MATH2270 Assignment 3

Interactive Storytelling

Student Details

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Story URL

- Charis Chang. (2018, September 1). The Australians at risk of becoming 'mortgage prisoners'. Retrieved from https://www.news.com.au/finance/money/costs/the-australians-at-risk-of-becoming-mortgage-prisoners/news-story/f8f3bd92868dab66280bd23c6315868c

Data Source

- Australian Bureau of Statistics. (2018). 5609.0 - Housing Finance, Australia, July 2018. Available online at: http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/5609.0July%202018?OpenDocument.

Visualisation URL

https://udeshikadissa.shinyapps.io/AUS_HOUSING/

Code

```
# Load packages and prepare data

library(ggplot2)
library(shiny)
library(plotly)
library(tidyr)    # Restructuring original datasets (from wide to long format)
library(dplyr)    # Data manipulation (factor levels, labels etc.)
library(RColorBrewer)
library(xlsx)   # Data loading

#Load data
housing_com <- read.xlsx("housing_commitments.xlsx",sheetIndex = 2)
housing_com$State <- factor(housing_com$State,
                            levels
=c("NSW","VIC","QLD","SA","WA","TAS","ACT","NT"),
                            ordered = TRUE)
housing_com <- housing_com %>% filter(Year>1992,Year<2018)
housing3 <- housing_com %>% select(Year,State,TOTAL,ave_financing:ave_addition)
housing3 <- housing3 %>% gather(key="Purpose", value ="Amount", 4:6)
housing3$Purpose <- factor(housing3$Purpose,
                           levels = c("ave_financing",
                                      "ave_refinancing",
                                      "ave_addition"),
                           labels = c("Financed excluding refinancing",
                                      "Refinancing of established dwellings",
                                      "Alterations and additions"),
                           ordered = TRUE)
#for line plot 1
housing4 <- housing3%>% group_by(Year,Purpose) %>%
summarise(total=round(sum(Amount,na.rm = TRUE)/7,3))
```

```
#for line plot 2

housing5 <- housing_com %>%
select(Year,State,TOTAL,Y_Y_Change_financing:Y_Y_Change_additon)
housing5 <- housing5 %>% gather(key="Purpose", value ="Growth", 4:6)
housing5$Purpose <- factor(housing5$Purpose,
                           levels = c("Y_Y_Change_financing",
                                      "Y_Y_Change_refinancing",
                                      "Y_Y_Change_additon"),
                           labels = c("Financed excluding refinancing",
                                      "Refinancing of established dwellings",
                                      "Alterations and additions"),
                           ordered = TRUE)
housing5 <- left_join(housing3,housing5,by=c("Year", "State","TOTAL",
"Purpose"))

# Assign server function

server5 <- function(input, output) {

  output$selected_year <- renderText({
    paste("Year", input$Year)   })

  output$selected_purpose <- renderText({
    paste("Purpose", input$Purpose)   })


  #scatter plot
  output$scatter <- renderPlotly({
    ggplotly(ggplot(housing5,aes(x = TOTAL, y = Amount, fill =
State,stroke=0.2)) +
                       geom_point(data = filter(housing5,

Purpose==input$Purpose,Year==input$Year),
                                  alpha=0.7)+
               aes(size=Growth)+
               scale_size(name = "")+
               scale_x_continuous(limits = c(200,95000))+
               scale_y_continuous(limits = c(0,0.9))+
               labs( title = 'Housing Finance Commitment in Australia (Y_to_Y
Growth % : Point Size)<br>Source:<a
href="http://www.abs.gov.au/ausstats/abs@.nsf/0/05DBCE56402EC566CA25723D000F2999
?Opendocument">Housing data</a>',
                     y =  "Proportion of Finance for Selected Purpose",
                     x = "Total Finance Commitment ($'000,000)")+
               theme(axis.title = element_text(lineheight=1,size=9,
                                               face="bold",colour = "gray40"))+
               scale_fill_brewer(palette = "Dark2")




    )
```

```
  })

  #line plot 1
  output$line <- renderPlotly({
    plot_ly(housing4) %>%
      group_by(Purpose) %>%
      add_trace(x=~Year, y=~total, group=~Purpose, color=~Purpose,
                mode="lines",colors = "Set1") %>%

      layout( yaxis = list(zeroline = FALSE, title = "Proportion of Finance
Commitment"),
              xaxis = list(zeroline = FALSE, title = "Year"))%>%
      add_segments(x=input$Year, xend=input$Year,
                   y=0, yend=1,
                   line = list(dash = "dot"),
                   color=I("BLACK"),
                   size=I(1),
                   showlegend=F,
                   name=" ",
                   hoverinfo = "text",
                   text=paste(input$Year))




  })

  #line plot 2
  output$line2 <- renderPlotly({
    plot_ly(data = filter(housing5,Purpose==input$Purpose,State==input$State))
%>%
      group_by(State) %>%
      add_trace(x=~Year, y=~Growth, group=~State, color=~State,
                mode="lines",colors = "Dark2") %>%


      layout( title = paste(input$Purpose,"(1993-2017)"),
              titlefont=list(size=15),
              yaxis = list(zeroline = TRUE,
                           title = "Growth % (Year_to_Year)",
                           range=c(-50,200)),
              xaxis = list(zeroline = FALSE, title = "Year",range=c(1993,2017)),
              showlegend=T)%>%
      add_segments(x=input$Year, xend=input$Year,
                   y=-50, yend=175,
                   line = list(dash = "dot"),
                   color=I("BLACK"),
                   size=I(1),
                   showlegend=F,
                   name=" ",
                   hoverinfo = "text",
                   text=paste(input$Year,input$State))




  })
```

```
}

# Create ui

ui5 <- fluidPage(
  titlePanel("Australian Owner Occupation Housing Finance and Australian
Economy"),
  sidebarLayout(
    sidebarPanel(
      h3("Select the loan purpose"),
      selectInput("Purpose",  label = "Purpose",
                  choices =  c(levels(housing3$Purpose)),
                  selected = "Refinancing of established dwellings"),
      helpText("Select Loan purpose to visualize the evolution"),

      h3("Select the year"),
      sliderInput("Year", label = "Year",
                  min = 1993, sep="", step = 1,
                  max = 2017, value = 1993,
                  animate = animationOptions(interval = 500, loop = FALSE)
                  ),
      helpText("Select year to see the statistics. Play to start the animation")
,
    br(),
    br(),
    br(),


    h3("Select the state"),
    selectInput("State",  label = "State",
                choices =  c(levels(housing5$State)),
                selected = "NSW",
                multiple = FALSE),
    helpText("Select State to see the growth of each finance purpose"),

    br(),
    br(),


    h3("About the App"),
    helpText("The owner occupation housing finance commitments in Australia is
ever growing in  alarming rate. There is a very high rate of loan refinancing as
well.  With these very high rates of finance commitments, Australians are at a
risk of becoming 'mortgage prisoners'. This tool is intended to analyze the
evolution and growth of owner occupation finance commitment under three main
loan types that are notioned as 'Purpose'. Select the 'Purpose' from the drop-
down list and click the 'Play' button to see the evolution of the Propotion of
each loan purpose for different states. Also, the Year-to-Year growth of
selected loan purpose can be visualized under 'Growth of Housing Financing
Commitment by Purpose' tab for selected state"),
    helpText(a("See the full article",
               href="https://www.news.com.au/finance/money/costs/the-
australians-at-risk-of-becoming-mortgage-prisoners/news-
story/f8f3bd92868dab66280bd23c6315868c"))) ,
```

```
    mainPanel(
      h3(textOutput("selected_year")),
      p(textOutput("selected_purpose")),

      plotlyOutput("scatter"),
              tabsetPanel(type="tabs",
                          tabPanel("Proportions of the Loan Purpose",
                                   plotlyOutput("line")),
                          tabPanel("Growth of Housing Financing Commitment by
Purpose",
                          plotlyOutput("line2"))
                          )
              )
))

# Deploy app

shinyApp(ui = ui5, server = server5)
```