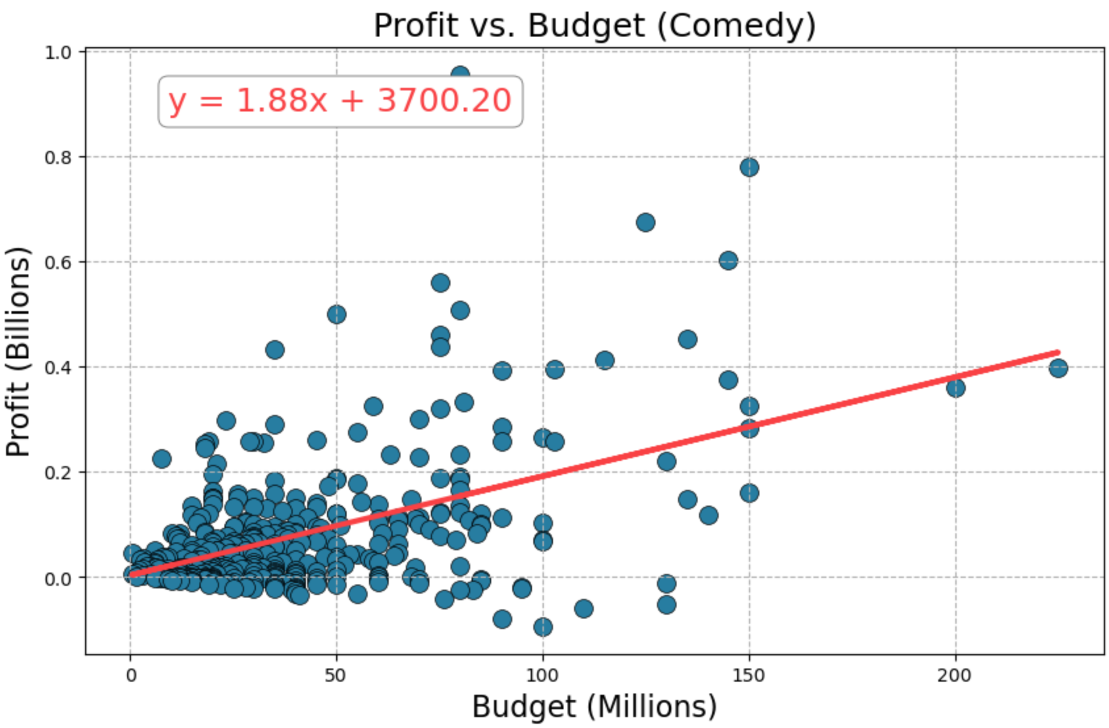


**Analysis: A dramatic movie's success seems to be less dependant on its budget as its r-squared value is only 0.15.**

### 1.3.3 Comedy

```
[11]: create_linear_regression_plot_genre(df, 'Budget_$', 'profit', 'Budget',␣
       ↪'Profit', 'Profit vs. Budget', 'Comedy')
```

```
The r-squared is: 0.24981478020975345

Highest Profit:
- Title: Despicable Me 3 (2017)
- Budget: $80.00 Million
- Revenue: $1.03 Billion
- Profit: $954.80 Million

Biggest Flop:
- Title: The Adventures of Pluto Nash (2002)
- Budget: $100.00 Million
- Revenue: $7.10 Million
- Loss: $92.90 Million

Highest Budget:
- Title: Men in Black 3 (2012)
- Budget: $225.00 Million
- Revenue: $624.03 Million
- Profit: $399.03 Million

Lowest Budget:
- Title: Napoleon Dynamite (2004)
- Budget: $400.00 Thousand
- Revenue: $46.12 Million
- Profit: $45.72 Million
```

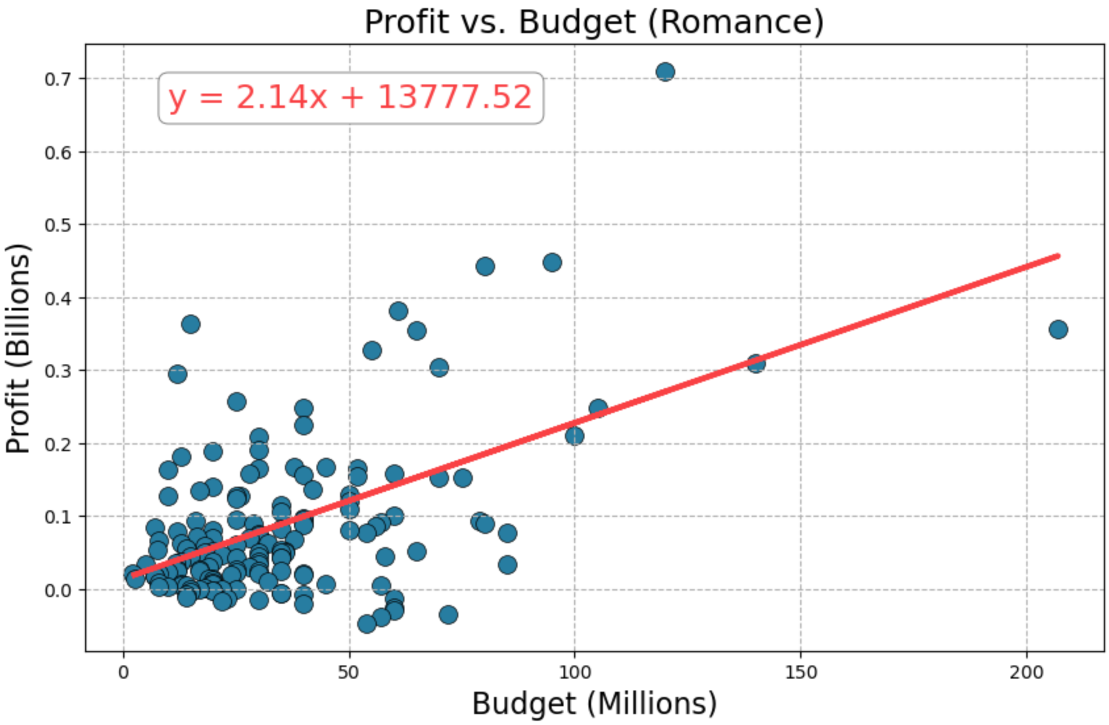


**Analysis: Comedies are moderately higher than dramas, but other major factors are still at play for their success.**

### 1.3.4 Romance

```
[12]: create_linear_regression_plot_genre(df, 'Budget_$', 'profit', 'Budget',␣
      ↪'Profit', 'Profit vs. Budget', 'Romance')
```

```
The r-squared is: 0.246907186996l0936

Highest Profit:
- Title: The Twilight Saga: Breaking Dawn - Part 2 (2012)
- Budget: $120.00 Million
- Revenue: $829.75 Million
- Profit: $709.75 Million

Biggest Flop:
- Title: Gigli (2003)
- Budget: $54.00 Million
- Revenue: $7.27 Million
- Loss: $46.73 Million

Highest Budget:
- Title: King Kong (2005)
- Budget: $207.00 Million
- Revenue: $562.36 Million
- Profit: $355.36 Million

Lowest Budget:
- Title: Boys Don't Cry (1999)
- Budget: $2.00 Million
- Revenue: $23.08 Million
- Profit: $21.08 Million
```



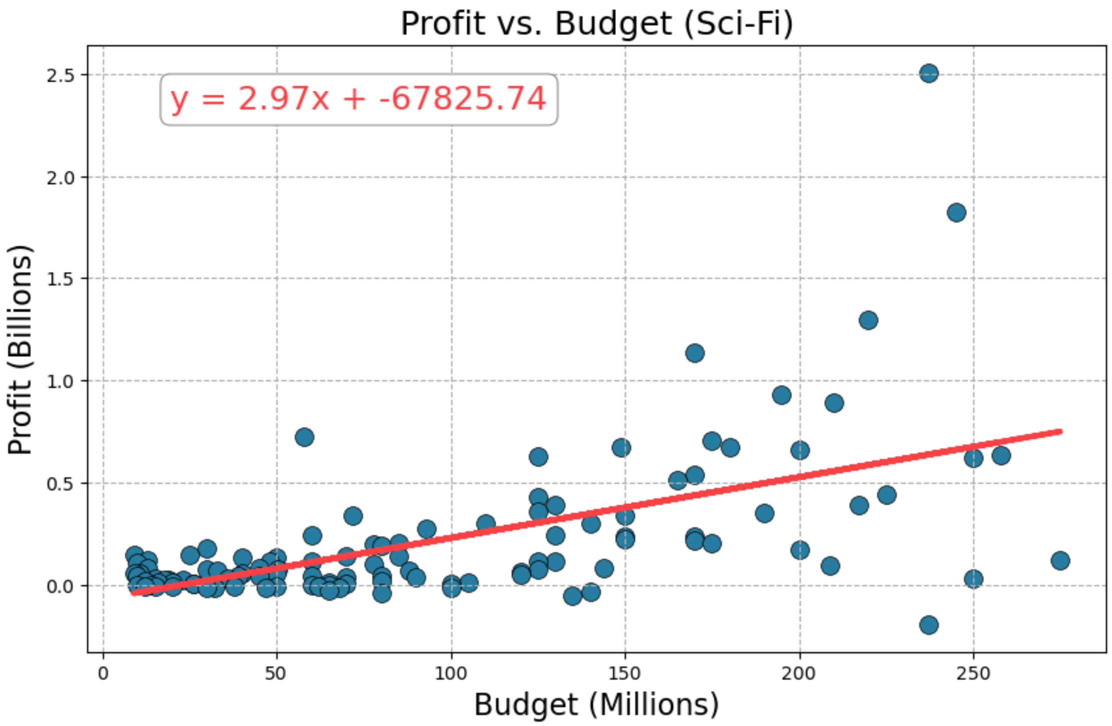
**Analysis: Romantic movies are about the same as comedies.**

### 1.3.5 Sci-Fi

[13]:
```
create_linear_regression_plot_genre(df, 'Budget_$', 'profit', 'Budget',␣
↪'Profit', 'Profit vs. Budget', 'Sci-Fi')
```

```
The r-squared is: 0.3277254556220426

Highest Profit:
- Title: Avatar (2009)
- Budget: $237.00 Million
- Revenue: $2.74 Billion
- Profit: $2.51 Billion
```

```
Biggest Flop:
- Title: Stealth (2005)
- Budget: $135.00 Million
- Revenue: $79.27 Million
- Loss: $55.73 Million

Highest Budget:
- Title: Solo: A Star Wars Story (2018)
- Budget: $275.00 Million
- Revenue: $392.92 Million
- Profit: $117.92 Million

Lowest Budget:
- Title: Escape Room (2019)
- Budget: $9.00 Million
- Revenue: $155.71 Million
- Profit: $146.71 Million
```



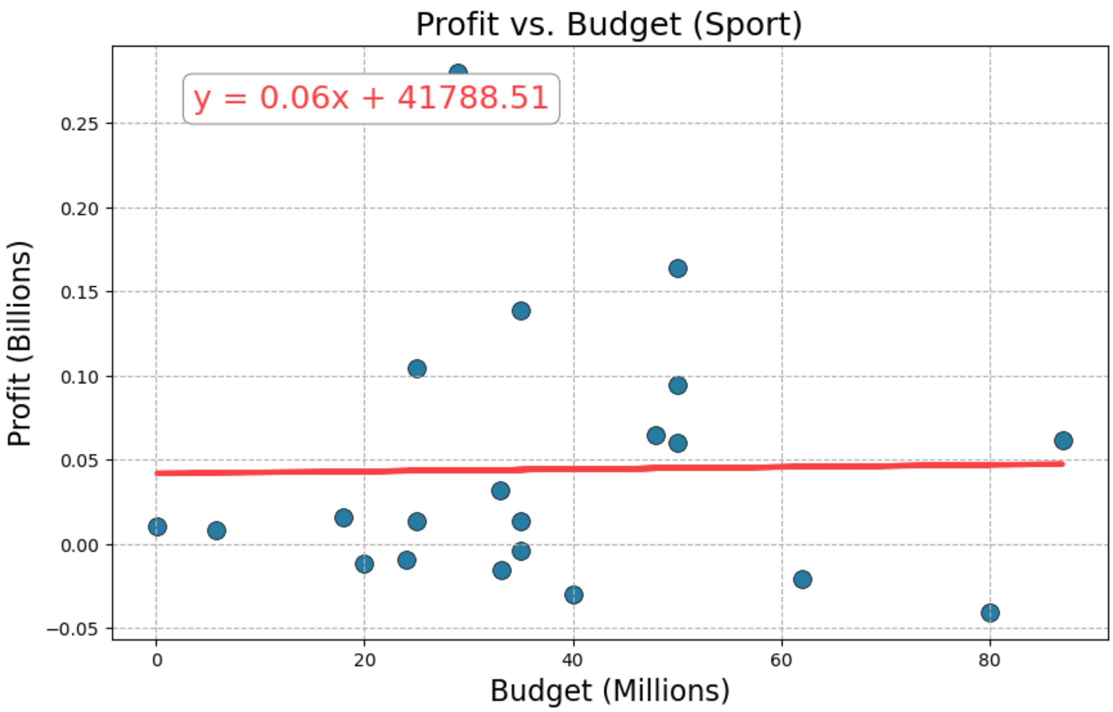
**Analysis: Sci-Fi movies have a higher r-squared value which is to be expected, but it still seems like it's not the most important factor in its success.**

### 1.3.6 Sport

[14]:

```python
create_linear_regression_plot_genre(df, 'Budget_$', 'profit', 'Budget',␣
 ↪'Profit', 'Profit vs. Budget', 'Sport')
```

```
The r-squared is: 0.0003058958736150328

Highest Profit:
- Title: The Blind Side (2009)
- Budget: $29.00 Million
- Revenue: $309.21 Million
- Profit: $280.21 Million

Biggest Flop:
- Title: The Legend of Bagger Vance (2000)
- Budget: $80.00 Million
- Revenue: $39.46 Million
- Loss: $40.54 Million

Highest Budget:
- Title: Seabiscuit (2003)
- Budget: $87.00 Million
- Revenue: $148.34 Million
- Profit: $61.34 Million

Lowest Budget:
- Title: Facing the Giants (2006)
- Budget: $100.00 Thousand
- Revenue: $10.24 Million
- Profit: $10.14 Million
```



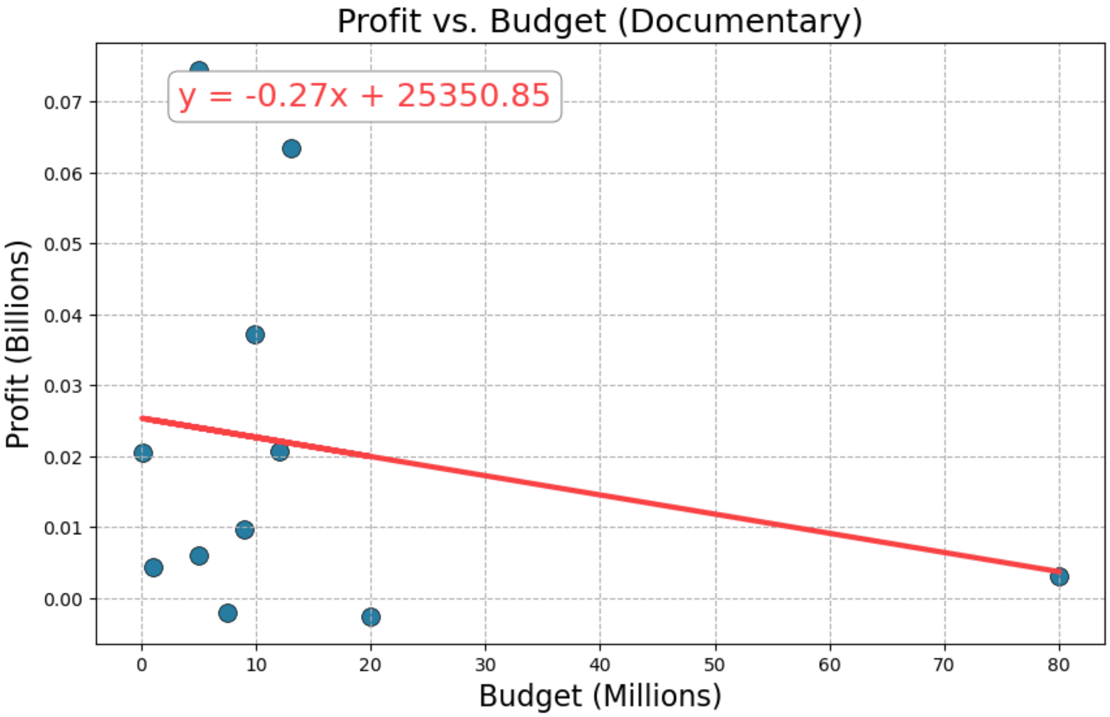
**Analysis: Movies about sports are a considerably smaller sample size, but there appears to be no correlation at all between a sports movie's budget and its box office success.**

### 1.3.7 Documentary

[15]:
```
create_linear_regression_plot_genre(df, 'Budget_$', 'profit', 'Budget',␣
 ↪'Profit', 'Profit vs. Budget', 'Documentary')
```

```
The r-squared is: 0.0525869512860423

Highest Profit:
- Title: Jackass: The Movie (2002)
- Budget: $5.00 Million
- Revenue: $79.49 Million
- Profit: $74.49 Million

Biggest Flop:
- Title: Capitalism: A Love Story (2009)
- Budget: $20.00 Million
- Revenue: $17.44 Million
- Loss: $2.56 Million

Highest Budget:
```

```
- Title: Oceans (2010)
- Budget: $80.00 Million
- Revenue: $83.09 Million
- Profit: $3.09 Million

Lowest Budget:
- Title: Super Size Me (2004)
- Budget: $65.00 Thousand
- Revenue: $20.65 Million
- Profit: $20.58 Million
```



**Analysis: A documentary's budget only accounts for about 5% of its success.**

```
[ ]:
```