Samoa MA615 Final

Paul Moon

2024-12-15

```
library(shiny)
library(leaflet)
library(ggplot2)
library(plotly)
```

```
##
## Attaching package: 'plotly'
```

```
## The following object is masked from 'package:ggplot2':
##
##     last_plot
```

```
## The following object is masked from 'package:stats':
##
##     filter
```

```
## The following object is masked from 'package:graphics':
##
##     layout
```

```
library(DT)
```

```
##
## Attaching package: 'DT'
```

```
## The following objects are masked from 'package:shiny':
##
##     dataTableOutput, renderDataTable
```

```
# Load data from CSV file
samoa_data <- read.csv("samoa_historical_gdp.csv")

# Extend data to include projections to 2030
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(tidyr)
library(forecast)
```

```
## Registered S3 method overwritten by 'quantmod':
##   method            from
##   as.zoo.data.frame zoo
```

```
gdp_model <- lm(GDP.Nominal..Current.USD. ~ Year, data = samoa_data)
pop_model <- lm(Population ~ Year, data = samoa_data)

future_years <- data.frame(Year = seq(max(samoa_data$Year) + 1, 2030))

gdp_projection <- predict(gdp_model, newdata = future_years)
pop_projection <- predict(pop_model, newdata = future_years)

future_data <- future_years %>%
  mutate(
    GDP.Nominal..Current.USD. = gdp_projection,
    Population = pop_projection
  )

samoa_data_extended <- bind_rows(samoa_data, future_data)

ui <- fluidPage(
  titlePanel("Samoa Dashboard"),

  navbarPage(
    "Samoa Analysis",

    # Topic 1: General Description
    tabPanel(
      "General Description",
      fluidRow(
        column(6, leafletOutput("map_world")),
        column(6, leafletOutput("map_samoa"))
      ),
      fluidRow(
        column(12,
               h3("Key Facts About Samoa"),
               p(tags$b("Government:")),
               p("Samoa is a parliamentary democracy with a unicameral legislature called the Fono. The
               p(tags$b("Economy:")),
               p("Samoa's economy relies on agriculture, fisheries, tourism, and remittances. Major cha
               p(tags$b("People and Society:")),
               p("Samoa has a population of approximately 220,000, primarily ethnic Samoans, with a cul
```

```
                p(tags$b("Natural Environment:")),
                p("Samoa consists of two main islands (Upolu and Savai'i) with a tropical climate, rich
                p(tags$b("History:")),
                p("Inhabited for over 3,000 years, Samoa became independent in 1962 after periods of Ger
        )
      )
    ),

    # Topic 2: Projections
    tabPanel(
      "Projections",
      fluidRow(
        column(6, plotlyOutput("gdp_nominal_plot")),
        column(6, plotlyOutput("population_plot"))
      )
    ),

    # Topic 3: Regional Comparison
    tabPanel(
      "Regional Comparison",
      fluidRow(
        column(12, DTOutput("regional_comparison"))
      )
    ),
    # Topic 4: SWOT Analysis
    tabPanel(
      "SWOT Analysis",
      fluidRow(
        column(12, plotOutput("swot_chart"))
      )
    )
  )
)

server <- function(input, output, session) {
  # Map: Samoa in the World
  output$map_world <- renderLeaflet({
    leaflet() %>%
      addTiles() %>%
      setView(lng = 180, lat = -14, zoom = 2) %>%
      addMarkers(lng = 180, lat = -14, popup = "Samoa (in the South Pacific)")
  })

  # Map: Samoa Zoomed In
  output$map_samoa <- renderLeaflet({
    leaflet() %>%
      addTiles() %>%
      setView(lng = -172.1, lat = -13.8, zoom = 8) %>%
      addMarkers(lng = -172.1, lat = -13.8, popup = "Apia, Samoa")
  })

  # GDP Nominal Projection Plot
  output$gdp_nominal_plot <- renderPlotly({
```

```
    g <- ggplot(samoa_data_extended, aes(x = Year, y = GDP.Nominal..Current.USD.)) +
      geom_line(color = "blue") +
      geom_smooth(method = "lm", color = "red", linetype = "dashed") +
      labs(title = "GDP Nominal Projection", x = "Year", y = "GDP Nominal (USD)") +
      theme_minimal()
    ggplotly(g)
  })

  # Population Projection Plot
  output$population_plot <- renderPlotly({
    p <- ggplot(samoa_data_extended, aes(x = Year, y = Population)) +
      geom_line(color = "green") +
      geom_smooth(method = "lm", color = "red", linetype = "dashed") +
      labs(title = "Population Projection", x = "Year", y = "Population") +
      theme_minimal()
    ggplotly(p)
  })

  # Regional Comparison Table
  output$regional_comparison <- renderDT({
    data.frame(
      Country = c("Samoa", "Fiji", "Tonga", "Wallis and Futuna", "Tuvalu", "Tokelau", "Hawaii", "Niue"),
      `Distance (km)` = c(0, 1152, 889, 483, 1151, 519, 4190, 610),
      `GDP (Millions)` = c(1020, 5800, 581, 132, 66, 12, 89400, 35),
      Population = c(218019, 928784, 104175, 11277, 2551, 9646, 1432619, 1820),
      Year = rep(2024, 8)
    )
  })

  # SWOT Analysis Chart
  output$swot_chart <- renderPlot({
    library(ggplot2)

    ggplot() +
      annotate("rect", xmin = -1, xmax = 0, ymin = 0, ymax = 1, fill = "green", alpha = 0.2) +
      annotate("rect", xmin = -1, xmax = 0, ymin = -1, ymax = 0, fill = "red", alpha = 0.2) +
      annotate("rect", xmin = 0, xmax = 1, ymin = 0, ymax = 1, fill = "blue", alpha = 0.2) +
      annotate("rect", xmin = 0, xmax = 1, ymin = -1, ymax = 0, fill = "orange", alpha = 0.2) +
      geom_text(aes(x = 0, y = 0, label = "SWOT Analysis"), size = 8, fontface = "bold") +
      annotate("text", x = -0.5, y = 0.5, label = "Strengths:\n- Natural beauty\n- Rich culture\n- Stra
      annotate("text", x = -0.5, y = -0.5, label = "Weaknesses:\n- Tourism dependence\n- Disaster vulne
      annotate("text", x = 0.5, y = 0.5, label = "Opportunities:\n- Sustainable tourism\n- Renewable en
      annotate("text", x = 0.5, y = -0.5, label = "Threats:\n- Climate change\n- Overfishing\n- Economi
      coord_fixed() +
      theme_void()
  })
}

shinyApp(ui, server)
```