Part C: Visualizing COVID-19

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Generic Plot() Function

- Basic function in R
- 2D format
- Correlation
- Scatter plots and line graphs

The generic syntax for the Plot function is:

Plot(x,y. . .)

Advanced Plot() Function

Advanced Plot function syntax is:

plot(x, y, type, main, sub, xlab, ylab)

where. . .

"**p**": points
"**l**": lines
"**b**": both point and lines in a single place
"**c**": join empty point by the lines
"**o**": both lines and over-plotted point
"**h**": histogram "**s**": stair steps
"**n**": no plotting

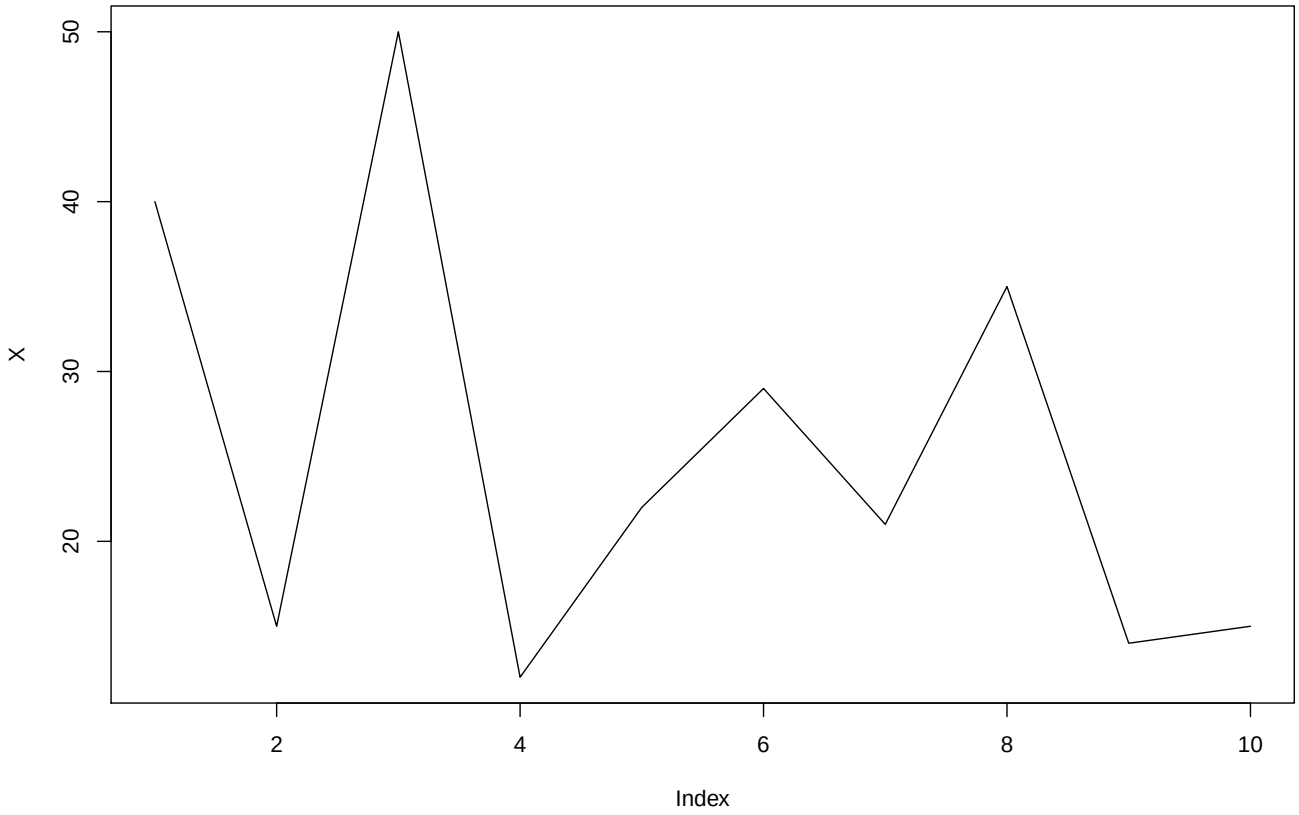
"**xlab**": x-axis legends
"**ylab**": y-axis legends

Example Exercise

Exam grades of 10 students in two courses, X and Y, respectively
X = 40, 15, 50, 12, 22, 29, 21, 35, 14, 15
Y = 41, 42, 32, 14, 42, 27, 13, 50, 33, 22

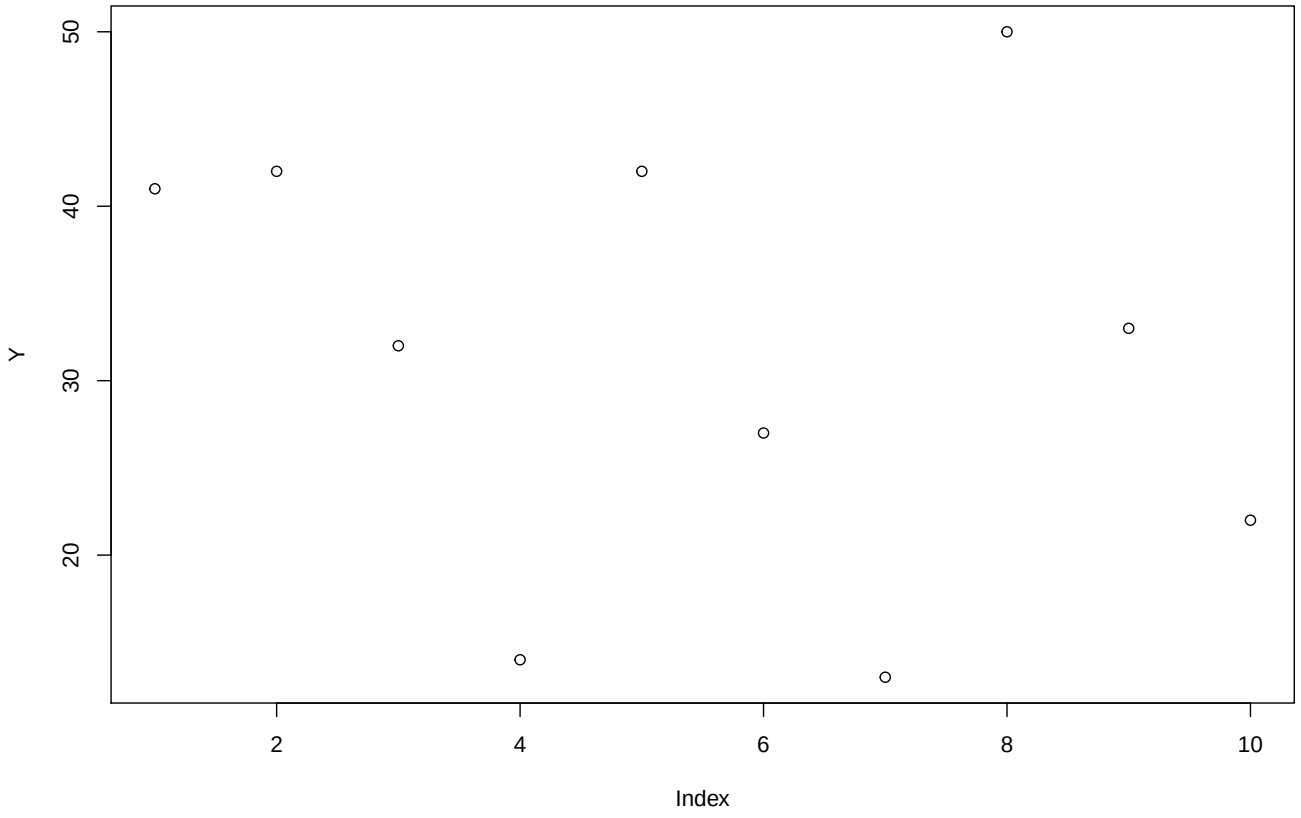
Exercise 1: Define X and plot as lines plot

```
X = c(40, 15, 50, 12, 22, 29, 21, 35, 14, 15)
plot(X ,type = "l")
```

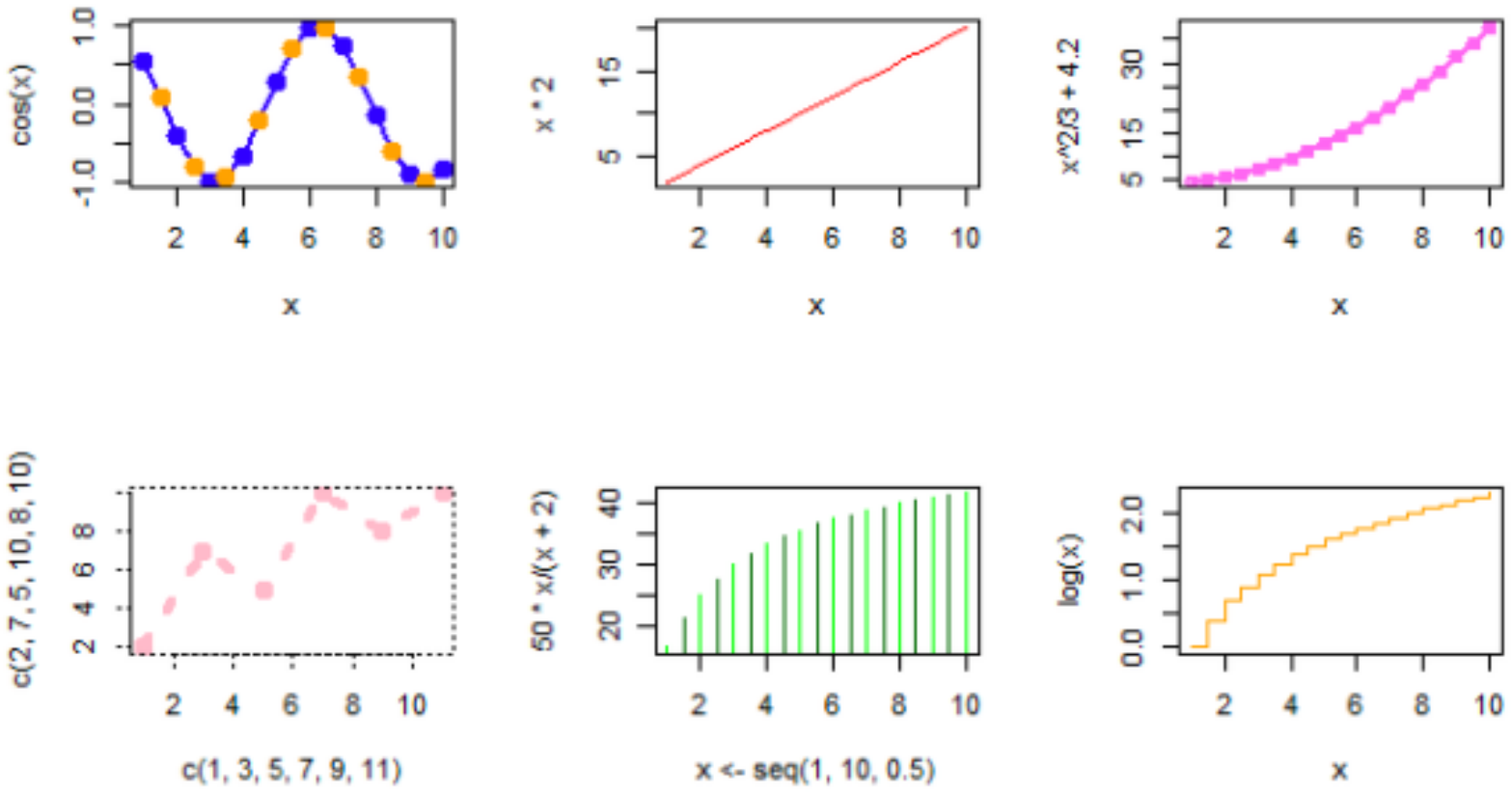


Exercise 2: Define Y and plot as points plot

```
Y = c(41, 42, 32, 14, 42, 27, 13, 50, 33, 22)
plot(Y ,type = "p")
```



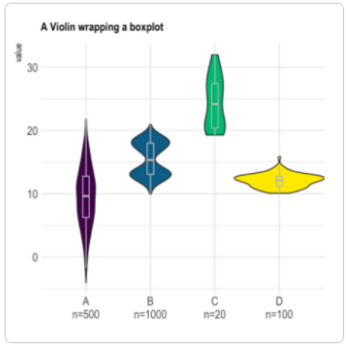
Plot() Function Capabilities

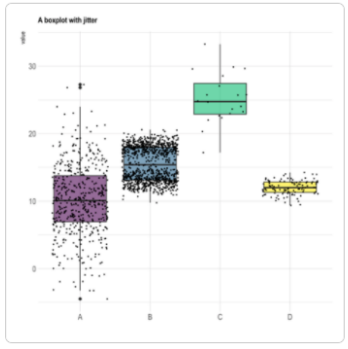


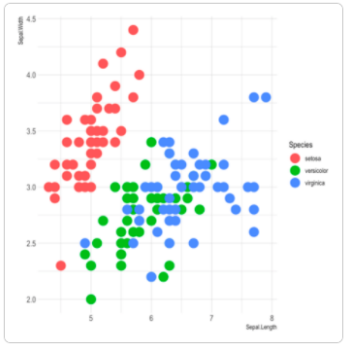
ggplots() package

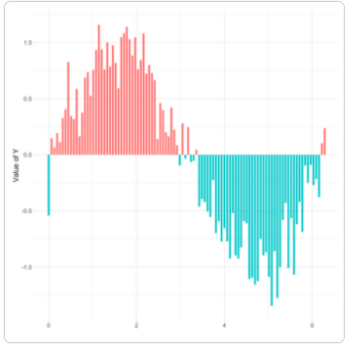
```
# The easiest way to get ggplot2 is to install the whole ti
install.packages("tidyverse")

# Alternatively, install just ggplot2:
install.packages("ggplot2")

# Or the development version from GitHub:
# install.packages("devtools")
devtools::install_github("tidyverse/ggplot2")
```

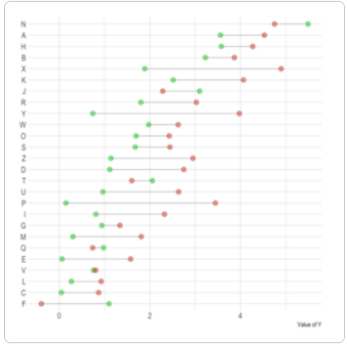
ggplot() capabilities

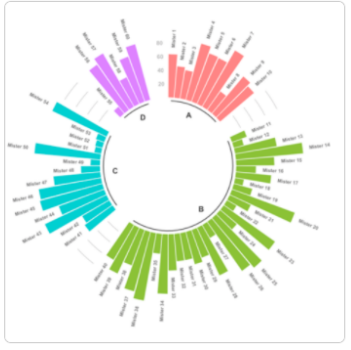


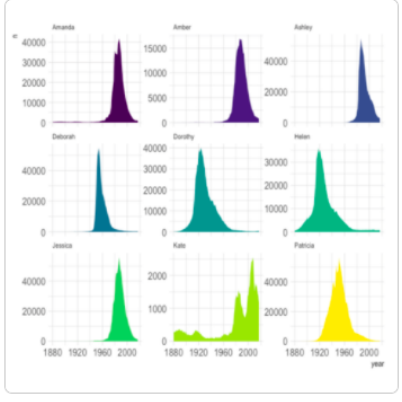


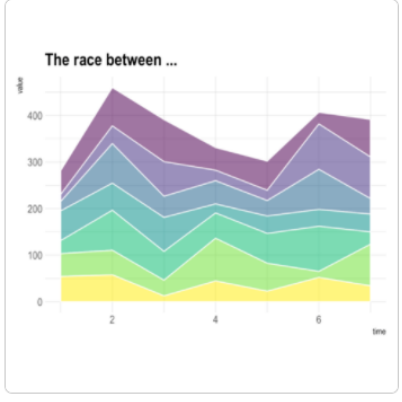












Case Study

Package: nCov2019
By: Dr. Guangchuang Yu (Southern Medical University)
Install and load package

```
remotes::install_github("GuangchuangYu/nCov2019")

library(nCov2019)
get_nCov2019()
load_nCov2019()
```

1st Impression of dataset

Assign x and y

```
x <- get_nCov2019()
y <- load_nCov2019()
```

Check results for x and y

```
x
```

```
China (total confirmed cases): 95901
last update: 2020-12-21 20:45:32
```

```
y
```

```
nCov2019 historical data
last update: 2020-11-26
```

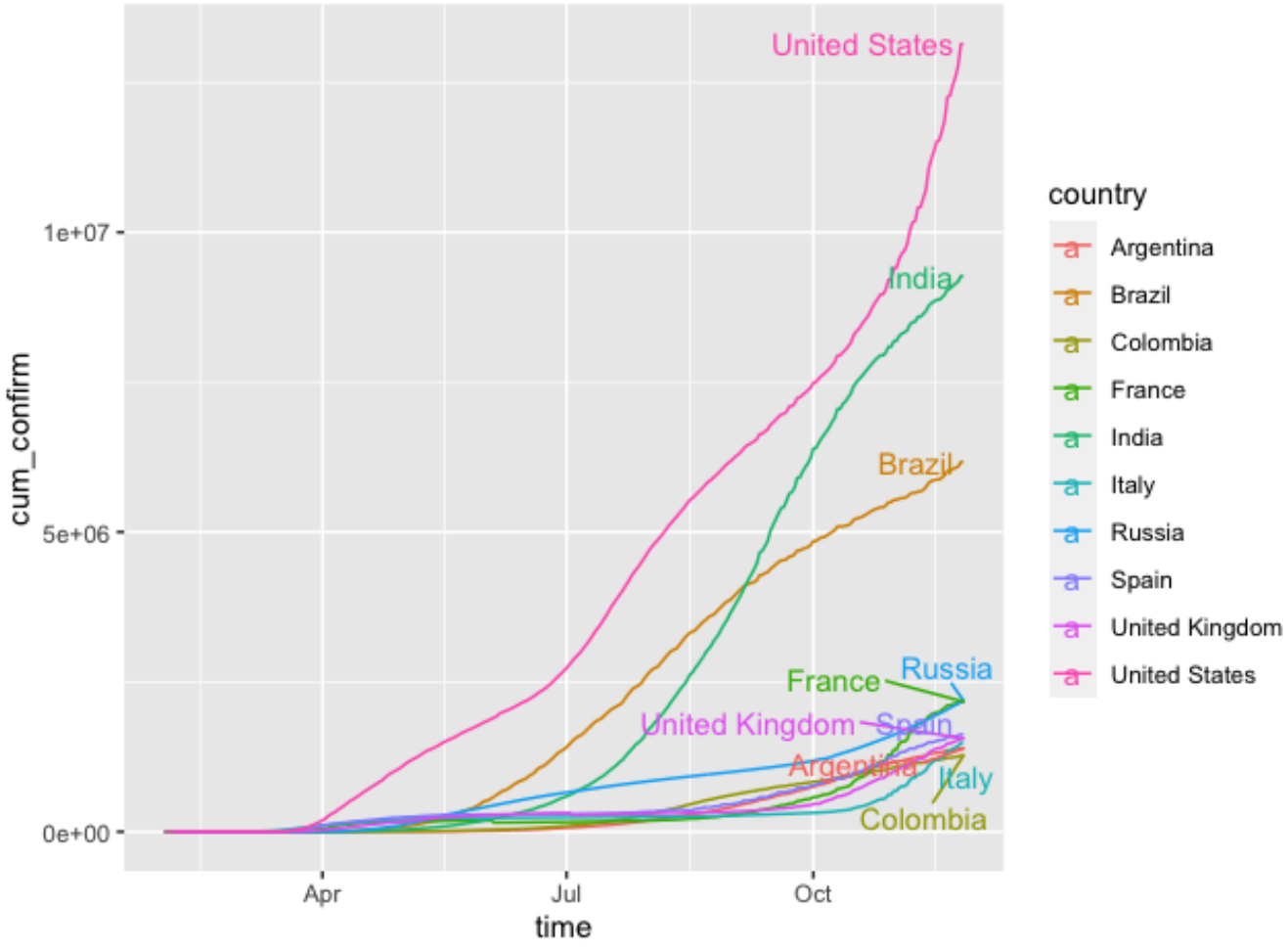
Impression of worldwide data

```
x['global']
```

	name	confirm	suspect	dead	deadRate	show
1	China	95901	7	4771	4.97	FALS
2	United States	18277433	0	324898	1.78	FALS
3	India	10055560	0	145810	1.45	FALS
4	Brazil	7238600	0	186764	2.58	FALS
5	Russia	2850042	0	50723	1.78	FALS
6	France	2529756	0	60665	2.4	FALS
7	United Kingdom	2079564	0	67718	3.26	FALS
8	Turkey	2043704	0	18351	0.9	FALS
9	Italy	1964054	0	69214	3.52	FALS
10	Spain	1817448	0	48926	2.69	FALS
11	Argentina	1541285	0	41813	2.71	FALS
12	Germany	1531998	0	26655	1.74	FALS

Visualize with line graph using ggplot

Using ggplot2, we can see the growth of confirmed cases



Visualize a static map with plot()

Package: maps

```
install.packages("maps")

require(nCov2019)
require(dplyr)
x <- get_nCov2019()
```

Visualize a static map with plot()

```
# we assigned x <- get_nCov2019(), so now we plot them
plot(x)
```