Digital Health (GPH) Hanieh Karimi

Link to Github: https://github.com/hnkarimi96/Digital-health

Link to Shiny App: https://haniehkarimi.shinyapps.io/shiny/

Link to Dataset: https://www.kaggle.com/datasets/imtkaggleteam/mental-health/data

Dataset Context

The dataset used in this application is about mental health, a critical aspect of well-being. It highlights survey-based data about mental health conditions and their prevalence in different locations over time. The data is presented with standardized age-specific prevalence rates for both sexes combined. The data includes the following variables:

- **Entity (Country/Region)**: Identifies the country or region being analyzed
- **Code**: An abbreviation for the country (e.g., AFG for Afghanistan).
- **Year**: The year of data collection (1990 to 2019).
- **Prevalence of Mental Health Issues**: Schizophrenia, Depression, Anxiety, Bipolar, and Eating Disorders.

Key Trends:

- **Schizophrenia Disorders**: For this category, prevalence remained stable across all countries. Afghanistan and Africa stayed around 0.22%, with slight fluctuations. Albania increased from 0.28% (1990) to 0.29% (2019), while Algeria remained constant at ~0.25%.
- **Depressive Disorders**: The prevalence of depressive disorders is a key part of the dataset. The prevalence in Afghanistan was near 5.00%, declining slightly to 4.94% by 2019. Africa went down gradually from 4.60% to 4.46%, and Albania had a minor increase from 2.38% to 2.46%. Algeria remained stable at around 4.25% but decreased slightly over the period.
- **Anxiety Disorders**: The prevalenc of this category was relatively low. Afghanistan declined from 4.71% to 4.83% and Africa remained constant at 3.70%. Albania increased slightly from 3.66% to 3.84%, while Algeria stayed around 4.63%.
- **Bipolar Disorders**: The fluctuations were minimal. Afghanistan (0.70%) and Africa (0.61%) remained stable. Albania had a minor rise from 0.54% to 0.54%, while Algeria remained constant at 0.76%.
- **Eating Disorders**: The variations in this category were the most. Afghanistan declined from 0.13% to 0.12%, while Africa and Albania fluctuated between 0.11% and 0.14%. Algeria showed the highest variability, starting at 0.19% with some fluctuations.

To sum up, schizophrenia and bipolar disorders remained stable, while depressive and anxiety disorders had slight fluctuations. Eating disorders showed a marginal decline. Future analysis could examine socioeconomic, political, and healthcare effects on mental health prevalence.

Persona

> This dataset can be used by public health researchers, policymakers, and healthcare professionals who work on mental health issues. They may be conducting comparative analyses or epidemiological research to address mental health issues with the aid of the provided data.

Code Description

This Shiny application **"Mental Health"** is designed to clean and visualize mental health survey data.

1. User Interface (UI)

The User Interface (UI) includes the following elements:

- **Title Panel**: Displays the application title.
- **Sidebar Panel**:
    - A fileInput widget to upload a CSV file.
    - Two selectInput widgets to choose the X and Y variables for plotting.
    - A checkboxInput that lets users toggle the visibility of the data table.
    - A sliderInput to adjust the sample size displayed and plotted.
- **Main Panel**: Contains a tabsetPanel with two tabs:
    - **Plot Tab**: Displays a scatter plot.
    - **Data Table Tab**: Displays a cleaned data table.

2. Server Logic

The server logic includes data cleaning, visualization, and user interactions.

Data Cleaning Function

The clean_data function ensures the uploaded dataset is accurate. Key cleaning steps include:

- **Missing Value Removal** (na.omit.)
- **Duplicate Removal** (!duplicated.)
- **Numeric Conversion**
- **Outlier Removal**

Reactive Dataset

A reactive expression processes the uploaded data file, applying the cleaning function and updating the UI elements. This ensures that users can immediately work with the dataset after uploading it.

Scatter Plot Generation

The renderPlot function creates a scatter plot using ggplot2. The plot updates based on the user's selected X and Y variables and the sample size. This allows users to find relationships between variables visually.

Data Table Rendering

The renderTable function shows a table with the cleaned dataset. Users can toggle its visibility and limit the sample size displayed.

3. Shiny App Execution

At the end, the shinyApp function integrates the UI and server components and launches the interactive application.