Exploratory Data Analysis (EDA) with Pandas in Human Psychology Dataset

The purpose of this project is to explore and analyze the Human Psychology Dataset using the Pandas framework to derive insights into mental health behaviors, emotional stability, coping mechanisms, and overall well-being.

Goals of the Project:

Explore the Human Psychology Dataset using Pandas.

Perform feature engineering to derive useful insights.

Visualize data distributions and trends with various plot types.

Summarize key findings that can aid in understanding psychological well-being.

Materials and Methods

The dataset used in this project contains information about individuals' psychological traits, such as personality type, emotional stability, stress levels, sleep patterns, and coping mechanisms. These data points are crucial for understanding mental health and well-being.

General Process:

Libraries Imported: Pandas, NumPy, Seaborn, Matplotlib

Dataset Exploration: Initial exploration of the dataset, checking for missing values, duplicates, and generating summary statistics.

Feature Engineering: Transforming date columns and creating new features such as sleep hours and optimism scores.

Visualization: Distribution analysis, relationships between psychological traits, and time-based trends.

Project Outcome & Insights

The project performs Exploratory Data Analysis (EDA) on the Human Psychology Dataset, providing valuable insights into psychological traits and behaviors.

1. Psychological Traits Analysis

Key Insights:

Anxiety & Sleep: A significant negative correlation was observed between anxiety levels and sleep hours. Individuals who experience higher anxiety tend to sleep fewer hours.

Optimism & Age: Older individuals in the dataset report lower optimism scores, suggesting that optimism tends to decline with age.

Self-Esteem & Optimism: A positive correlation was found between self-esteem and optimism, where individuals with higher self-esteem are generally more optimistic.

2. Psychological Features Breakdown

Personality Types:

The dataset reveals that the majority of individuals are extroverts, followed by introverts. Ambiverts are less common.

Coping Mechanisms:

Various coping mechanisms like exercise, meditation, and journaling were observed. People using exercise as a coping mechanism tend to report better emotional stability and self-esteem.

3. Mental Health & Life Satisfaction

Key Insights:

Satisfaction with Life:

A positive relationship was found between self-esteem and life satisfaction. Those with higher self-esteem tend to report greater satisfaction with life.

Stress and Emotional Stability:

Individuals with higher emotional stability show significantly lower stress levels, suggesting the importance of emotional regulation in mental health.

Feature Engineering:

Several new columns were created to enhance the analysis:

Age Group: Categorized age into Young (18-30), Middle-Aged (31-45), and Older (46-60).

Sleep Pattern: A Boolean flag indicating whether a person is getting enough sleep (8+ hours per night).

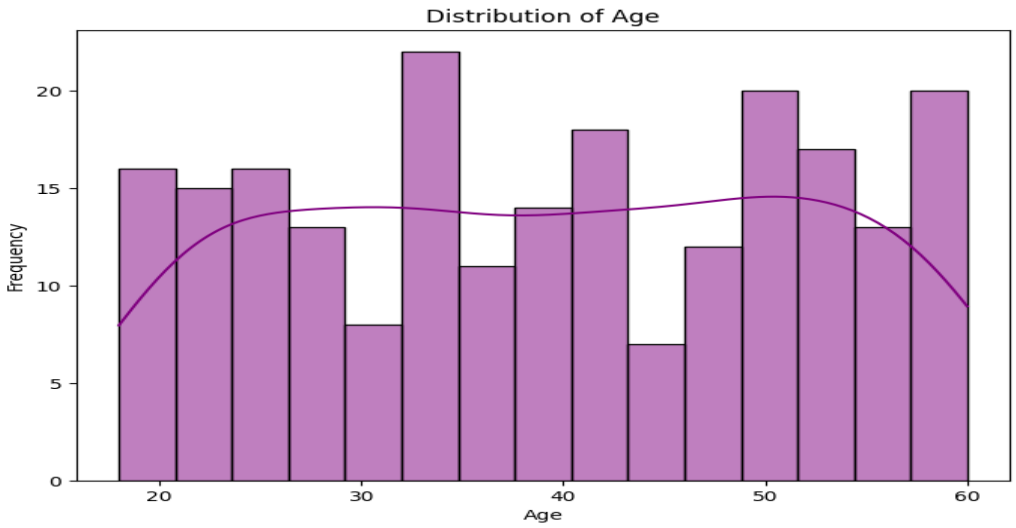
Coping Mechanism Type: Categorized individuals by coping mechanism (e.g., exercise, meditation, journaling).

Anxiety & Stress Index: Created an anxiety_stress_score combining both anxiety and stress levels.

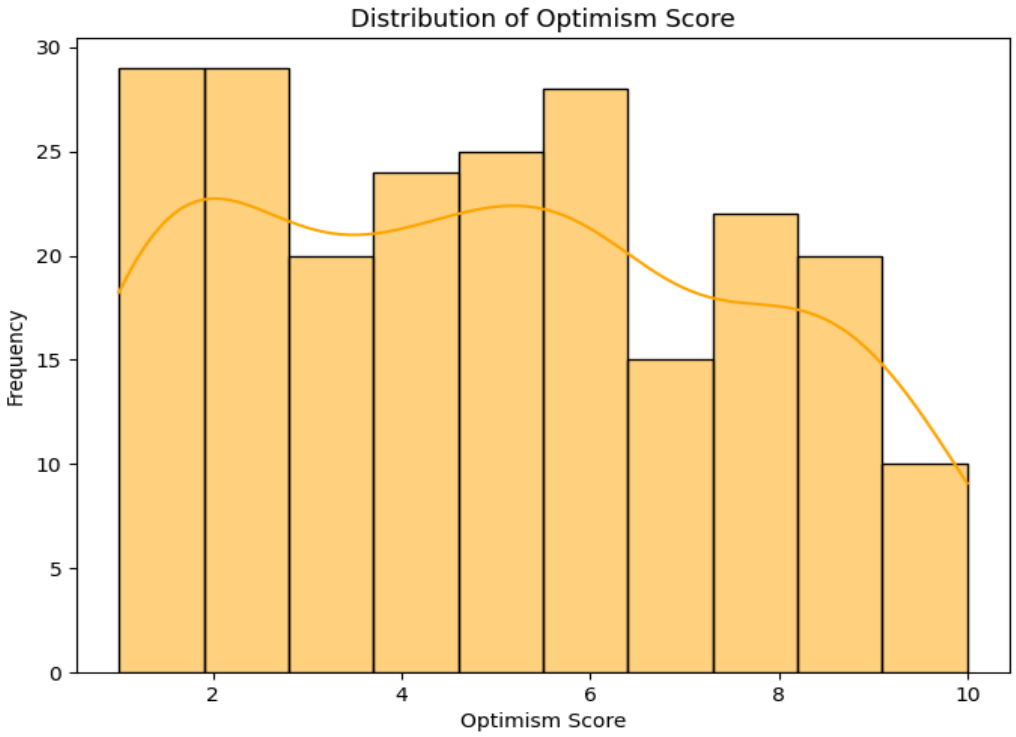
A strong positive correlation was found, where higher optimism is linked to greater life satisfaction.

Visualization:

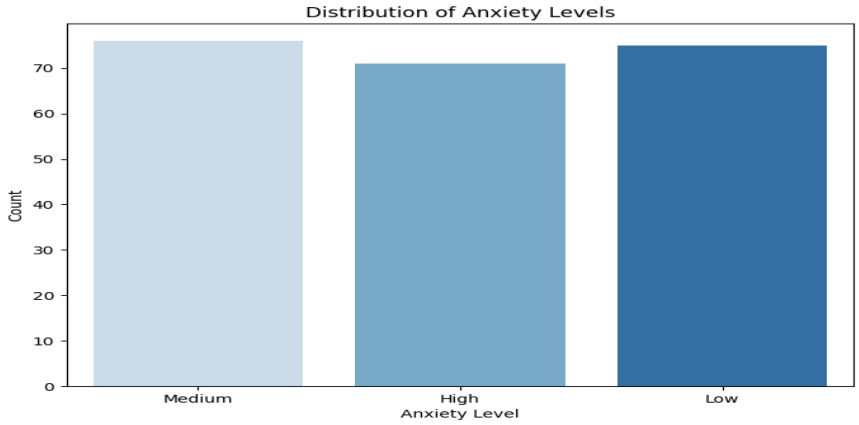
- Distribution of Age.(Histogram)



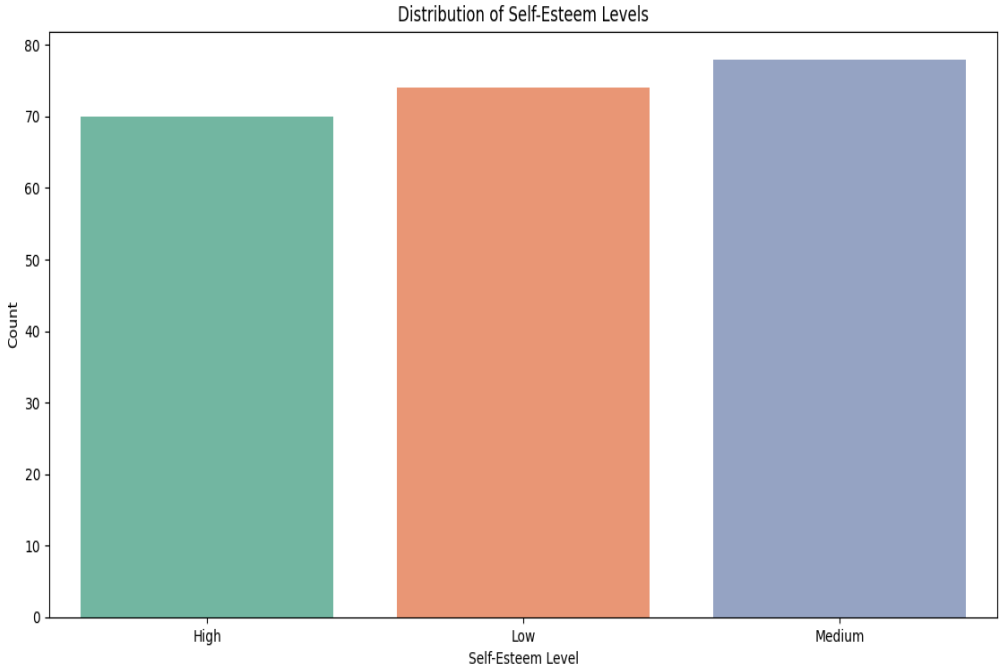
- Distribution of Optimism Score.(Histogram)



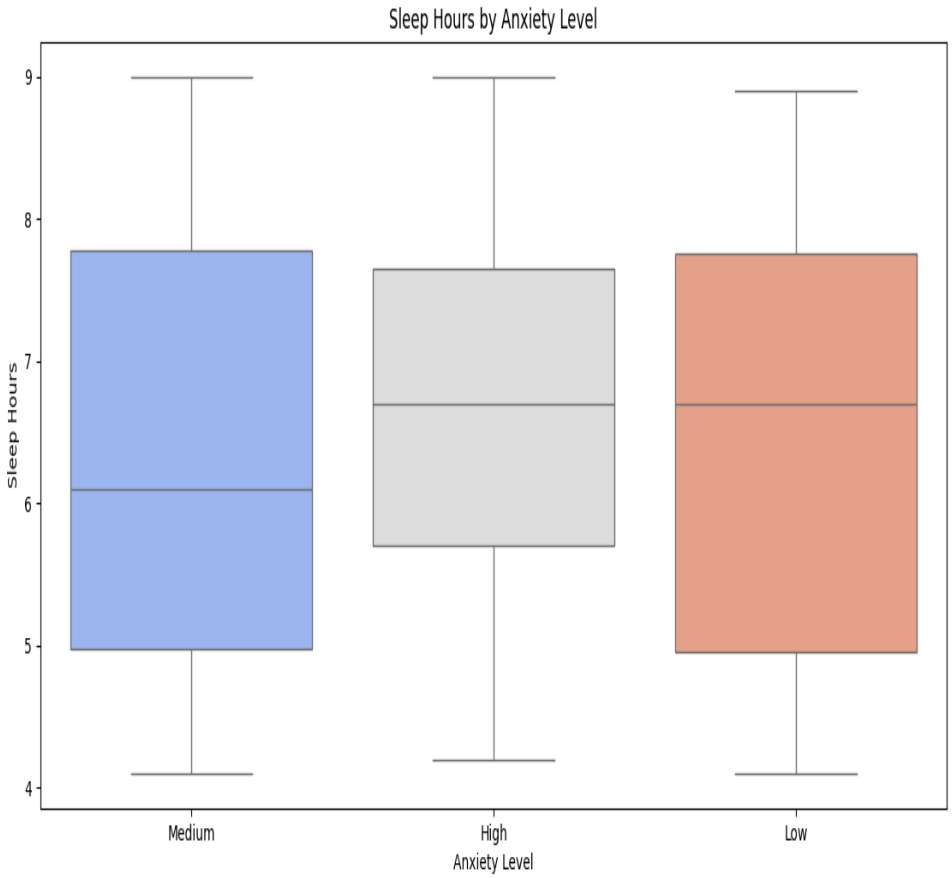
- Distribution of Anxiety Levels(Bar Chart)



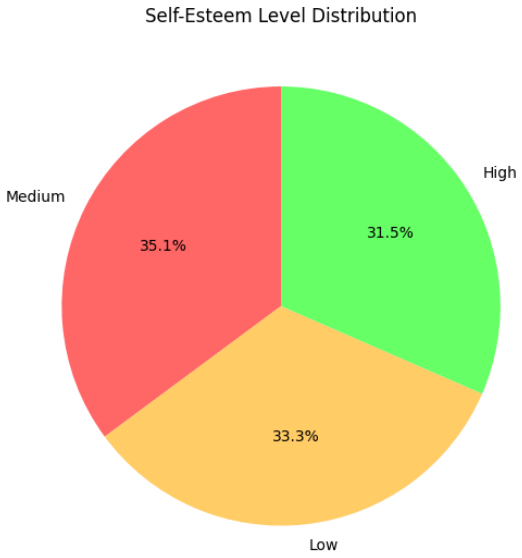
- Distribution of Anxiety Levels(Bar Chart)



- Sleep Hours by Anxiety Levels(Bar Chart)



- Optimism Score vs Age.



- Self-Esteem Levels(Pie Chart)