```
################################################################################
#############

# UI Section of the Application

################################################################################
#############

library(shiny)


#######################################

# Add all the required Libraries

#######################################


library(shiny) # Shiny Library

library(plotly) # Plotly graphing librarry

library(highcharter) # Highcharter Libarry

library(shinydashboard) # Shiny Dashboard LIbrary

library(data.tree) # For data tables

library(treemap)

library(leaflet) # For maps and Choropleth

library(stringr)

library(shinyWidgets) # Shiny Widgets

library(dplyr) # Data Manipulation Library

library(shinythemes) # Shiny App themes



#######################################

# Read the dataset

#######################################



states_dataset <-

  read.csv("data/injured1.csv")
```

```
state_group <- states_dataset%>%
  group_by(state_name)%>%
  summarize(
    state_code=state_code,
    persons_killed_2014=persons_killed_2014,
    persons_killed_2015=persons_killed_2015,
    persons_killed_2016=persons_killed_2016,
    persons_killed_2017=persons_killed_2017,
    persons_injured_2014=persons_injured_2014,
    persons_injured_2015=persons_injured_2015,
    persons_injured_2016=persons_injured_2016,
    persons_injured_2017=persons_injured_2017,
    weather_normal=weather_normal,
    weather_mist_fog=weather_mist_fog,
    weather_cloudy=weather_cloudy,
    weather_rain=weather_rain,
    weather_flooding=weather_flooding,
    weather_hail_sleet=weather_hail_sleet,
    weather_snow=weather_snow,
    weather_dust_storm=weather_dust_storm,
    weather_other_extreme_conditions=weather_other_extreme_conditions,
    road_surfaced_road_acc=road_surfaced_road_acc,
    road_metalled_road_acc=road_metalled_road_acc,
    road_normalpucca_road_acc=road_normalpucca_road_acc,
    road_Kutcha_road_acc=road_Kutcha_road_acc,
    road_dry_road_acc=road_dry_road_acc,
    road_wet_road_acc=road_wet_road_acc,
    road_goodsurface_road_acc=road_goodsurface_road_acc,
    road_loosesurface_road_acc=road_loosesurface_road_acc,
    road_under_repair_road_acc=road_under_repair_road_acc,
    road_corrugated_road_acc=road_corrugated_road_acc,
```

```
  road_slippery_road_acc=road_slippery_road_acc,
  road_snowy_road_acc=road_snowy_road_acc,
  road_muddy_road_acc=road_muddy_road_acc,
  road_oily_road_acc=road_oily_road_acc,
  road_straight_road_acc=road_straight_road_acc,
  road_slightcurve_road_acc=road_slightcurve_road_acc,
  road_flat_road_acc=road_flat_road_acc,
  road_gentleincline_road_acc=road_gentleincline_road_acc,
  road_hump_road_acc=road_hump_road_acc,
  road_dip_road_acc=road_dip_road_acc,
  road_pothole_road_acc=road_pothole_road_acc,
  road_speedbreaker_road_acc=road_speedbreaker_road_acc,
  road_steepincline_road_acc=road_steepincline_road_acc,
  road_sharpcurve_road_acc=road_sharpcurve_road_acc,
  road_earthernshoulderedgedrop_road_acc=road_earthernshoulderedgedrop_road_acc,
  road_other_road_acc=road_other_road_acc,
  vehicle_defect_brakes=vehicle_defect_brakes,
  vehicle_defect_steering=vehicle_defect_steering,
  vehicle_defect_puncturedbursttyres=vehicle_defect_puncturedbursttyres,
  vehicle_defect_baldtyres=vehicle_defect_baldtyres,
  vehicle_defect_wornouttyres=vehicle_defect_wornouttyres,
  vehicle_defect_othermechanical=vehicle_defect_othermechanical,
  lat=lat,
  lng=lng
 )


state_group$state_name <-
  as.character(state_group$state_name)
#######################################
# Arrange and group by state
```

```
#######################################

#######################################
# Download India Map GeoJson file
#######################################
mapdata <-
  get_data_from_map(download_map_data("countries/in/custom/in-all-andaman-and-nicobar"))

#######################################
# Correcting the data to match the data frames
#######################################



state_group$state_name <- as.factor(state_group$state_name)
# Get the codes for all the states
hcmap.state_codes <-
  dplyr::select(filter(
    mapdata,
    tolower(mapdata$name) %in% tolower(state_group$state_name)
  ), c("hc-a2", "name"))
hcmap.state_codes$name <- toupper(hcmap.state_codes$name)
state_group$state_name <- toupper(state_group$state_name)
# Merge the codes with the cities dataset
states_dataset.merge <-
  merge(state_group,
        hcmap.state_codes,
        by.x = "state_name",
        by.y = "name")

states_dataset.merge$state_name <-
  as.factor(states_dataset.merge$state_name)
```

```
state_group$state_name <- as.factor(state_group$state_name)
state_group$lng <- as.numeric(state_group$lng)
state_group$lat <- as.numeric(state_group$lat)

spllitted_cities <- split(states_dataset, states_dataset$state_code)

by_state_order <-
  state_group[order(state_group$state_name), ]

state_group$state_name <- as.factor(state_group$state_name)




# Uniques State names
states.names <- unique(as.character(state_group$state_name))

# Converting state codes to factors
states_dataset$state_code <- as.factor(states_dataset$state_code)

# Finding unique state codes
states.codes <- unique(states_dataset$state_code)
road <- read.csv(file = "data/injured1.csv")

# INput Choices for Prediction Tab
input_choices <- c("Defective.Steering", "Punctured.burst.Tyres", "Bald.Tyres",
"Other.serious.mechanical.defect", "Metalled.Roads", "Pucca.road..Normal.Road.", "Kutcha.Roads",
"Loose.Surface", "Road.under.repair.construction", "Corrugated.Wavy.road", "Snowy", "Muddy",
"Slight.Curve", "Flat.Road", "Gentle.Incline", "Pot.Holes", "Speed.Breaker", "Steep.Incline",
"Sharp.Curve", "Others.road.conditions")
```

```
# Options Names to display values on Map
var <- c(
  "Persons Killed in Road Accidents: 2014" = "p10",
  "Persons Killed in Road Accidents: 2015" = "p11",
  "Persons Killed in Road Accidents: 2016" = "p12",
  "Persons Killed in Road Accidents: 2017" = "p13",
  "Persons Injured in Road Accidents: 2014" = "p14",
  "Persons Injured in Road Accidents: 2015" = "p15",
  "Persons Injured in Road Accidents: 2016" = "p16",
  "Persons Injured in Road Accidents: 2017" = "p17"

)

list_select <- c(
  "Number of Persons Killed in Road Accidents during - 2014" = 1,
  "Number of Persons Killed in Road Accidents during - 2015" = 2,
  "Number of Persons Killed in Road Accidents during - 2016" = 3,
  "Number of Persons Killed in Road Accidents during - 2017" = 4,
  "Number of Persons Injured in Road Accidents during - 2014" = 5,
  "Number of Persons Injured in Road Accidents during - 2015" = 6,
  "Number of Persons Injured in Road Accidents during - 2016" = 7,
  "Number of Persons Injured in Road Accidents during - 2017" = 8

)

map.view.options.names <-
  c(
    "Number of Persons Killed in Road Accidents during - 2014",
    "Number of Persons Killed in Road Accidents during - 2015",
    "Number of Persons Killed in Road Accidents during - 2016",
```

"Number of Persons Killed in Road Accidents during - 2017",

"Number of Persons Injured in Road Accidents during - 2014",

"Number of Persons Injured in Road Accidents during - 2015",

"Number of Persons Injured in Road Accidents during - 2016",

"Number of Persons Injured in Road Accidents during - 2017",

"Road Accidents due to Weather Condition: Fine/Clear ",

"Road Accidents due to Weather Condition: Mist/Foggy ",

"Road Accidents due to Weather Condition: Cloudy ",

"Road Accidents due to Weather Condition: Rainy ",

"Road Accidents due to Weather Condition: Flooding ",

"Road Accidents due to Weather Condition: Hail/Sleet ",

"Road Accidents due to Weather Condition: Snow ",

"Road Accidents due to Weather Condition: Dust Storm ",

"Road Accidents due to Weather Condition: Other Extreme Weather Conditions ",

"Road Accidents due to Road Condition: Surfaced ",

"Road Accidents due to Road Condition: Metalled ",

"Road Accidents due to Road Condition: Normal / Pucca ",

"Road Accidents due to Road Condition: Kutcha ",

"Road Accidents due to Road Condition: Dry ",

"Road Accidents due to Road Condition: Wet ",

"Road Accidents due to Road Condition: Good Surface ",

"Road Accidents due to Road Condition: Loose Surface ",

"Road Accidents due to Road Condition: Under Construction/Repairing ",

"Road Accidents due to Road Condition: Corrugated ",

"Road Accidents due to Road Condition: Slippery ",

"Road Accidents due to Road Condition: Snowy ",

"Road Accidents due to Road Condition: Muddy ",

"Road Accidents due to Road Condition: Oily ",

"Road Accidents due to Road Condition: Straight ",

"Road Accidents due to Road Condition: SlightCurve ",

"Road Accidents due to Road Condition: Flat ",

```
  "Road Accidents due to Road Condition: Gentle Incline ",
  "Road Accidents due to Road Condition: Humps ",
  "Road Accidents due to Road Condition: Dip ",
  "Road Accidents due to Road Condition: Pot Holes ",
  "Road Accidents due to Road Condition: Speed breaker ",
  "Road Accidents due to Road Condition: Steep Incline ",
  "Road Accidents due to Road Condition: Sharp Curve ",
  "Road Accidents due to Road Condition: Earthern Shoulder Edge Drop ",
  "Road Accidents due to Road Condition: Others ",
  "Road Accidents due to Vehicle Condition: Defective Brakes ",
  "Road Accidents due to Vehicle Condition: Defective Steering ",
  "Road Accidents due to Vehicle Condition: Defective Punctured/Burst Tyres ",
  "Road Accidents due to Vehicle Condition: Defective Bald Tyres ",
  "Road Accidents due to Vehicle Condition: Defective Worn Out tyres ",
  "Road Accidents due to Vehicle Condition: Other Mechanical Defects "
 )

# Options Values to display values on Map
map.view.options.values <-
 c(

  "persons_killed_2014",
  "persons_killed_2015",
  "persons_killed_2016",
  "persons_killed_2017",
  "persons_injured_2014",
  "persons_injured_2015",
  "persons_injured_2016",
  "persons_injured_2017",
  "weather_normal",
  "weather_mist_fog",
```

"weather_cloudy",

"weather_rain",

"weather_flooding",

"weather_hail_sleet",

"weather_snow",

"weather_dust_storm",

"weather_other_extreme_conditions",

"road_surfaced_road_acc",

"road_metalled_road_acc",

"road_normalpucca_road_acc",

"road_Kutcha_road_acc",

"road_dry_road_acc",

"road_wet_road_acc",

"road_goodsurface_road_acc",

"road_loosesurface_road_acc",

"road_under_repair_road_acc",

"road_corrugated_road_acc",

"road_slippery_road_acc",

"road_snowy_road_acc",

"road_muddy_road_acc",

"road_oily_road_acc",

"road_straight_road_acc",

"road_slightcurve_road_acc",

"road_flat_road_acc",

"road_gentleincline_road_acc",

"road_hump_road_acc",

"road_dip_road_acc",

"road_pothole_road_acc",

"road_speedbreaker_road_acc",

"road_steepincline_road_acc",

"road_sharpcurve_road_acc",

```
    "road_earthernshoulderedgedrop_road_acc",
    "road_other_road_acc",
    "vehicle_defect_brakes",
    "vehicle_defect_steering",
    "vehicle_defect_puncturedbursttyres",
    "vehicle_defect_baldtyres",
    "vehicle_defect_wornouttyres",
    "vehicle_defect_othermechanical"

  )

# Options Icons to display values on Map
map.view.options.icons <- c(
  "icon1.png",
  "icon2.png",
  "icon3.png",
  "icon4.png",
  "icon5.png",
  "icon6.png",
  "icon7.png",
  "icon8.png",
  "icon9.png",
  "icon10.png",
  "icon11.png",
  "icon12.png"
)

# Radio Button names to switch between Map and Choreopleth
top.states.names <- c("All States View")

# Radio Button values to switch between Map and Choreopleth
```

```
top.states.values <- c("all_view")

# Radio Button icons to switch between Map and Choreopleth
top.states.icons <- c("icon14.png")



navbarPage(
 "Road Accident Analysis and Visualization of India",
 id = "nav",
 theme = shinytheme("flatly"),

 # Tab 1- Interactive Map
 tabPanel(
  "Interactive Spatial map",
  div(
   class = "outer",

   tags$head(# Include the custom CSS
    includeCSS("styles.css"),
    includeScript("gomap.js")),

   # Leaflet Library Map
   leafletOutput("tab1_leaflet_map", width = "100%", height = "100%"),

   # Right Filter Panel for drop-down and the graph
   absolutePanel(
    id = "controls",
    class = "panel panel-default",
    fixed = TRUE,
    draggable = TRUE,
    top = 80,
```

```
left = "auto",
right = 20,
bottom = "auto",
width = 490,
height = 870,

# Dropdown Header
h2("Choose State"),

# Initializing the dropdown
selectInput(
  "tab1_dropdown_states",
  NULL,
  c(
    "ALL STATES" = "All",
    structure(
      by_state_order$state_code,
      names = as.character(by_state_order$state_name)
    )
  )
),

# Initializing all the value boxes
valueBoxOutput("tab1_valuebox_persons_killed_2014", width = 6),
valueBoxOutput("tab1_valuebox_persons_killed_2015", width = 6),
valueBoxOutput("tab1_valuebox_persons_killed_2016", width = 6),
valueBoxOutput("tab1_valuebox_persons_killed_2017", width = 6),

# Initializing the polar chart/ spider chart

highchartOutput("tab1_polar_plot", height = 400)
```

```
    )
   )
  ),
  # Tab 2 - MAP
  tabPanel(title="Injured/Killed Distribution", sidebarLayout(
    sidebarPanel(
      radioButtons(inputId = "state",label="",choices = c("State"=1)),p(),
      selectInput("selectMap", label ="Select Statistic",
                  choices = var,
                  selected = 1),p()),
    mainPanel(leafletOutput("mymap",height = 700))
  )),
 # Tab 3- Data Table
 tabPanel(
  "Dataset",
  box(
    title = "Road Accident Dataset",
    width = 12,
    status = "primary",
    height = "850",
    solidHeader = T,
    DT::dataTableOutput("state_group", height = 800)
  )
 ),
 # Tab 4- Different type of plots
 tabPanel(
  "Plots",
  tags$head(tags$style(HTML(
    "
    div#checkGroup {
```

```
  font-size: 75%;
  }
  "
))),
sidebarLayout(

  # Left Sidbar State Filter Panel
  sidebarPanel(
    h4("Select States"),
    checkboxInput('all.none', 'All/None', value = F),
    checkboxGroupInput(
      "state.checkbox.filter",
      label = NULL,
      choiceNames = as.character(by_state_order$state_name),
      choiceValues = by_state_order$state_code,
      selected = c(35, 28, 22, 34, 3, 8, 19, 21, 20)
    )
    ,
    width = 2
  ),

  mainPanel(box(
    tabsetPanel(

      tabPanel(
        "Bar Plots: Total Accidents",
        fluidRow(
          column(
            6,
            box(
              title = "Frequency Plot of Number of Persons injured in 2014",
```

```
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart1", height = "320px")
    ,
    width = 12
  )
),
column(
  6,
  box(
    title = "Frequency Plot of Number of Persons injured in 2015",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart2", height = "320px"),
    width = 12
  )
)),fluidRow(
  column(
    6,
    box(
      title = "Frequency Plot of Number of Persons injured in 2016",
      status = "primary",
      solidHeader = TRUE,
      highchartOutput("tab4_column_chart3", height = "320px")
      ,
      width = 12
    )
  ),
  column(
    6,
    box(
```

```
    title = "Frequency Plot of Number of Persons injured in 2017",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart4", height = "320px"),
    width = 12
   )
  )),fluidRow(
   column(
    6,
    box(
     title = "Frequency Plot of Number of Persons Killed in 2014",
     status = "primary",
     solidHeader = TRUE,
     highchartOutput("tab4_column_chart5", height = "320px")
     ,
     width = 12
    )
   ),
   column(
    6,
    box(
     title = "Frequency Plot of Number of Persons Killed in 2015",
     status = "primary",
     solidHeader = TRUE,
     highchartOutput("tab4_column_chart6", height = "320px"),
     width = 12
    )
   )),fluidRow(
    column(
     6,
     box(
```

```
          title = "Frequency Plot of Number of Persons Killed in 2016",
          status = "primary",
          solidHeader = TRUE,
          highchartOutput("tab4_column_chart7", height = "320px")
          ,
          width = 12
        )
      ),
      column(
        6,
        box(
          title = "Frequency Plot of Number of Persons Killed in 2017",
          status = "primary",
          solidHeader = TRUE,
          highchartOutput("tab4_column_chart8", height = "320px"),
          width = 12
        )
      ))
),
tabPanel(
  "Bar Plots: Weather Condition",
  fluidRow(column(
    6,
    box(
      title = " Weather Condition: Fine/Clear",
      status = "primary",
      solidHeader = TRUE,
      highchartOutput("tab4_column_chart21", height = "320px")
      ,
      width = 12
    )
```

```
),
column(
 6,
 box(
  title = "Weather Condition: Mist/Foggy",
  status = "primary",
  solidHeader = TRUE,
  highchartOutput("tab4_column_chart22", height = "320px"),
  width = 12
 )
)),
fluidRow(column(
 6,
 box(
  title = "Weather Condition: Cloudy",
  status = "primary",
  solidHeader = TRUE,
  highchartOutput("tab4_column_chart23", height = "320px")
  ,
  width = 12
 )
),
column(
 6,
 box(
  title = "Weather Condition: Rainy",
  status = "primary",
  solidHeader = TRUE,
  highchartOutput("tab4_column_chart24", height = "320px"),
  width = 12
 )
```

```
)),
fluidRow(column(
  6,
  box(
    title = "Weather Condition: Flooding",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart25", height = "320px")
    ,
    width = 12
  )
),
column(
  6,
  box(
    title = "Weather Condition: Hail/Sleet",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart26", height = "320px"),
    width = 12
  )
)),
fluidRow(column(
  6,
  box(
    title = "Weather Condition: Snow",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart27", height = "320px")
    ,
    width = 12
```

```
    )
  ),
  column(
    6,
    box(
      title = "Weather Condition: Dust Storm",
      status = "primary",
      solidHeader = TRUE,
      highchartOutput("tab4_column_chart28", height = "320px"),
      width = 12
    )
  )),
  fluidRow(column(
    6,
    box(
      title = "Weather Condition: Other Extreme Weather Conditions",
      status = "primary",
      solidHeader = TRUE,
      highchartOutput("tab4_column_chart29", height = "320px")
      ,
      width = 12
    )
  ))
),

tabPanel(
  "Bar Plots: Road Condition",
  fluidRow(column(
    6,
    box(
      title = "Road Condition: Surfaced",
```

```
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart31", height = "320px")
    ,
    width = 12
  )
),
column(
  6,
  box(
    title = "Road Condition: Metalled",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart32", height = "320px"),
    width = 12
  )
)),
fluidRow(column(
  6,
  box(
    title = "Road Condition: Normal / Pucca",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart33", height = "320px")
    ,
    width = 12
  )
),
column(
  6,
  box(
```

```
    title = "Road Condition: Kutcha",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart34", height = "320px"),
    width = 12
  )
)),
fluidRow(column(
  6,
  box(
    title = "Road Condition: Dry",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart35", height = "320px")
    ,
    width = 12
  )
),
column(
  6,
  box(
    title = "Road Condition: Wet",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart36", height = "320px"),
    width = 12
  )
)),
fluidRow(column(
  6,
  box(
```

```
    title = "Road Condition: Good Surface",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart37", height = "320px")
    ,
    width = 12
  )
),
column(
  6,
  box(
    title = "Road Condition: Loose Surface",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart38", height = "320px"),
    width = 12
  )
)),
fluidRow(column(
  6,
  box(
    title = "Road Condition: Under Construction/Repairing",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart39", height = "320px")
    ,
    width = 12
  )
),
column(
  6,
```

```
  box(
    title = "Road Condition: Corrugated",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart40", height = "320px"),
    width = 12
  )
)),
fluidRow(column(
  6,
  box(
    title = "Road Condition: Slippery",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart41", height = "320px")
    ,
    width = 12
  )
),
column(
  6,
  box(
    title = "Road Condition: Snowy",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart42", height = "320px"),
    width = 12
  )
)),
fluidRow(column(
  6,
```

```
  box(
    title = "Road Condition: Muddy",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart43", height = "320px")
    ,
    width = 12
  )
),
column(
  6,
  box(
    title = "Road Condition: Oily",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart44", height = "320px"),
    width = 12
  )
)),
fluidRow(column(
  6,
  box(
    title = "Road Condition: Straight",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart45", height = "320px")
    ,
    width = 12
  )
),
column(
```

```
  6,
  box(
    title = "Road Condition: Slight Curve",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart46", height = "320px"),
    width = 12
  )
)),
fluidRow(column(
  6,
  box(
    title = "Road Condition: Flat",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart47", height = "320px")
    ,
    width = 12
  )
),
column(
  6,
  box(
    title = "Road Condition: Gentle Incline",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart48", height = "320px"),
    width = 12
  )
)),
fluidRow(column(
```

```
  6,
  box(
    title = "Road Condition: Humps",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart49", height = "320px")
    ,
    width = 12
  )
),
column(
  6,
  box(
    title = "Road Condition: Dip",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart50", height = "320px"),
    width = 12
  )
)),
fluidRow(column(
  6,
  box(
    title = "Road Condition: Pot Holes",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart51", height = "320px")
    ,
    width = 12
  )
),
```

```
column(
  6,
  box(
    title = "Road Condition: Speed breaker",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart52", height = "320px"),
    width = 12
  )
)),
fluidRow(column(
  6,
  box(
    title = "Road Condition: Steep Incline",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart53", height = "320px")
    ,
    width = 12
  )
),
column(
  6,
  box(
    title = "Road Condition: Sharp Curve",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart54", height = "320px"),
    width = 12
  )
)
```

```
  ),
  fluidRow(column(
    6,
    box(
      title = "Road Condition: Earthern Shoulder Edge Drop",
      status = "primary",
      solidHeader = TRUE,
      highchartOutput("tab4_column_chart55", height = "320px")
      ,
      width = 12
      )
    ),
    column(
      6,
      box(
        title = "Road Condition: Others",
        status = "primary",
        solidHeader = TRUE,
        highchartOutput("tab4_column_chart56", height = "320px"),
        width = 12
      )
    ))
),

tabPanel(
  "Bar Plots: Vehicle Condition",
  fluidRow(column(
    6,
    box(
      title = "Vehicle Condition: Defective Brakes",
      status = "primary",
```

```
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart61", height = "320px")
    ,
    width = 12
  )
),
column(
  6,
  box(
    title = "Vehicle Condition: Defective Steering",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart62", height = "320px"),
    width = 12
  )
)),
fluidRow(column(
  6,
  box(
    title = "Vehicle Condition: Defective Punctured/Burst Tyres",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart63", height = "320px")
    ,
    width = 12
  )
),
column(
  6,
  box(
    title = "Vehicle Condition: Defective Bald Tyres",
```

```
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart64", height = "320px"),
    width = 12
   )
  )),
  fluidRow(column(
   6,
   box(
    title = "Vehicle Condition: Defective Worn Out tyres",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart65", height = "320px")
    ,
    width = 12
   )
  ),
  column(
   6,
   box(
    title = "Vehicle Condition: Other Mechanical Defects",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_column_chart66", height = "320px"),
    width = 12
   )
  ))
),
```

```
tabPanel(
 "Heat Map",
 fluidRow(column(
  6,
  box(
   title = "Number of Persons Killed in 2014",
   status = "primary",
   solidHeader = TRUE,
   highchartOutput("tab4_heatmap_chart1", height = "320px")
   ,
   width = 12
  )
 ),
 column(
  6,
  box(
   title = "Number of Persons Killed in 2015",
   status = "primary",
   solidHeader = TRUE,
   highchartOutput("tab4_heatmap_chart2", height = "320px"),
   width = 12
  )
 )),
 fluidRow(column(
  6,
  box(
   title = "Number of Persons Killed in 2016",
   status = "primary",
   solidHeader = TRUE,
   highchartOutput("tab4_heatmap_chart3", height = "320px")
   ,
```

```
    width = 12
  )
),
column(
  6,
  box(
    title = "Number of Persons Killed in 2017",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_heatmap_chart4", height = "320px"),
    width = 12
  )
))
,
fluidRow(column(
  6,
  box(
    title = "Number of Persons injured in 2014",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_heatmap_chart5", height = "320px")
    ,
    width = 12
  )
),
column(
  6,
  box(
    title = "Number of Persons injured in 2015",
    status = "primary",
    solidHeader = TRUE,
```

```
    highchartOutput("tab4_heatmap_chart6", height = "320px"),
    width = 12
   )
  )),

  fluidRow(column(
   6,
   box(
    title = "Number of Persons injured in 2016",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_heatmap_chart7", height = 320)
    ,
    width = 12
   )
  ),
  column(
   6,
   box(
    title = "Number of Persons injured in 2017",
    status = "primary",
    solidHeader = TRUE,
    highchartOutput("tab4_heatmap_chart8", height = 320),
    width = 12
   )
  ))
),



tabPanel(
```

```
"Line Graphs",
fluidRow(column(
 6,
 box(
  title = "Persons injured 2014 vs Persons injured 2015 vs Persons injured 2016 vs Persons injured 2017",
  status = "primary",
  solidHeader = TRUE,
  highchartOutput("tab4_line_chart1", height = "320px")
  ,
  width = 12
 )
),column(
 6,
 box(
  title = "Persons Killed 2014 vs Persons Killed 2015 vs Persons Killed 2016 vs Persons Killed 2017",
  status = "primary",
  solidHeader = TRUE,
  highchartOutput("tab4_line_chart2", height = "320px")
  ,
  width = 12
 )
 )
),
fluidRow(column(
 6,
 box(
  title = "Weather : Fine/Normal vs Mist/Foggy vs Cloudy vs Rainy",
  status = "primary",
  solidHeader = TRUE,
  highchartOutput("tab4_line_chart3", height = "320px")
```

```
  ,
  width = 12
 )
),column(
 6,
 box(
  title = "Weather : Hail/Sleet vs Snow vs Dust Storm vs Flooding vs Others",
  status = "primary",
  solidHeader = TRUE,
  highchartOutput("tab4_line_chart4", height = "320px"),
  width = 12
 )
)),
fluidRow(column(
 6,
 box(
  title = "Road : Surfaced vs Metalled vs Normal/Pucca vs Kutcha vs Dry",
  status = "primary",
  solidHeader = TRUE,
  highchartOutput("tab4_line_chart5", height = "320px")
  ,
  width = 12
 )
),column(
 6,
 box(
  title = "Road : Wet vs Good Surface vs Loose Surface vs Under Construction vs Corrugated",
  status = "primary",
  solidHeader = TRUE,
  highchartOutput("tab4_line_chart6", height = "320px"),
  width = 12
```

```
  )
 )),
 fluidRow(column(
  6,
  box(
   title = "Road : Slippery vs Snowy vs Muddy vs Oily vs Straight",
   status = "primary",
   solidHeader = TRUE,
   highchartOutput("tab4_line_chart7", height = "320px")
   ,
   width = 12
  )
 ),column(
  6,
  box(
   title = "Road : Slight Curve vs Flat vs Gentle Incline vs Humps vs Dip",
   status = "primary",
   solidHeader = TRUE,
   highchartOutput("tab4_line_chart8", height = "320px"),
   width = 12
  )
 )),
 fluidRow(column(
  6,
  box(
   title = "Road : Pot Holes vs Speed breaker vs Steep Incline vs Sharp Curve vs Earthern vs
Others",
   status = "primary",
   solidHeader = TRUE,
   highchartOutput("tab4_line_chart9", height = "320px")
   ,
```

```
          width = 12
        )
      ),column(
        6,
        box(
          title = "Vehicle Condition: Defective Brakes vs Steering vs Punctured/Burst Tyres",
          status = "primary",
          solidHeader = TRUE,
          highchartOutput("tab4_line_chart10", height = "320px"),
          width = 12
        )
      )),
      fluidRow(column(
        6,
        box(
          title = "Vehicle Condition: Defective Bald Tyres vs Worn Out Tyres vs Other Mechanical
Defects",
          status = "primary",
          solidHeader = TRUE,
          highchartOutput("tab4_line_chart11", height = "320px")
          ,
          width = 12
        )
      )
      )
    )

  ),
  width = 12
 ), width = 10)
)
```

```
),
##Tab 5
tabPanel(
  "Conditons Causing Accidents",
  dashboardPage(
    dashboardHeader(disable = T),
    dashboardSidebar(disable = T),
    dashboardBody(
      tags$script(
        'window.onload = function() {
          function fixBodyHeight() {
          var el = $(document.getElementsByClassName("content-wrapper")[0]);
          var h = el.height();
          el.css("min-height", h + 50 + "px");
          };
          window.addEventListener("resize", fixBodyHeight);
          fixBodyHeight();
          };'
      ),
      fluidRow(
        box(
          # Radio button to switch between two Map Types
          radioButtons(
            "map.type.filter",
            "",
            choiceNames = mapply(
              top.states.names,
              top.states.icons,
              FUN = function(state, iconUrl) {
                tagList(tags$img(
                  src = iconUrl,
```

```
        width = 35,
        height = 35
       ),
       state)
     },
     SIMPLIFY = FALSE,
     USE.NAMES = FALSE
    ),
    choiceValues = top.states.values
  ),
  width = 2
),

column(width = 1),

# Initializing the Highcharter Map
column(highchartOutput("tab2_bubble_map", height = "800px"),
       width = 6),

# Right Panel different attribute filters
box(
  radioButtons(
    "attribute.filters",
    "",
    choiceNames = mapply(
      map.view.options.names,
      map.view.options.icons,
      FUN = function(country, flagUrl) {
        tagList(tags$img(
          src = flagUrl,
          width = 0,
```

```
              height = 0
            ),
            country)
          },
          SIMPLIFY = FALSE,
          USE.NAMES = FALSE
        ),
        choiceValues = map.view.options.values
      ),
      width = 3
    )
  )
 )
),

#####################################
#       TAB 6 PREDICTION        #
#####################################

tabPanel(
 "Prediction",
 tags$head(tags$style(HTML(
  "
  div#checkGroup {
  font-size: 75%;
  }
  "
 ))),
 sidebarLayout(
  # Left Sidbar State Filter Panel
```

```
sidebarPanel(
 h4("Select States"),
 selectInput(
  "tab5_dropdown_states",
  NULL,
  c(
   structure(
    by_state_order$state_code,
    names = as.character(by_state_order$state_name)
   )
  )
 ),
 checkboxGroupInput(
  "choice.checkbox.filter",
  label = NULL,
  choiceNames = input_choices,
  choiceValues = input_choices
 )
 ,
 width = 3
),
mainPanel(box(
 tabsetPanel(
  tabPanel(
   fluidRow(column(
    8,
    box(
     title = "Predicted risk:",

     solidHeader = TRUE,
     width = 12
```

```
          )
        ),
        column(
          9,offset=2,
          box(
            status = "primary",
            solidHeader = FALSE,
            span(textOutput("prediction"), style="font-size:30px;color:blue"),
            width = 30
          )
        )
        )
      )
    )
  ))
 )
),

 conditionalPanel("false", icon("crosshair"))
)
```