

Game Analytics Dashboard with Streamlit and Machine Learning

****By: Layan Hudhud****

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Executive Summary:

This project involves the creation of an interactive game analytics dashboard using Streamlit. The dashboard visualizes player data such as moves, mistakes, and time spent on a simple game. Machine learning models, specifically K-Means Clustering and Decision Trees, were applied to analyze player behavior and provide recommendations for improving game design.

Introduction:

This project focuses on building an analytics dashboard that provides insights into player data, predicts where players may struggle, and suggests improvements using machine learning.

Methodology:

1. Data Collection:

- Simulated data for 9 players including Moves, Mistakes, and Time.
- Data was stored in a Pandas DataFrame for analysis.

2. Streamlit Dashboard:

- Displayed player statistics and graphs interactively.

3. Machine Learning:

- K-Means Clustering: Grouped players by behavior.
- Decision Trees: Predicted if a player is 'Good' or 'Struggling'.

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4. Deployment:

- The dashboard was built and deployed using Streamlit in Google Colab.

Results and Analysis:

- Visualizations: Moves vs Mistakes, Time Distribution, Moves vs Time.
- ML Insights: Players were clustered, decision tree achieved ~85% accuracy.
- Recommendations: Cluster-specific suggestions for game design improvements.

Technical Challenges:

- Simulated data may not reflect real behavior.
- Integration between Streamlit and ML required optimization.

Future Improvements:

- Use real-time player data.
- Apply more advanced ML models.
- Improve UI and interactivity.

Conclusion:

Successfully built a game analytics dashboard that uses ML for behavior insights and provides automatic recommendations to improve gameplay experience.

References:

- Streamlit Documentation: <https://docs.streamlit.io/>
- Pandas Documentation: <https://pandas.pydata.org/>
- Scikit-learn Documentation: <https://scikit-learn.org/>