Developing Data Products - Programming Assignment - Week 2

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Executive Summary

The goal of the exercise is to create a map using Leaflet.

A map describing earth quakes info across the world between years 2000 and 2020 is created using Shiny and Leaflet. The map provides a hover feature that would display the magnitude, year and also place of the earth quake when mouse is on top of the earth quake circle. When clicked on the circle a standing out label with the info is diplayed. The years and the magnitude of the earth quakes can be selected using a slider range scale.

The earth quake data is obtained from https://earthquake.usgs.gov website and is downloaded ahead into the project directory.

Code

```r
# client - UI design
library(shiny)
library(shinyWidgets)
library(leaflet)

ui <- fluidPage(

    titlePanel("Earth Quakes"),
    h4("Date Created: 03/24/2020"),

    sidebarLayout(
        sidebarPanel(
            # slider for year range.
            sliderInput("year_range", "Year Range:",
                        min = 2000, max = 2020,
                        value = c(2010,2020), sep = ""),

            # slider for magnitude range.
            sliderInput("mag_range", "Magnitude Range:",
                        min = 5, max = 10,
                        value = c(6,10), step = 0.5),
        ),

        mainPanel(
            # display map with default width and height.
            leafletOutput("map")
        )
    )
)
```

```
# server - logic
library(leaflet)
library(tidyverse)
library(lubridate)
library(RColorBrewer)

server <- function(input, output, session) {

    # full data and color palette.
    data <- read_csv("world_earthquakes.csv")
    colorpal <- colorNumeric("YlOrRd", data$mag)

    # reactive data.
    filteredData <- reactive({
        data <- read_csv("world_earthquakes.csv") %>% filter(year(time) >= input$year_range[1] & year(ti
    })

    # draw and center view to north america
    output$map <- renderLeaflet({
        leaflet(data) %>%
            setView(lng = -99, lat = 42, zoom = 3)  %>%
            addTiles() %>%
            addCircles(
                lat = ~ latitude,
                lng = ~ longitude,
                color = "#777777",
                fillColor = ~colorpal(mag),
                fillOpacity = 0.5,
                radius = ~ exp(sqrt(mag))*mag*1000,
                weight = 1,
                popup = ~as.character(sprintf("Magnitude: %s<br>Year: %s<br>Place: %s", mag, year(time)
                label = ~as.character(sprintf("Magnitude: %s, Year: %s, Place: %s", mag, year(time), pla
            )
    })

    # redraw based on controllers.
    observe({
        leafletProxy("map", data = filteredData()) %>%
            clearShapes() %>%
            addCircles(
                lat = ~ latitude,
                lng = ~ longitude,
                color = "#777777",
                fillColor = ~colorpal(mag),
                fillOpacity = 0.5,
                radius = ~ exp(sqrt(mag))*mag*1000,
                weight = 1,
                popup = ~as.character(sprintf("Magnitude: %s<br>Year: %s<br>Place: %s", mag, year(time)
                label = ~as.character(sprintf("Magnitude: %s, Year: %s, Place: %s", mag, year(time), pla
        )
    })
}
```

Output

```r
shinyApp(ui, server)
```

Shiny applications not supported in static R Markdown documents