# Part 3. Analysis

## Task 4 and 6

Shiny Code

**UI Part**

```
library(ggplot2)

library(shiny)   # For nicer ggplot2 output when deployed on Linux


library(reshape2)

library(gridExtra)


ui <- shinyUI(fluidPage(

  titlePanel("Heat Maps comparision from CDC data and Twitter Data"),

  sidebarLayout(position = "left",

        sidebarPanel("sidebar panel",

              checkboxInput("donum1", "Heat Map", value = T),

              checkboxInput("donum2", "Twitter Data", value = F)



        ),

        mainPanel("main panel",

              column(6,plotOutput(outputId="plotgraph", width="800px",height="400px"))

        ))))
```

**Server Part**

```
server <- shinyServer(function(input, output)

{
```

```r
  pt1 <- reactive({

   if (!input$donum1) return(NULL)

   heat_map_df <- read.csv('heatmap.csv')

   heat_map_df <- heat_map_df[,c("STATENAME","ACTIVITY.LEVEL")]

   heat_map_df$region <- tolower(heat_map_df$STATENAME)

   #str(heat_map_df)

   heat_map_df$ACTIVITY.LEVEL <- as.numeric(heat_map_df$ACTIVITY.LEVEL)

   merged_dataframes<-merge(map_data("state"),heat_map_df, by="region")

   ggplot()+geom_polygon(data=merged_dataframes, aes(x=long, y=lat, group = group,
fill=merged_dataframes$ACTIVITY.LEVEL),colour="Black",lwd=.2) +

     scale_fill_continuous(low = "green", high = "red2", space = "Lab",na.value = "black",
guide="colorbar")

  })
  pt2 <- reactive({

   if (!input$donum2) return(NULL)

   merged_statecount1 <- read.csv("merged_statecount1.csv")

   p1 <- ggplot(merged_statecount1)

   p1<-p1+geom_map( map = map_data("state"), aes(map_id = merged_statecount1$region,fill =
merged_statecount1$text),colour = "black") +coord_map() +  labs(fill = "Tweets" ,title = "Twitter Data",
x="", y="")

   p1<-p1+expand_limits(x = map_data("state")$long, y = map_data("state")$lat)+ theme_bw()

   p1<-p1+scale_fill_continuous(low= "green", high="red3",  space =
"Lab",na.value="green3",guide="colorbar")

   p1<-p1+theme(panel.border =  element_blank())

   p1

  })


  output$plotgraph = renderPlot({

   ptlist <- list(pt1(),pt2())
```

```
# remove the null plots from ptlist and wtlist

to_delete <- !sapply(ptlist,is.null)

ptlist <- ptlist[to_delete]

if (length(ptlist)==0) return(NULL)

grid.arrange(grobs=ptlist,ncol=length(ptlist))


  })
})


shinyApp(ui=ui, server=server)
```

# Comparison of heat maps generated by the CDC flu data and Twitter data

From the above two plots we observe that the two plots plotted by the CDC data and the data collected by the tweets were shown

We see that for the state Kansas we got the highest number of tweets related to influenza and the CDC heat map confirms it by showing almost orange kind of color.

Here we observed that the two graphs are almost similar. The tweets collected are only for the year 2019, wheras the heat map is plotted for the entire year 2019.

The heat map we plotted for the month of January is almost same the same as the heat map we plotted for the tweets in the year 2019.

The Heat Map for the CDC data shows there are high number of cases of influenza at the northern states, when we compared with the states for the Southern States.

The heat map plotted by the influenza data shows that for the states New York, Michigan we observe high level of activity and the heat map plotted by tweets also has some activity.

Overall, these two plots gives us the level of influenza in U.S. These two plots shows us the enough information that tells us about the knowledge of tweets

URL: https://sowmithn.shinyapps.io/Sowmithheatmap/

References: https://stackoverflow.com/questions/34384907/how-can-put-multiple-plots-side-by-side-in-shiny-r/