learnr: Interactive R tutorials

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Assume you teach R to others...
Beginner’s feeling

tip-toeing into R...

Help...
learnr:

- Execute R code in excise chunk without pre-installing
- Document learning progress
- Customize quiz or code exercise
- Insert narratives, video or pictures
English Translation of Chinese words: Give a Man a Fish, and You Feed Him for a Day. Teach a Man To Fish, and You Feed Him for a Lifetime.

About

The PlayeR website teaches you how to programming in R and Statistics interactively with practicing in the R console. No need to download anything.

There are three main part of each chapter: demo code and play by yourself.

- **Demo code**: code will be in R chunk followed with the plot and result.
- **Play R by yourself**: default as demo code. It will be your turn to twist the code and see what happen. Have fun!
- **Quiz**: a quiz!

Source: [https://appforiarteam.shinyapps.io/PlayR/#section-about](https://appforiarteam.shinyapps.io/PlayR/#section-about)
Data Visualization: Static

One of the most important parts of data analysis is to visualize your data even before any modeling or manipulation because you can see a lot by looking. This chapter will introduce one of the most powerful R package `ggplot`, and you can customize and polish your plots to generate graphics for scientific paper. You can play the code in the Exercise with Code session.

Note: this chapter will use `iris` dataset (a default R dataset), no need to load external data.

Box Plot

Demo part:

This is a demo for generating boxplot using `iris` dataset:

```r
### Iris as a default demo dataset
### fill= Species means each Species has its own color
ggplot(iris, aes(x = Species, y = Petal.Length, fill = Species)) +
  ### geom_boxplot() means plotting as boxplot
  geom_boxplot() +
  ### xlab() for X label
  xlab("Species")
  ### ylab() for Y label
  ylab("Sepal Length (cm)")+
  ### theme_classic() change the background and ggplo theme.
  theme_classic() +
  ### change the x and y coordinator labels size
  theme(axis.text=element_text(size=12,face="bold"),axis.title=element_text(size=14,face="bold"))
```
Default as demo code. It will be your turn to twist the code and see what happen. Have fun!

Now your turn, twist the demo code and see how it changes:

```r
## Iris as a default demo dataset
ggplot(iris, aes(x = Species, y = Petal.Length, fill = Species)) +
  geom_boxplot() +
  geom_boxplot() +
  xlab("Species") +
  ylab("Sepal Length (cm)") +
  theme_classic() +
  theme(axis.text.element_text(size=12,face="bold"), axis.title.element_text(size=14, face="bold"))
```

Output from Exercise Chunk

![Boxplot of Sepal Length for different species](image)
Educators:

Use *learnr*:

- Students can play (interact) with the code and have a broad idea of the concept (preview)
- Time saved to hands on experience in a class (classroom)
- Follow up exercise (review)
Students or self-learner:

Use `learnr`:

- Learning by doing (R exercise chunks)
- Document the learning process
- Systemically tutorials
Extra Packages:

- Code Checking
- `checkr` by Danny Kaplan: github.com/dtkaplan/checkr
- `grader` by Garrett Grolemund: github.com/rstudioeducation/grader
Thanks!

Any (easy) questions?