install.packages(c("ggplot2", "shiny", "dplyr", "tidyr", "readr"))

install.packages("forecast")

install.packages("plotly")

install.packages("readxl")

library(ggplot2)

library(shiny)

library(dplyr)

library(tidyr)

library(readr)

library(plotly)

library(readxl)

#loading the dataset of the CSV format and displaying it

happiness\_data <- read.csv("C:\\Users\\dhruv\\OneDrive\\Documents\\FIV\\DataForFigure2.1WHR2023.csv")

happiness\_data

#view first Few Rows

head(happiness\_data)

#Summary statistics

summary(happiness\_data)

#structure of data

str(happiness\_data)

#Check for missing value

any(is.na(happiness\_data))

#Remove rows with missing values

happiness\_data <- na.omit(happiness\_data)

#Question1: How does the distribution of "Happiness Score" vary across different regions?

#answer: Visualization: Box plot of "Happiness Score" by Region.

ggplot(happiness\_data, aes(x = Country.name, y = `Ladder.score`)) +

geom\_boxplot(fill = "skyblue") +

labs(title = "Distribution of Ladder Score by Country",

x = "Country", y = "Ladder Score") +

theme(axis.text.x = element\_text(angle = 90, hjust = 1, vjust = 1),

plot.title = element\_text(hjust = 0.5))

#Question2: Is there a correlation between "GDP per capita" and "Happiness Score"?

#answer: Visualization: Scatter plot of "GDP per capita" vs. "Happiness Score" with a trendline.

gg\_scatter\_plot <- ggplot(happiness\_data, aes(x = `Logged.GDP.per.capita`, y = `Ladder.score`, text = paste("Country: ", Country.name))) +

geom\_point() +

geom\_smooth(method = "lm", se = FALSE, color = "red") +

labs(title = "Scatter Plot of GDP per Capita vs. Ladder Score",

x = "Logged GDP per Capita", y = "Ladder Score") +

theme\_minimal()

interactive\_scatter\_plot <- ggplotly(gg\_scatter\_plot, tooltip = c("Logged.GDP.per.capita", "Ladder.score", "text"))

print(interactive\_scatter\_plot)

#Question3: How does "Social Support" contribute to overall happiness?

#answer: Visualization: Bar plot comparing "Social Support" across countries.

p <- ggplot(happiness\_data, aes(x = Country.name, y = `Social.support`, text = paste("Country: ", Country.name, "<br>Social Support: ", `Social.support`))) +

geom\_bar(stat = "identity", fill = "skyblue") +

labs(title = "Bar Plot of Social Support by Country",

x = "Country", y = "Social Support") +

theme(axis.text.x = element\_text(angle = 90, hjust = 1, vjust = 1),

plot.title = element\_text(hjust = 0.5))

p <- ggplotly(p)

p

#Question4: Are there any outliers in the "Happiness Score" distribution?

#Visualization: Box plot of "Happiness Score" with identification of outliers

interactive\_box\_plot <- ggplot(happiness\_data, aes(x = "", y = `Ladder.score`)) +

geom\_boxplot(fill = "skyblue", outlier.shape = 1, outlier.colour = "red", outlier.size = 3) +

labs(title = "Box Plot of Happiness Score with Outliers",

x = NULL, y = "Happiness Score") +

theme\_minimal()

interactive\_box\_plot <- ggplotly(interactive\_box\_plot, tooltip = c("Ladder.score"))

print(interactive\_box\_plot)

#Question5: How does the distribution of "Generosity" vary across different regions?

#Answer: Visualization: Box plot of "Generosity" by Region.

interactive\_generosity\_boxplot <- ggplot(happiness\_data, aes(y = Country.name, x = Generosity)) +

geom\_boxplot(fill = "skyblue") +

labs(title = "Distribution of Generosity by Region",

y = "Region", x = "Generosity") +

theme(axis.text.x = element\_text(angle = 45, hjust = 1, vjust = 1),

plot.title = element\_text(hjust = 0.5))

interactive\_generosity\_boxplot <- ggplotly(interactive\_generosity\_boxplot, tooltip = c("Country.name", "Generosity"))

print(interactive\_generosity\_boxplot)

#Question6: Which countries have the highest and lowest "Life Expectancy"?

#answer: Visualization: Bar plot or horizontal bar plot of "Life Expectancy" by Country.

gg\_bar\_plot <- ggplot(happiness\_data, aes(y = reorder(Country.name, `Healthy.life.expectancy`), x = `Healthy.life.expectancy`, text = paste("Country: ", Country.name, "<br>Life Expectancy: ", `Healthy.life.expectancy`))) +

geom\_bar(stat = "identity", fill = "skyblue") +

labs(title = "Bar Plot of Life Expectancy by Country",

y = "Country", x = "Life Expectancy") +

theme(axis.text.x = element\_text(angle = 45, hjust = 1, vjust = 1),

plot.title = element\_text(hjust = 0.5))

interactive\_bar\_plot <- ggplotly(gg\_bar\_plot, tooltip = c("Healthy.life.expectancy", "text"))

print(interactive\_bar\_plot)

#Question7: Is there a relationship between "Freedom to make life choices" and "Perceptions of corruption"?

#Answer: Visualization: Scatter plot of "Freedom to make life choices" vs. "Perceptions of corruption."

interactive\_scatter\_plot <- ggplot(happiness\_data, aes(x = Freedom.to.make.life.choices, y = Perceptions.of.corruption, text = Country.name)) +

geom\_point() +

labs(title = "Scatter Plot of Freedom vs. Perceptions of Corruption",

x = "Freedom to make life choices", y = "Perceptions of Corruption") +

theme\_minimal()

interactive\_scatter\_plot <- ggplotly(interactive\_scatter\_plot, tooltip = c("Freedom.to.make.life.choices", "Perceptions.of.corruption", "text"))

print(interactive\_scatter\_plot)

#Question8: Explore the Relationship Between GDP per Capita and Healthy Life Expectancy

#answer: Create a scatter plot to visualize the relationship between "Logged GDP per Capita" and "Healthy life expectancy."

interactive\_scatter\_plot <- ggplot(happiness\_data, aes(x = `Logged.GDP.per.capita`, y = `Healthy.life.expectancy`, color = Country.name)) +

geom\_point() +

labs(title = "Scatter Plot of GDP per Capita vs. Healthy Life Expectancy",

x = "Logged GDP per Capita", y = "Healthy Life Expectancy") +

theme\_minimal()

interactive\_scatter\_plot <- ggplotly(interactive\_scatter\_plot, tooltip = c("Country.name", "Logged.GDP.per.capita", "Healthy.life.expectancy"))

print(interactive\_scatter\_plot)

#Question9: Assess the Relationship Between Freedom and Happiness Score

#answer: Create a scatter plot to examine the relationship between "Freedom to make life choices" and "Happiness Score" for countries.

interactive\_scatter\_plot <- ggplot(happiness\_data, aes(x = `Freedom.to.make.life.choices`, y = `Ladder.score`, color = Country.name)) +

geom\_point() +

labs(title = "Scatter Plot of Freedom vs. Happiness Score",

x = "Freedom to make life choices", y = "Happiness Score") +

theme\_minimal()

interactive\_scatter\_plot <- ggplotly(interactive\_scatter\_plot, tooltip = c("Country.name", "Freedom.to.make.life.choices", "Ladder.score"))

print(interactive\_scatter\_plot)

#Question10: Investigate the Distribution of Social Support Across Different Regions

#answer:Create a box plot to visually explore how the distribution of "Social support" varies among different regions.

interactive\_box\_plot <- ggplot(happiness\_data, aes(y = Country.name, x = `Social.support`)) +

geom\_boxplot(fill = "skyblue") +

labs(title = "Distribution of Social Support Across Different Regions",

y = "Country name", x = "Social Support") +

theme(axis.text.x = element\_text(angle = 45, hjust = 1, vjust = 1),

plot.title = element\_text(hjust = 0.5))

interactive\_box\_plot <- ggplotly(interactive\_box\_plot, tooltip = c("Country.name", "Social.support"))

print(interactive\_box\_plot)

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