Digital Health (GPH) Hanieh Karimi

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

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

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:

- The highest prevalence among diseases was for depressive disorders and anxiety disorders. Schizophrenia and bipolar disorders are less common, typically below 1% of the population. Eating disorders had the lowest prevalence but may be underreported because of the differences in diagnosis and cultural awareness.

- The data suggests gradual changes in mental health conditions, with slight fluctuations year by year.

- Certain countries showed higher prevalence due to reasons like healthcare reporting accuracy, societal stressors, or cultural attitudes toward mental health.
- By mapping the data based on geographical areas, we could visualize regional trends and disparities in mental health.

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 selectInput dropdown for filtering data by Country.
    - 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 loads and processes the preloaded dataset (default_data.csv), applying the cleaning function and updating the UI elements. It also filters the dataset based on the selected country, ensuring that user can immediately work with relevant data.

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, country selection, 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 and filtered dataset based on the selected country. 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.