R-plotly-mini-course

Outline

- Basic Review on R environment
- How to connect R with plotly platform
- Data Visualization on plotly
- It's Your turn!!
- Give us some feedback

1. Basic Review on R environment

- Please open another file Introduction-to-R-Environment.Rmd

Clear the environment

```
rm(list=ls())
```

2.How to connect R with plotly platform

2.1 Import Data

```
data.vis.1.sa<-read.csv("./_data/data.vis.1.sa.csv")
```

`./` represents the current working directory, normally where your .Rproj file is.
`./_data/` represents the subdirectory under './'.

```
data.vis.1.sa
head(data.vis.1.sa)
```

look at the class of each variable

2.2 Convert to Date class

```
data.vis.1.sa$date <- as.Date(data.vis.1.sa$date)
data.vis.1.sa
```

Data type is an important issue in R, but it is not the main topic of this class.

```
head(data.vis.1.sa)
```

look at the class of `class` variable

2.3 Introduction to plotly

```
install.packages("plotly")
```

Load plotly package

```
library(plotly)
```

Initiate a plotly plot

```
data.vis.1.sa

library(magrittr)
data.vis.1.sa %>% plot_ly(x=~date) %>%
  add_lines(y=~GDP,
            name="GDP") -> p0
p0
```

Without pipe, the code may be :

add_lines(plot_ly(data.vis.1.sa, x=~date, y=~GDP), name="GDP")->p0

```
p0 %>% add_lines(y=~C,
          name="Consumption") -> p0
p0
```

```
data.vis.1.sa %>% plot_ly(x=~date) %>%
  add_lines(y=~GDP,
            name="GDP") %>%
  add_lines(y=~C,
            name="Consumption") -> p0
p0
```

```
data.vis.1.sa %>% plot_ly(x=~date) %>%
  add_lines(y=~GDP,
            name="GDP") %>%
  add_lines(y=~C,
            name="Consumption") %>%
  add_lines(y=~G,
            name="Gov't Purchase") %>%
  add_lines(y=~I,
            name="Investment") %>%
  add_lines(y=~Ex,
            name="Export") %>%
  add_lines(y=~Im,
            name="Import")-> p0
p0
```

2.4 Upload to plotly and modify in Plot.ly platform

Find your authentication API keys in your online settings and them in the function below.

```
Sys.setenv("plotly_username"="your username on plotly")
Sys.setenv("plotly_api_key"="the API key string on plotly")
```

```
Sys.setenv("plotly_username"="your username on plotly")
Sys.setenv("plotly_api_key"="the API key string on plotly")
api_create(p0,filename="taiwan real gdp SA",fileopt="overwrite")
```

3. Data Visualization on plotly

In Plot.ly, you can
- adjust your graph by clicking `Edit`
- download graph code by clicking `View` and choose `R`

3.1 Basic data visualization rule

Make sure you include the following components:

- Proper title
- meaningful subtitle
- Data source
- Layout should follow the Z-rule

3.2 Plot.ly trick

You can download your designed layout from plot.ly to use in your program.

```
p0 %>% layout(

  Copy and paste the code chunck XXX from the part inside list()
of layout<-list(XXX)

)
```

```
p0 %>% layout(
  annotations = list(
    list(
      x = "2017-01-01 08:00:00.13650",
      y = 4147012.08557,
      font = list(
        color = "rgb(31, 119, 180)",
        size = 14
      ),
      showarrow = FALSE,
      text = "GDP",
      xref = "x",
      yref = "y"
    ),
    list(
      x = "2017-01-01",
      y = 1900000,
      font = list(
        color = "rgb(255, 127, 14)",
        size = 15
      ),
      showarrow = FALSE,
      text = "Consumption",
      xref = "x",
      yref = "y"
    ),
    list(
      x = "2017-01-01 08:00:00.13560",
      y = 3205000,
      font = list(
        color = "rgb(148, 103, 189)",
        size = 15
      ),
      showarrow = FALSE,
```

```
    text = "Export",
    xref = "x",
    yref = "y"
  ),
  list(
    x = "2017-01-01 08:00:00.13610",
    y = 2510000,
    font = list(
      color = "rgb(140, 86, 75)",
      size = 15
    ),
    showarrow = FALSE,
    text = "Import",
    xref = "x",
    yref = "y"
  ),
  list(
    x = "2017-01-01",
    y = 1200000,
    font = list(
      color = "rgb(214, 39, 40)",
      size = 15
    ),
    showarrow = FALSE,
    text = "Investment",
    xref = "x",
    yref = "y"
  ),
  list(
    x = "2017-01-01 08:00:00.1353",
    y = 400000,
    font = list(
      color = "rgb(44, 160, 44)",
      size = 15
    ),
    showarrow = FALSE,
    text = "Gov Purchase",
    xref = "x",
    yref = "y"
  ),
  list(
    x = 0.5,
    y = 1.15,
    showarrow = FALSE,
    text = "Chained-dallor year = 2011, in NTD million, Seasonally Adjusted",
    xref = "paper",
    yref = "paper"
  ),
  list(
    x = 0,
    y = -0.20,
    showarrow = FALSE,
    text = "Source: <a href=\"data.gov.tw\">Taiwan Open Data</a>",
```

```
      xanchor = "left",
      xref = "paper",
      yref = "paper"
    )
  ),
  dragmode = "zoom",
  hovermode = "closest",
  margin = list(
    r = 80,
    t = 55,
    b = 90,
    l = 60
  ),
  showlegend = FALSE,
  title = "Taiwan Real GDP and its Components",
  xaxis = list(
    autorange = TRUE,
    categoryarraysrc = "tpemartin:82:10f067",
    categoryorder = "array",
    domain = c(0, 1),
    nticks = 9,
    range = c("1982-01-01", "2018-11-22 15:10:14.3975"),
    showgrid = FALSE,
    showline = FALSE,
    showspikes = FALSE,
    tickmode = "auto",
    title = "<br>",
    type = "date",
    zerolinewidth = 1
  ),
  yaxis = list(
    autorange = TRUE,
    domain = c(0, 1),
    range = c(-59416.6666667, 4251896.66667),
    showgrid = TRUE,
    showspikes = FALSE,
    side = "right",
    title = "<br>",
    type = "linear"
  )

) -> p1

p1
```

4. It's Your turn!!

- Please Open the homework.Rmd in this project

5. Give us some feedback

- Please open the questionnaire and further materials.Rmd