# 615 Final Project

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## Running Library

This section outlines the necessary libraries and packages required for the project. It ensures that all tools and dependencies are ready to support data processing, visualization, and user interaction throughout the analysis.

```
library(shiny)
library(leaflet)
library(ggplot2)
library(tidyverse)
library(readr)
library(shinythemes)
library(tidyr)
library(dplyr)
```

## Load and Clean Data

This section focuses on the essential steps to prepare the dataset for analysis. It includes importing raw data, handling missing or inconsistent values, and structuring the data to align with the requirements of subsequent analyses. The goal is to create a clean and reliable foundation for meaningful insights.

```
# Load and Clean Data
data <- read_csv("cbd50a78-13f1-4476-ac61-5594a2439b18_Data.csv")

colnames(data)[5:ncol(data)] <- gsub("\\s\\[YR\\d{4}\\]", "", colnames(data)[5:ncol(data)])

# Define the indicators of interest
selected_indicators <- c('GDP (current US$)', 'GDP growth (annual %)')
#select_indicators <- c("Population change" = "Population, total",
#                               "Expected Age" = "Life expectancy at birth, total (years)")
```

```r
select_indicators <- c("Population, total","Life expectancy at birth, total (years)")

# Filter data
filtered_data <- data |>
                 filter(`Series Name` %in% selected_indicators) |>
                 select(-c(`Country Name`, `Country Code`, `Series Code`))
filter_data <- data |>
                 filter(`Series Name` %in% select_indicators) |>
                 select(-c(`Country Name`, `Country Code`, `Series Code`))

# Convert data to long format
long_data <- filtered_data |>
  pivot_longer(cols = `1973`:`2023`, names_to = "Year", values_to = "Value") |>
  mutate(
    Year = as.numeric(Year),
    Value = as.numeric(gsub("[^0-9.-]", "", Value))
  )

longer_data <- filter_data |>
  pivot_longer(cols = `1973`:`2023`, names_to = "Year", values_to = "Value") |>
  mutate(
    Year = as.numeric(Year),
    Value = as.numeric(gsub("[^0-9.-]", "", Value))
  )
#view(long_data)
#view(longer_data)
#write.csv(longer_data,"~/Downloads/filename.csv", row.names = FALSE)
```

## UI for Indonesia Analysis

### Introduction

This section provides a comprehensive overview of Indonesia, covering its **Geography and Population**, **Culture**, and **Economic Overview**. It sets the stage for deeper insights into Indonesia's socio-economic dynamics and visualizations.

### Interactive Map of Indonesia

Explore Indonesia interactively with a map that highlights key geographical and economic insights, enabling users to visualize regional trends effectively.

### Economic Indicators

This subsection delves into Indonesia's economic performance by presenting key metrics, such as GDP growth, trade balance, and industry contributions, helping to contextualize the nation's development trajectory.

### Population Statistics

A detailed analysis of Indonesia's demographic trends, including population distribution, growth rates, and age structure, offering a lens into the country's societal fabric and future challenges.

### UI for Comparison Analysis 2023

This component allows users to compare various socio-economic metrics of Indonesia with other countries or regions in 2023, fostering a better understanding of its global standing.

### SWOT Analysis

The **SWOT Analysis** highlights Indonesia's Strengths, Weaknesses, Opportunities, and Threats in economic and demographic contexts. This strategic assessment helps identify areas of growth and potential risks.

```
addResourcePath("images", "/Users/cc./Desktop/615 Final Project/www")

# UI for Indonesia Analysis
ui <- fluidPage(
  theme = shinytheme("flatly"),
  tags$style(HTML("\n    body { background-color: #f8f9fa; }\n    h3, h4 { color: #2c3e50; fo

  titlePanel(h1("Indonesia Analysis", align = "center", style = "color: #2980b9; font-weight

  navbarPage("Navigator",
    tabPanel("Introduction",
      fluidRow(
        column(6, wellPanel(
          h3("Geography and Population"),
          p(HTML("Indonesia, officially the <span class='highlight-red'>Republic of Indonesia
          p(HTML("Indonesia is the <span class='highlight-red'>world's largest archipelagic s
          p(HTML("With a population over <span class='highlight-red'>280 million people</spa
          p(HTML("<span class='highlight-blue'>Java</span>, the world's <span class='highlig
        )),
        column(6, align = "center",  # Add the image on the right-hand side
```

```
        img(src = "images/WechatIMG20.jpg", height = "500px", width = "90%", alt = "Indones
      )
    ),
    fluidRow(
      column(6, wellPanel(
        h3("Culture and Economic Overview"),
        p(HTML("Indonesia is home to hundreds of distinct <span class='highlight-blue'>ethn
        p(HTML("As a <span class='highlight-green'>newly industrialized country</span>, Ind
        p(HTML("It is the <span class='highlight-blue'>world's third-largest democracy</spa
        p(HTML("Indonesia is a member of key global organizations like the <span class='hig
      ))
    )
  ),

  tabPanel("Map",
    h3("Interactive Map of Indonesia"),
    leafletOutput("indonesiaMap", height = "500px")
  ),

  tabPanel("Economic Indicators",
    sidebarLayout(
      sidebarPanel(
        h4("Selected Indicator:"),
        selectInput("indicator", "Indicator", choices = selected_indicators),
        h4("Select Year:"),
        sliderInput("year", "Year Range:",
                    min = min(long_data$Year),
                    max = max(long_data$Year),
                    value = c(min(1990), max(long_data$Year)),
                    step = 1)
      ),
      mainPanel(
        h3(textOutput("plot_title")),
        plotOutput("gdp_plot")
      )
    )
  ),

  tabPanel("Population Statistics",
    sidebarLayout(
      sidebarPanel(
        h4("Select chart:"),
```

```
          selectInput("chart_type", "Type:", choices = select_indicators),
          h4("Select Year:"),
          sliderInput("yearpop", "Year Range:",
                      min = min(longer_data$Year),
                      max = max(longer_data$Year),
                      value = c(min(1990), max(longer_data$Year)),
                      step = 1)
          ),
        mainPanel(
          h3("Population Change Trend"),
          plotOutput("pop_plot")
          )
        )
      ),


    # UI for Comparison Analysis
tabPanel("Comparison Analysis for 2023",
      sidebarLayout(
        sidebarPanel(
          selectInput("selected_country", "Select Country for Comparison:",
                      choices = c("Singapore", "Philippines"))
        ),
        mainPanel(
          h3("GDP per Capita Comparison of Indonesia and Selected Country in 2023"),
          textOutput("comparison_text")
        )
      )
    ),


    tabPanel("SWOT Analysis",
  sidebarLayout(
    sidebarPanel(
      # Dropdown for selecting SWOT category
      selectInput("swot_category", "Select Category:",
                  choices = c("Strengths", "Weaknesses", "Opportunities", "Threats"),
                  selected = "Strengths")
    ),
    mainPanel(
      h3("SWOT analysis of Indonesia's Economic and Social Landscape", style = "font-weight:
      uiOutput("swot_content")
```

```
    )
  )
 )
  )
)
```

### Server logic

Including: Introduction(Geography and Population, Culture and Economic Overview), Interactive Map of Indonesia, Economic Indicators, Population Statistics, UI for Comparison Analysis 2023, SWOT Analysis.

This section explains the back-end implementation that powers the interactive features of the project. It covers server-side processing, data integration, and how requests from the user interface are handled efficiently.

```
# Server logic
server <- function(input, output) {

  # Interactive Map
  output$indonesiaMap <- renderLeaflet({
    leaflet() %>%
      addTiles() %>%
      addMarkers(
        lng = 106.8456, lat = -6.2088, popup = "Jakarta - Capital of Indonesia"
      ) %>%
      addMarkers(
        lng = 120.98, lat = -8.4095, popup = "Bali - Popular Tourist Destination"
      )
  })

  # Generate interactive bar chart
  output$gdp_plot <- renderPlot({
    # Filter data based on input
    filtered_plot <- long_data %>%
      filter(`Series Name` == input$indicator,
             Year >= input$year[1],
             Year <= input$year[2],
             !is.na(Value))  # Exclude NAs

    # Generate the vertical bar chart
    ggplot(filtered_plot, aes(x = Year, y = Value)) +
```

```
      geom_col(fill = "firebrick") +
      scale_y_continuous(limits = c(0, max(filtered_plot$Value, na.rm = TRUE))) +
      labs(
        x = "Year",
        y = input$indicator,
        title = paste(input$indicator, "over Selected Years")
      ) +
      theme_minimal() +
      theme(axis.text.x = element_text(angle = 45, hjust = 1))
  })

  # Render Population Statistics Line Chart
  output$pop_plot <- renderPlot({
    # Filter data based on input
    filter_plot <- longer_data %>%
      filter(`Series Name` == input$chart_type,
             Year >= input$yearpop[1],
             Year <= input$yearpop[2],
             !is.na(Value))  # Exclude NAs

      # Generate Line Chart
      ggplot(filter_plot, aes(x = Year, y = Value)) +
        geom_line(color = "steelblue", size = 1) +
        geom_point(color = "steelblue", size = 3) +
        labs(
          title = paste(input$chart_type, "Trend"),
          x = "Year",
          y = input$chart_type
        ) +
        theme_minimal() +
        theme(axis.text.x = element_text(angle = 45, hjust = 1))
    }
  )



  # Server Logic for Comparison Analysis
output$comparison_text <- renderText({

  # Simulated GDP data (replace these with actual values if available)
  indonesia_gdp <- 1390  # GDP for Indonesia in Billion USD
  gdp_data <- list(
```

```
    "Singapore" = 515,   # Singapore GDP in Billion USD
    "Philippines" = 450  # Philippines GDP in Billion USD
  )

  # Additional GDP growth and population data for analysis
  indonesia_gdp_growth <- 5
  singapore_gdp_growth <- 3
  philippines_gdp_growth <- 6

  indonesia_population <- 278   # Population in millions
  singapore_population <- 5.9   # Population in millions
  philippines_population <- 118 # Population in millions

  selected_country <- input$selected_country

  # Validate input selection
  if (is.null(selected_country)) return("Please select a country for comparison.")

  # Retrieve GDP for the selected country
  selected_gdp <- gdp_data[[selected_country]]

  # Compare GDP and generate dynamic text with bullet points
  comparison <- if (selected_country == "Singapore") {
    paste(
      "1. Indonesia has a much larger overall GDP of", indonesia_gdp, "billion USD compared t
      selected_gdp, "billion USD.",
      "\n 2. Singapore's GDP per capita is vastly higher, reflecting its highly urbanized and
      "\n 3. Despite Indonesia's higher GDP growth rate (~", indonesia_gdp_growth, "%), its l
    )
  } else if (selected_country == "Philippines") {
    paste(
      "1. Both Indonesia and the Philippines are emerging economies, but Indonesia has a larg
      indonesia_gdp, "billion USD compared to the Philippines' GDP of", selected_gdp, "billio
      "\n 2. The Philippines has a higher GDP growth rate (~", philippines_gdp_growth, "%), c
      "\n 3. Indonesia's larger population (", indonesia_population, " million) contrasts wit
    )
  } else {
    paste("No comparison data available for the selected country.")
  }

  return(comparison)
})
```

```
  # Server Logic: SWOT Analysis Content
output$swot_content <- renderUI({
  req(input$swot_category)  # Ensure input exists

  # Display content based on selected SWOT category
  if (input$swot_category == "Strengths") {
    tagList(
      h4("KEY STRENGTHS", style = "font-weight: bold;"),
      tags$ul(
        tags$li("The GDP (current US$) has shown a consistent upward trend, particularly afte
        tags$li("Despite occasional fluctuations, GDP growth (annual %) remains positive for
        tags$li("The total population has been steadily increasing, reaching approximately 27
        tags$li("Life expectancy at birth has consistently risen, reflecting healthcare impro
      )
    )
  } else if (input$swot_category == "Weaknesses") {
    tagList(
      h4("KEY WEAKNESSES", style = "font-weight: bold;"),
      tags$ul(
        tags$li("The GDP growth (annual %) chart highlights sharp declines in the early 2000s
        tags$li("Economic shocks and global crises significantly impact Indonesia's growth tr
        tags$li("The life expectancy chart shows a dip around 2005 and post-2020, suggesting
      )
    )
  } else if (input$swot_category == "Opportunities") {
    tagList(
      h4("KEY OPPORTUNITIES", style = "font-weight: bold;"),
      tags$ul(
        tags$li("Indonesia's growing population provides opportunities for a larger workforce
        tags$li("Economic diversification through technology, renewable energy, and trade par
        tags$li("Investing in healthcare systems and infrastructure can further enhance livin
      )
    )
  } else if (input$swot_category == "Threats") {
    tagList(
      h4("KEY THREATS", style = "font-weight: bold;"),
      tags$ul(
        tags$li("Fluctuations in global markets, pandemics, and economic shocks pose signific
        tags$li("Population pressure could strain infrastructure, employment, and resource ma
```

```
        tags$li("Vulnerabilities in the healthcare system limit the ability to effectively re
      )
    )
  }
})
}
```

## Reference

The final section lists all the resources and references utilized throughout the project, ensuring transparency and giving credit to sources of data, libraries, and inspiration.


https://databank.worldbank.org/reports.aspx?source=2&country=IDN#

https://en.wikipedia.org/wiki/Provinces_of_Indonesia

https://www.britannica.com/place/Indonesia

https://pixabay.com/images/search/bali/

https://pixabay.com/images/search/indonesia/

https://en.wikipedia.org/wiki/Philippines

https://en.wikipedia.org/wiki/Singapore