Sardar Patel Institute of Technology

(Computer Engineering Department)

Big Data Analytics and Visualisation (BDAV)

Experiment 10

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Aim:

Explore and present interactive data insights from real world dataset (Dashboards) using POWER BI.

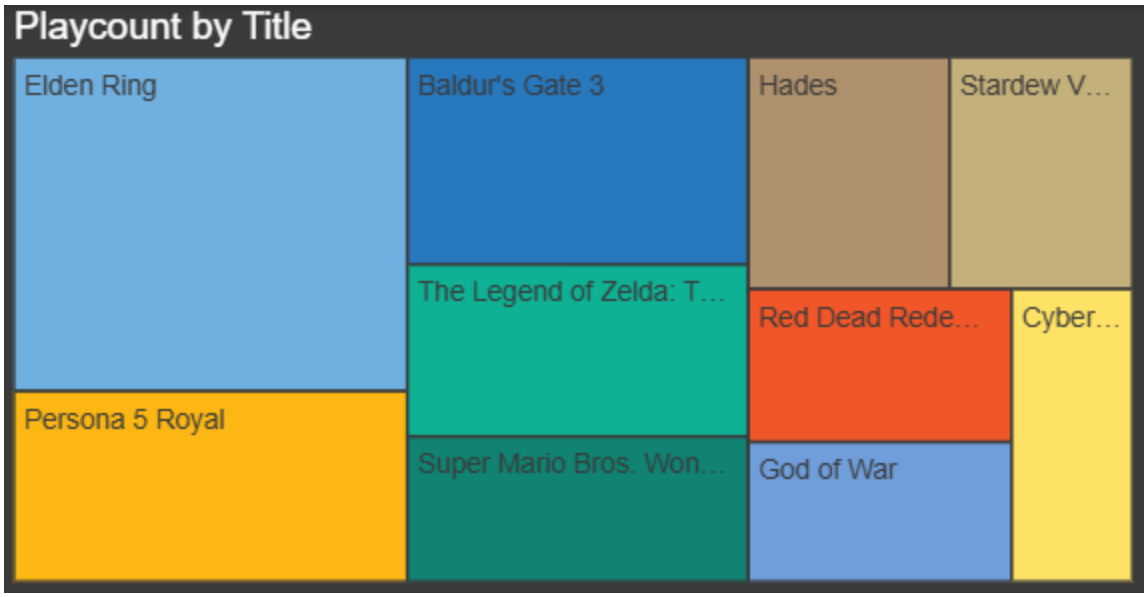
Theory:

Power BI is a powerful business analytics tool developed by Microsoft that enables users to visualize data and share insights across an organization or embed them in an app or website. In the context of big data analytics and visualization, Power BI plays a crucial role by simplifying complex datasets into interactive dashboards and reports that facilitate informed decision-making. As organizations increasingly deal with vast volumes of structured and unstructured data, Power BI offers seamless integration with a variety of data sources including databases, cloud services, and real-time streaming data. Its intuitive drag-and-drop interface and built-in AI capabilities allow users—ranging from business analysts to data scientists—to extract meaningful patterns, trends, and KPIs without requiring deep technical expertise. With features like Power Query for data transformation, DAX (Data Analysis Expressions) for complex calculations, and support for custom visuals, Power BI empowers users to derive actionable insights from big data. Moreover, its cloud-based service ensures real-time collaboration and access to updated reports from anywhere, making it a key tool in modern data-driven environments.

In addition to its robust analytical capabilities, Power BI enhances the overall data storytelling experience through rich and customizable visualizations. These visual elements—such as charts, maps, gauges, and slicers—not only make large datasets more comprehensible but also support dynamic interactivity, allowing users to drill down into specific data points for deeper analysis. In the realm of big data, where speed and scalability are essential, Power BI's ability to handle high-volume datasets efficiently—especially when paired with Azure services or data warehouses like Snowflake or Google BigQuery—ensures smooth performance and responsiveness. Furthermore, with features like natural language querying through Q&A, users can simply ask questions in plain English and receive visual answers instantly, bridging the gap between technical data analysis and business understanding. This combination of accessibility, scalability, and powerful visualization makes Power BI a vital tool for transforming raw big data into meaningful insights that drive strategic decisions.

Implementation:

1. Playcount by Title



- **Visualization Type**: Treemap
  This visualization shows the total number of times each game has been played, using the size of each rectangle to indicate the magnitude of playcounts.

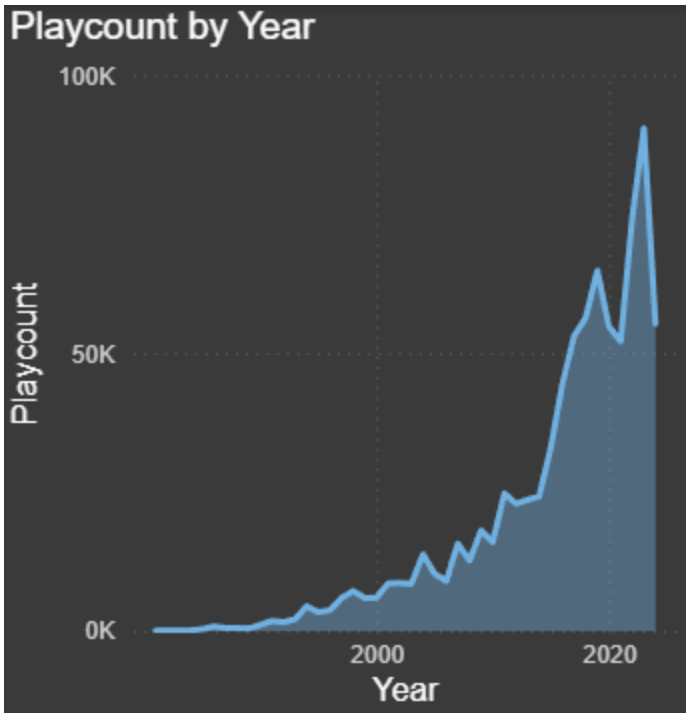
- **Insights**:

  a. *Elden Ring*, *Persona 5 Royal*, and *Baldur's Gate 3* are the most played titles, indicating strong player engagement.

  b. Popular RPG and story-driven titles dominate the top of the chart.

  c. There is a long tail of games with relatively low playcounts, suggesting niche appeal or limited reach.

2. Playcount by Year



- **Visualization Type**: Area Line Chart
  This chart depicts how the total playcounts have changed over the years, revealing trends in player activity and game engagement over time.

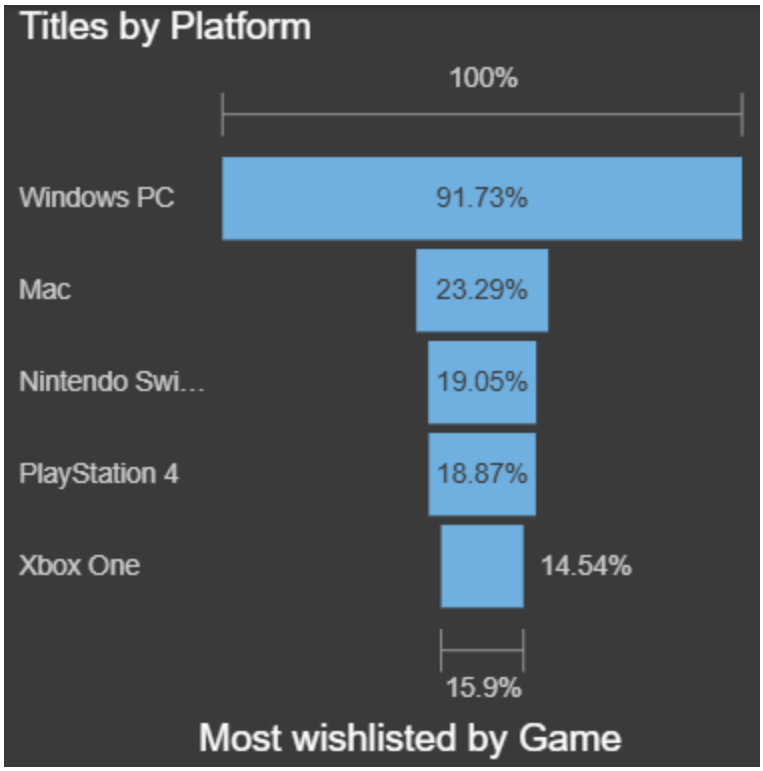
- **Insights**:

  a. There is a noticeable surge in playcounts post-2010, especially around 2020–2022, likely influenced by the COVID-19 pandemic and increased gaming activity.

  b. Newer releases tend to get higher playcounts quicker, suggesting better marketing, accessibility, or hype cycles.

  c. Growth appears exponential rather than linear, indicating an expanding user base on Steam.

3. Titles by Platform



- **Visualization Type**: Funnel Chart
  This chart visualizes the percentage of total titles available on each platform, emphasizing the relative platform distribution of games.

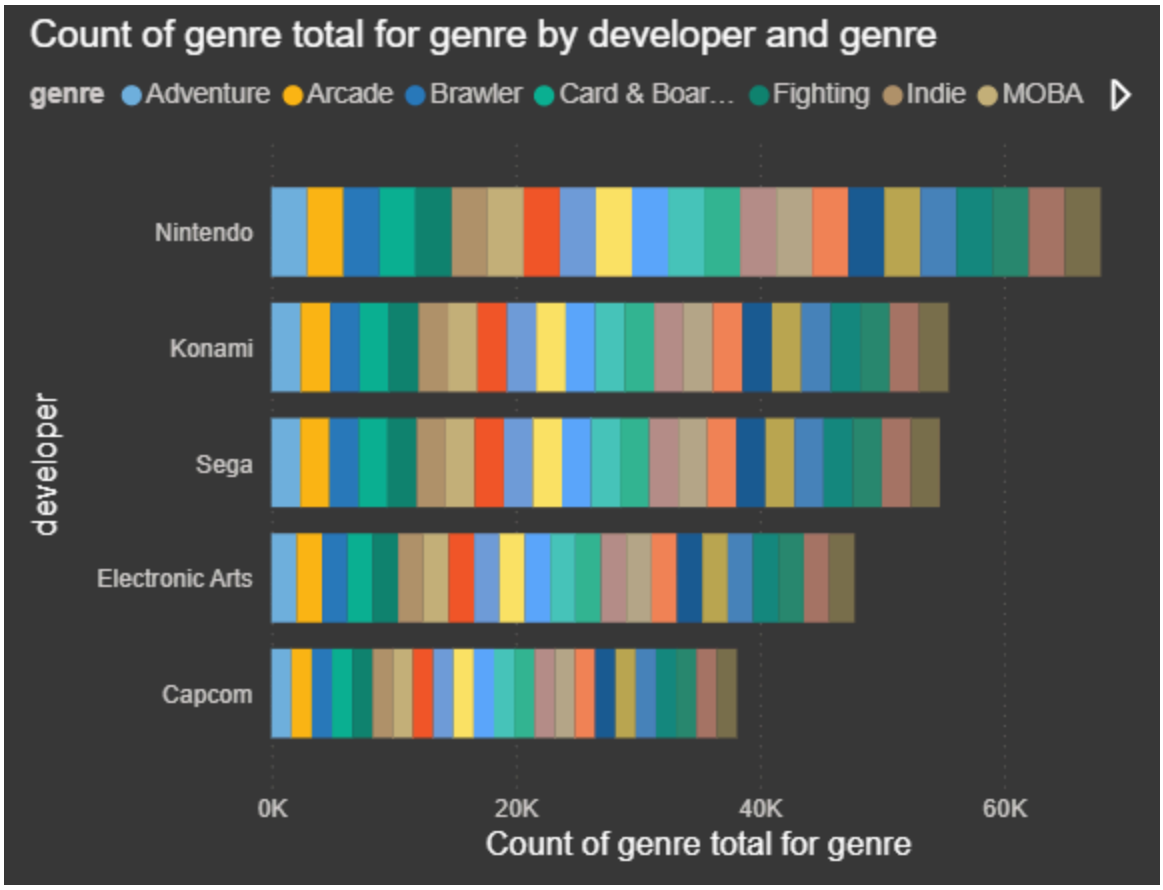
- **Insights**:

  a. A staggering 91.73% of titles are available on Windows, reinforcing its dominance in the PC gaming market.

  b. Linux and Mac support are significantly lower, with Mac titles being around 5.65%.

  c. Minimal presence of Nintendo Switch and PlayStation 4 games reflects Steam's limited crossover with console ecosystems.

4. Count of Genre Total by Developer and Genre



- **Visualization Type**: Stacked Bar Chart
  This chart compares how many games of each genre have been created by different developers, revealing their genre focus and diversity.

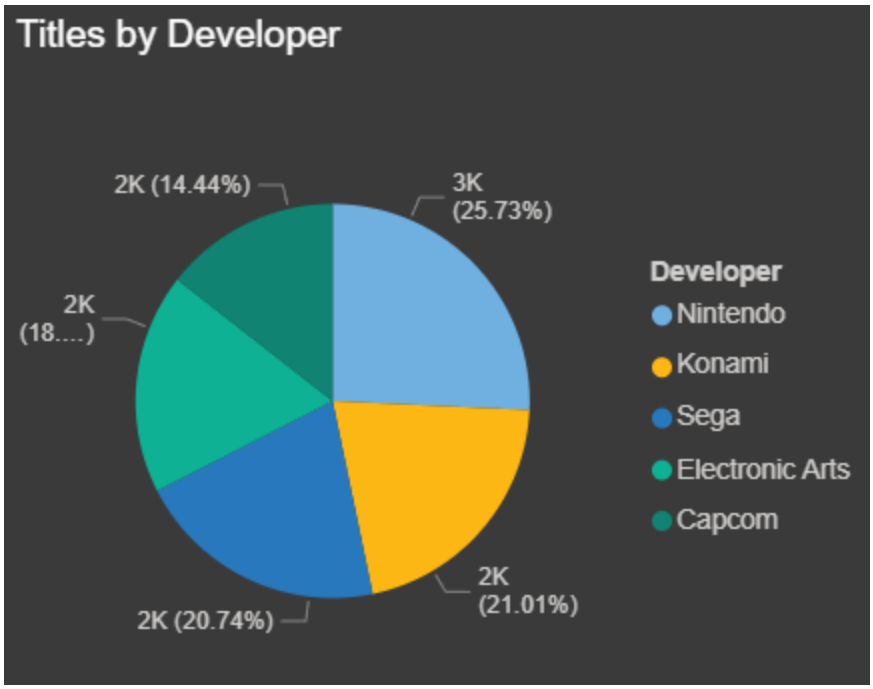
- **Insights**:

  a. Nintendo leads with the most diverse genre offerings, followed closely by Konami and Sega.

  b. Indie, RPG, and action genres are common across most developers, showing their broad popularity.

  c. Ubisoft shows a higher concentration in specific genres, suggesting a more focused development strategy.

5. Titles by Developer



- **Visualization Type**: Pie Chart
  This pie chart shows the proportion of total games released by each developer, helping identify the most prolific publishers.

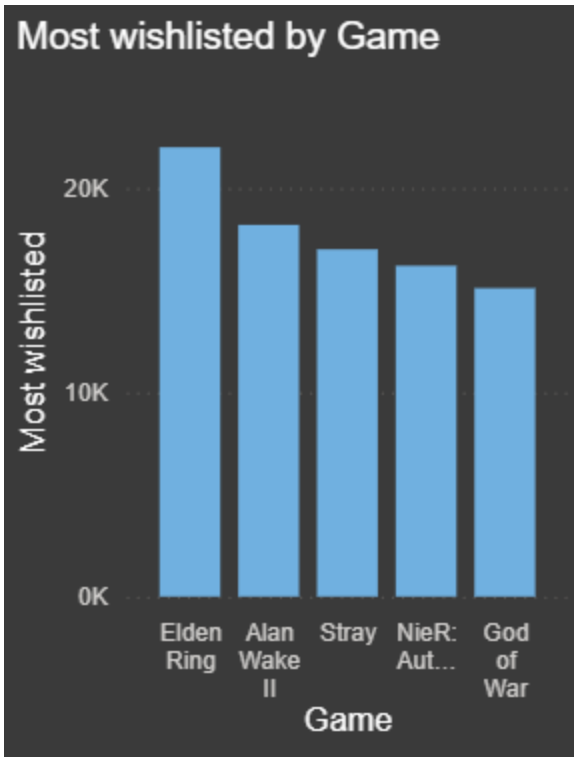
- **Insights**:

  a. Nintendo contributes the highest share of titles at 25.73%, followed by Sega and Electronic Arts.

  b. A small slice of the pie is taken up by smaller studios, highlighting a skewed distribution in favor of large publishers.

  c. This also shows which developers dominate the platform in terms of quantity.

6. Most Wishlisted by Game



- **Visualization Type**: Horizontal Bar Chart
  This chart ranks games by the number of times they were added to user wishlists, indicating anticipated popularity.

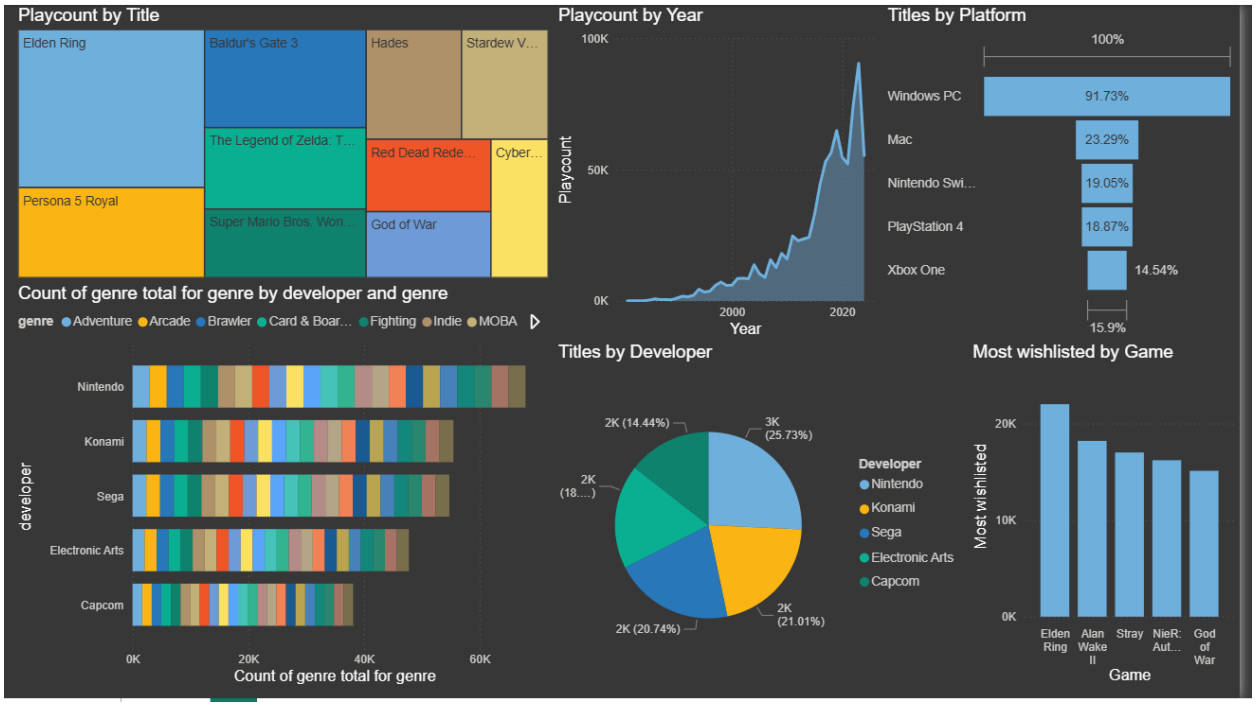
- **Insights**:

  - *Elden Ring* tops the wishlist, followed by *Alan Wake II* and *Stray*, showing strong anticipation pre-release.

  - Games with unique art styles or strong narratives seem to perform well in wishlist rankings.

  - Wishlist data can serve as a predictor of future success or peak playcount trends.

Dashboard:



The final Power BI dashboard offers a comprehensive visual summary of gameplay trends, platform distribution, developer output, genre preferences, and user interest metrics across a wide range of video games. Designed for game analysts, developers, or enthusiasts, the dashboard consolidates multiple insights into one interactive space, allowing users to explore key patterns and outliers in the gaming landscape.

The primary purpose of this dashboard is to provide a data-driven overview of gaming trends—highlighting which games are most played, which platforms dominate distribution, what genres are popular among developers, and what titles generate the most user anticipation. It supports decision-making for stakeholders by uncovering both macro and micro trends within the gaming industry.

Functionalities:

1. **Interactive Filtering**: Users can click on genres, developers, or years to dynamically update related visuals and drill into specific segments of interest.

2. **Comparative Analysis**: Side-by-side charts enable quick comparisons across time, platforms, or companies.

3. **Highlighting Trends**: Area charts and treemaps reveal patterns over time and volume of engagement.

4. **Developer & Genre Focus**: Visuals allow identification of which developers focus on which genres, helping understand market positioning.

5. **User Engagement Indicators**: Wishlist and playcount data offer a glimpse into user behavior and potential success of titles.

Conclusion:

This Power BI dashboard effectively explores and presents data insights from a real-world video game dataset. It leverages Power BI features such as area charts, treemaps, column charts, bar charts, and interactive slicers to provide a comprehensive, dynamic view of the gaming landscape. Users can draw meaningful insights into game popularity, developer activity, platform trends, genre distribution, and user engagement—enabling informed analysis and strategic decision-making within the gaming industry.