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Class: 3DM

Course: DSC261-3 - Data Visualization

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Exercise No: Lab Assignment-8

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**Forecasting and Trend Lines in Tableau**

**Forecasting**

Forecasting in Tableau is a powerful analytical feature that predicts future values based on historical data patterns. It uses exponential smoothing algorithms to analyse time series data and generate predictions with confidence intervals. Tableau's forecasting automatically detects seasonality, trends, and cyclical patterns in the data, making it an effective tool for business planning and decision-making.

In this task, forecasting helps us predict future movie industry performance based on historical revenue and ticket sales data, enabling stakeholders to make informed decisions about market trends and investment opportunities.

**Trend Lines**

Trend lines in Tableau are statistical models that show the general direction and pattern of data over time or across different variables. They help identify relationships, correlations, and long-term patterns in datasets. Tableau offers various trend line models including linear, logarithmic, exponential, polynomial, and power trends, allowing analysts to choose the best fit for their data characteristics.

In this task, trend lines help us analyse the relationship between different movie industry metrics such as revenue growth over time, correlation between tickets sold and gross revenue, and genre performance patterns across the years.

## **Movies Genre Statistics Dataset**

### **About Dataset**

This dataset provides comprehensive genre statistics for movies released between 1995 and 2018. It includes information about the genre, year of release, number of movies released, gross revenue generated, tickets sold, and inflation-adjusted gross revenue. Additionally, it offers details about the highest-grossing movie each year, including its title and the corresponding gross revenue. The dataset aims to provide detailed insights into film genres' performances between 1995 and 2018 by presenting various metrics such as ticket sales, monetary success (both adjusted and unadjusted), and information regarding top-performing movies every year.

### **Dataset Structure**

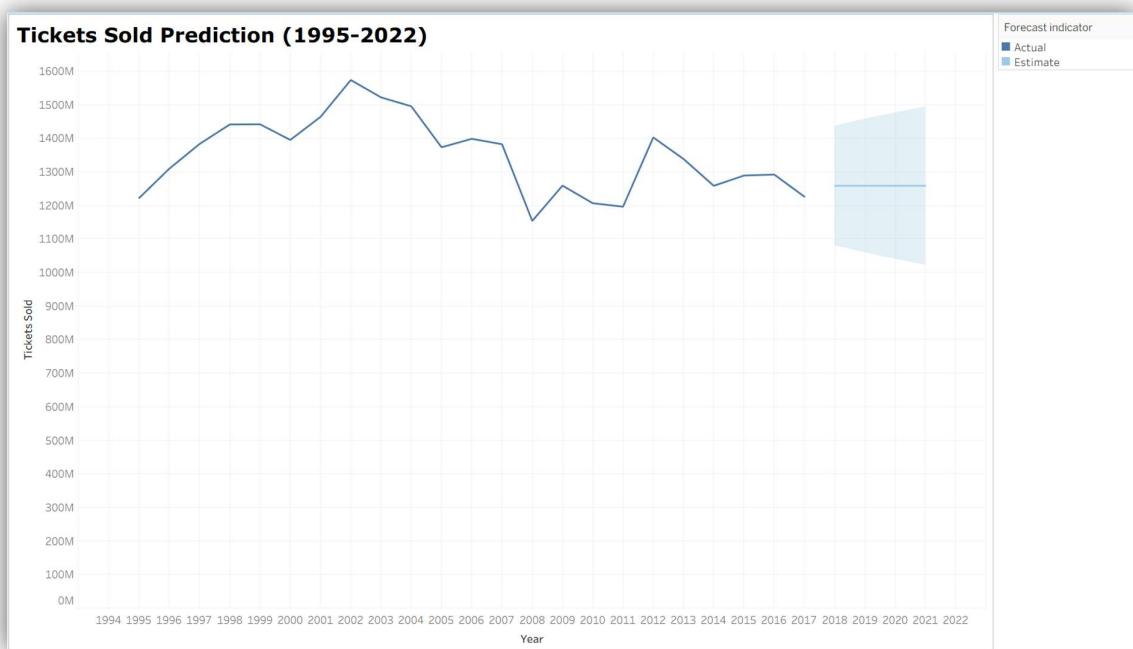
<b>Attribute</b>	<b>Description</b>
Genre	The genre of movies released in a particular year (Categorical)
Year	The year in which the movies were released (Date)
Movies Released	The number of movies released in a specific year (Numerical)
Gross	The total gross revenue generated by all movies released in a particular year (Numerical)
Tickets Sold	The total number of tickets sold for all movies released in a given year (Numerical)
Inflation-Adjusted Gross	The gross revenue adjusted for inflation, considering changes in money value over time (Numerical)
Top Movie	The title of the highest-grossing movie each year (Text/String)
Top Movie Gross (That Year)	The gross revenue generated by the highest-grossing movie in a specific year (Numerical)
Top Movie Inflation-Adjusted Gross (That Year)	The inflation-adjusted gross revenue of the highest-grossing movie each year (Numerical)

## Forecasting

### Forecast 1: Tickets Sold Prediction (1995-2022)

- **Visualization Type:** Time Series Line Chart with Forecast
- **Forecasting Period:** 4 years (2019-2022)
- **Insight:** Predicting future movie theatre attendance based on historical ticket sales data
- **Chart Used:** Line Chart with Exponential Smoothing Forecast

#### Chart:



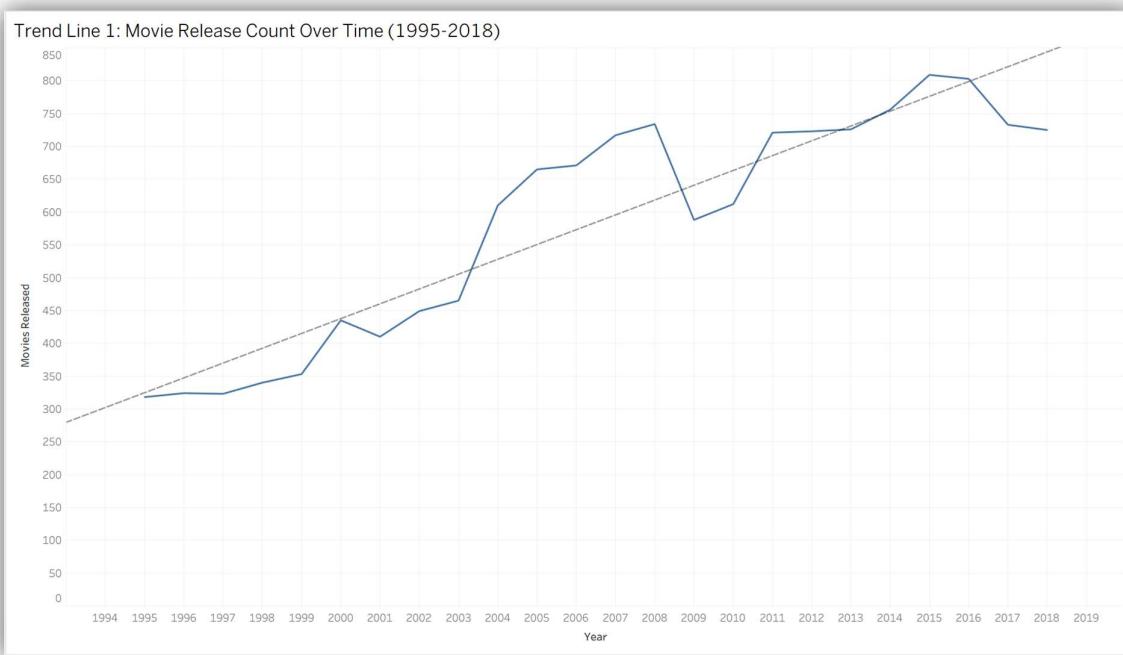
The forecast analysis reveals the projected trajectory of movie theatre attendance. Based on historical data from 1995-2018, the exponential smoothing model shows that ticket sales peaked around 2002-2004 at approximately 1550 million tickets, followed by a general decline through 2010 and some recovery around 2012-2013. The forecast predicts a continued gradual decline in future ticket sales through 2022. The light blue shaded area represents the confidence interval for the estimates, while the dark blue line shows actual historical data. This prediction indicates potential challenges for the movie theatre industry, possibly due to streaming services and changing consumer behaviour.

## Trend Lines

### Trend Line 1: Movie Release Count Over Time (1995-2018)

- **Visualization Type:** Scatter Plot with Linear Trend Line
- **Variables:** Year (X-axis) vs Movies Released (Y-axis)
- **Insight:** Analyzing the trend in movie production volume over the 24-year period
- **Chart Used:** Scatter Plot with Linear Regression Line

**Chart:** [Scatter plot showing the relationship between years and number of movies released, with a linear trend line indicating overall production trends]

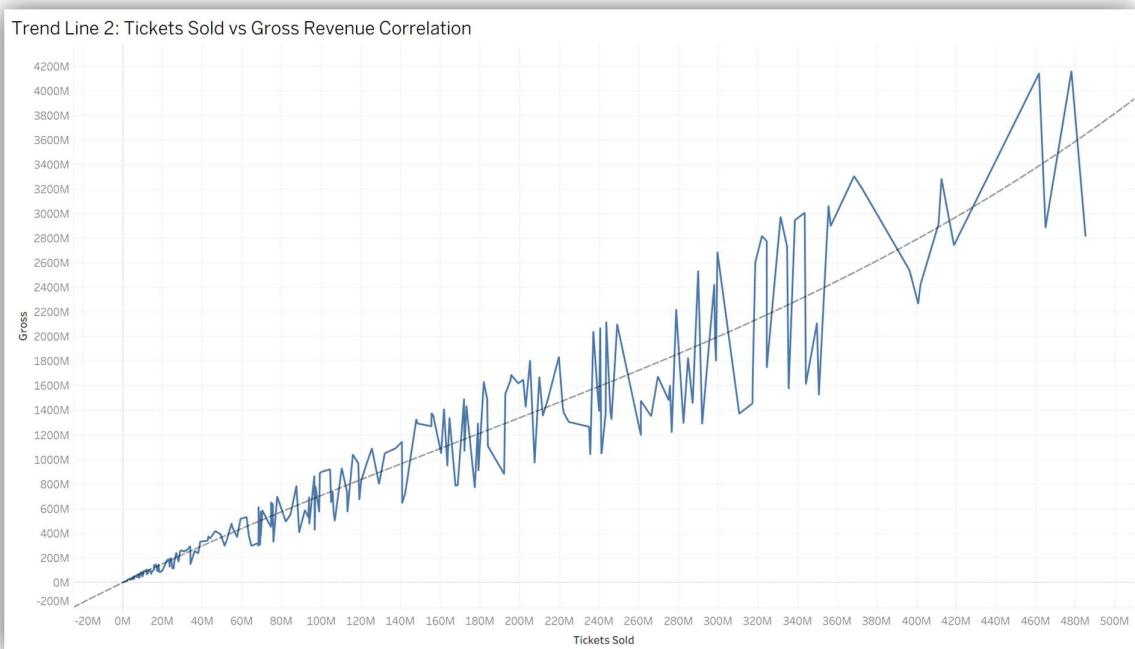


The linear trend line analysis shows the progression of movie production from 1995 to 2018. The trend reveals whether the film industry has been producing more or fewer movies over time, helping understand market saturation, production capacity changes, and industry growth patterns. The R-squared value indicates the strength of the temporal relationship in movie production trends.

## Trend Line 2: Tickets Sold vs Gross Revenue Correlation

- **Visualization Type:** Scatter Plot with Polynomial Trend Line
- **Variables:** Tickets Sold (X-axis) vs Gross Revenue (Y-axis)
- **Insight:** Understanding the relationship between audience engagement and financial performance
- **Chart Used:** Scatter Plot with Polynomial Regression Curve

**Chart:** [Scatter plot displaying the correlation between tickets sold and gross revenue across all years and genres, with a polynomial trend line showing the non-linear relationship]



The polynomial trend line reveals the relationship between ticket sales and gross revenue. This analysis helps understand how ticket pricing, premium formats (IMAX, 3D), and market dynamics affect the revenue-to-ticket ratio. The curved trend line may indicate that higher-grossing movies benefit from premium pricing strategies, showing a non-linear relationship between audience size and total revenue generation.