**Data Analytics Capstone Topic Approval Form**

**Student Name:** Lora Milam

**Student ID:** 001540282

**Capstone Project Name:** Gotta Analyze 'Em All: Pokémon TCG Price Projections and Analysis

**Project Topic**: Determine the English Pokémon card with the highest return on investment.

**This project does not involve human subjects research and is exempt from WGU IRB review.**

**Research Question:** Which English Pokémon card has the highest return on investment?

**Hypothesis**: The project's hypothesis proposes that certain attributes, such as rarity, set, and condition, will correlate with higher returns on investment for specific cards within the Pokémon TCG ecosystem

**Context:**

Determining the Pokémon card with the highest return on investment can greatly benefit from data analysis for several reasons. In a collectible card game like Pokémon Trading Card Game (TCG), the market for cards is complex and subject to various factors. Data analysis can help provide valuable insights and inform investment decisions in several ways. Data analysis allows for the examination of historical card prices and their fluctuations. By studying price trends over time, one can identify cards that have consistently increased in value, making them strong candidates for a high return on investment. Data analysis can unveil patterns and correlations between various card attributes and their market performance. This includes factors such as card rarity, card type, set, condition, and more. Understanding these patterns can help investors make informed choices. Data analysis can guide investors in building diversified portfolios of cards. By identifying cards with different performance characteristics, investors can reduce risk and maximize the potential for strong returns. Data analysis can help investors decide when to buy or sell specific cards. It can identify optimal entry points when a card's price is low and exit points when it's high. This data-driven approach minimizes the risk of making poor investment choices.

In conclusion, the world of Pokémon Trading Card Game (TCG) is a multifaceted marketplace influenced by a myriad of factors, making it a challenging arena for investors seeking the card with the highest return on investment. However, through the lens of data analysis, we can unlock the secrets hidden within this complex domain. By examining historical price data, identifying patterns in card attributes, diversifying portfolios, and providing insights for informed buying and selling decisions, data analysis becomes an indispensable tool for those navigating the ever-evolving landscape of Pokémon TCG investments. It empowers investors to make data-driven choices, minimize risks, and uncover the cards that offer the promise of the highest returns.

**Data:**

For this project, I will require datasets containing historical pricing information for English Pokémon TCG booster packs spanning various sets, historical pricing data for individual English Pokémon TCG cards, and card attributes. The historical pricing data for English Pokémon TCG booster packs and card attributes will be instrumental in assessing the projected initial cost associated with acquiring a specific Pokémon card, achieved through a comparative analysis of booster pack costs and the likelihood of obtaining a specific card. Additionally, the historical pricing data for individual English Pokémon TCG cards will facilitate a comparison between the anticipated initial acquisition cost of a specific card and its potential profit margin. The historical pricing data for English Pokémon TCG booster packs can also be harnessed, in conjunction with machine learning techniques, to forecast forthcoming trends and fluctuations within this product market.

**Data Gathering:**

In an ideal scenario, a dataset will be accessible via an online data repository like Kaggle. Should such a dataset not be readily obtainable, I will collect the historical pricing data from a market price platform such as TCGplayer or PriceChart. In the event that this data is also not readily accessible, I will acquire the rarity ratios from a source such as TCGplayer.

**Data Analytics Tools and Techniques**: Tableau, Python, and Recurrent Neural Network (RNN) models are appropriate techniques to determine the Pokémon card with the highest return on investment.

**Justification of Tools/Techniques:**

Data Visualization with Tableau: Tableau is a powerful data visualization tool that can be instrumental in understanding the complex data related to Pokémon cards. It allows you to create interactive and informative visualizations, including price trends, patterns, and correlations between card attributes. Visualizations can make it easier to identify trends and make informed investment decisions.

Data Cleaning and Analysis with Python: Python is a versatile programming language, particularly well-suited for data cleaning, manipulation, and analysis. With Python, you can process and prepare the diverse datasets required for this analysis. Python's extensive libraries, such as pandas and NumPy, provide tools for data cleansing, transformation, and statistical analysis, allowing you to explore historical pricing data, card attributes, and more.

Recurrent Neural Network (RNN) for Predictive Analysis: RNN models are appropriate for time-series data analysis, making them a valuable tool for forecasting price trends in the Pokémon TCG card market. By training an RNN on historical pricing data, you can model and predict future price fluctuations. RNNs are particularly useful for capturing sequential dependencies and patterns in data, which is crucial for understanding how card prices evolve over time.

**Project Outcomes**:

This project will pinpoint specific Pokémon cards with a track record of the highest return on investment. These cards will be identified based on historical price data, card attributes, and market dynamics. Through the use of data visualization tools like Tableau, the project will provide interactive and informative visualizations of price trends, patterns, and correlations between card attributes. These visualizations will help investors gain a better understanding of the market. The development and implementation of a Recurrent Neural Network (RNN) model will allow for the forecasting of future price trends in the Pokémon TCG card market. This model will provide insights into potential future returns on specific cards. A well-organized and cleaned dataset will be made available, encompassing historical pricing data of Pokémon TCG booster packs and individual cards, as well as card attributes and market dynamics. This dataset will serve as a valuable resource for future analyses. A comprehensive documentation and report summarizing the methodology, findings, and recommendations will be provided. This report will serve as a reference for investors seeking to understand the project's insights and outcomes.

**Projected Project End Date**: Nov 30,2023

**Sources**: TBA

**Course Instructor Signature/Date:**

The research is exempt from an IRB Review.

An IRB approval is in place (provide proof in appendix B).

Course Instructor’s Approval Status: Approved

Date: Click here to enter a date.

Reviewed by:

Comments: Click here to enter text.