Institute of Systems Science

National University of Singapore

GRADUATE CERTIFICATE

BUSINESS ANALYTICS PRACTICE

Supplementary Workshop Guide
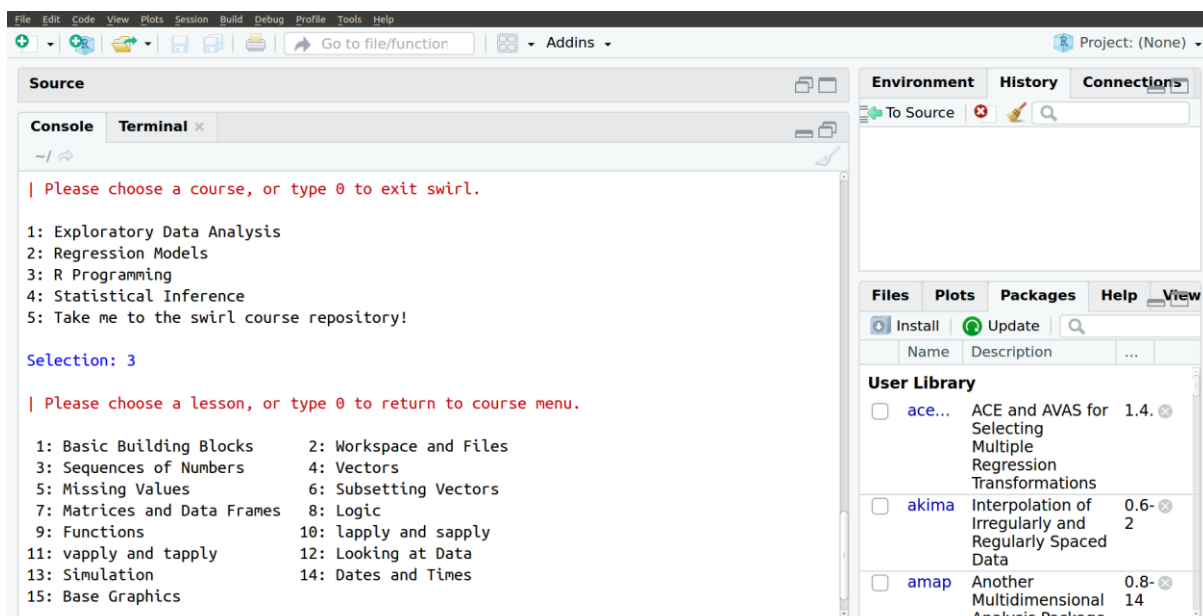
Subject: *NICF- Statistics Bootcamp (SF)*

Interactive R Workshops

Home   Learn   Teach   Contribute   Blog   FAQ   Help

{ swirl }

Learn R, in R.

swirl teaches you R programming and data science
interactively, at your own pace, and right in the R
console!

https://swirlstats.com/

R Studio® Integrated Development Environment (IDE)

NUS National University of Singapore | ISS INSTITUTE OF SYSTEMS SCIENCE

Step 1 – Install swirl package into R/RStudio:

```
install.packages("swirl")
```

Step 2 - Activate swirl package in R/RStudio:

```
library(swirl)
```

Step 3 - Install interactive workshops:

```
install_course("R Programming")
install_course("Exploratory Data Analysis")
install_course("Regression Models")
install_course("Statistical Inference")
```

Step 4 - Start interactive workshops:

```
swirl()
```

```
# "R Programming"
# "Exploratory Data Analysis"
# "Statistical Inference"
# "Regression Models"
```

Video Guides https://github.com/telescopeuser/S-SB-Workshop

[Fundamental] R Programming

```
=============================================================
 1: Basic Building Blocks          [SB Data Processing]
 2: Workspace and Files            [SB Data Processing]
 3: Sequences of Numbers           [SB Data Processing]
 4: Vectors                        [SB Data Processing]
 5: Missing Values                 [SB Data Processing]
 6: Subsetting Vectors             [SB Data Processing]
 7: Matrices and Data Frames       [SB Data Processing]
 8: Logic                          [SB Exercise]
 9: Functions                      [Optional]
10: lapply and sapply              [SB Exercise]
11: vapply and tapply              [Optional]
12: Looking at Data                [SB Data Processing]
13: Simulation                     [SB Sample&Norm]
14: Dates and Times                [Optional]
15: Base Graphics                  [SB Charting]
=============================================================
```

[Fundamental] Exploratory Data Analysis

```
============================================================
 1: Principles of Analytic Graphs                   [Optional]
 2: Exploratory Graphs                          [SB Exercise]
 3: Graphics Devices in R [PDF PNG SVG]             [Optional]
 4: Plotting Systems                            [SB Charting]
 5: Base Plotting System                        [SB Exercise]
 6: Lattice Plotting System                         [Optional]
 7: Working with Colors                             [Optional]
 8: GGPlot2 Part1  [qplot]                      [SB Charting]
 9: GGPlot2 Part2  [ggplot]                     [SB Charting]
10: GGPlot2 Extras [qplot]                          [Optional]
11: Hierarchical Clustering [Machine Learning]      [Optional]
12: K Means Clustering      [Machine Learning]      [Optional]
13: Dimension Reduction     [Machine Learning]      [Optional]
14: Clustering Example      [Machine Learning]      [Optional]
15: CaseStudy [pm2.5 air pollution]                 [Optional]
============================================================
```

[Intermediate] Regression Models

```
===============================================================
 1: Introduction [regression to mean]              [Optional]
 2: Residuals [var(data)=var(estmt)+var(resdls)]   [Optional]
 3: Least Squares Estimation                       [Optional]
 4: Residual Variation [R^2=1-sRes/sTot=cor()^2]   [Optional]
 5: Introduction to Multivariable Regression       [Optional]
 6: MultiVar Examples                              [Optional]
 7: MultiVar Examples2                             [Optional]
 8: MultiVar Examples3 [MultipleLinearRegression]  [Optional]
 9: Residuals Diagnostics and Variation            [Optional]
10: Variance Inflation Factors [VIF]               [Optional]
11: Overfitting and Underfitting [ANOVA, F-test]   [Optional]
12: Binary Outcomes                                [Optional]
13: Count Outcomes                                 [Optional]
===============================================================
```

[Advanced] Statistical Inference

```
============================================================
 1:  Introduction                             [SB Exercise]
 2:  Probability1 [dice, playing cards)        [Optional]
 3:  Probability2 [PMF PDF CDF]                [Optional]
 4:  ConditionalProbability [medic test]       [Optional]
 5:  Expectations [E(X), CLT]                  [SB Sample&Norm]
 6:  Variance [Var = E(X^2)-(E(X))^2]          [Optional]
 7:  CommonDistros [Bernoulli Normal Poisson]  [Optional]
 8:  Asymptotics [central limit theorem, CI]   [Optional]
 9:  T Confidence Intervals [nitty-gritty]     [Optional]
10:  Hypothesis Testing [t-test, z score]      [SB Exercise]
11:  P Values [nitty-gritty]                   [SB Exercise]
12:  Power [false negative, Type II error]     [Optional]
13:  Multiple Testing [confusion matrix]       [Optional]
14:  Resampling [bootstrap]                    [Optional]
============================================================
```

More Interactive Workshops

```
# Follow below for: Step 3 - Install interactive workshops:
# Download ZIP  Download ZIP  file; save it to R working directory
# https://github.com/telescopeuser/S-SB-Workshop
```

telescopeuser / **S-SB-Workshop**   👁 Unwatch ▾ 1   ★ Star 0   ⑂ Fork 0

ⓘ 3 commits	⑂ 1 branch	◌ 0 releases	👥 1 contributor	⚖ GPL-3.0

Branch: master ▾   New pull request   Create new file   Upload files   Find file   **Clone or download ▾**

Gu Zhan initial

Clone with HTTPS ⑦   Use SSH

Use Git or checkout with SVN using the web URL.

`https://github.com/telescopeuser/S-SB-Wo`   📋

📁 Exploratory_Data_Analysis		
📁 Getting_and_Cleaning_Data		
📁 Mathematical_Biostatistics_Boot_Camp		
📁 Open_Intro/Overview_of_Statistics		
	Open in Desktop	**Download ZIP**
📁 R_Programming	initial	an hour ago
📁 Regression_Models	initial	an hour ago
📁 Statistical_Inference	initial	an hour ago
📄 .gitignore	initial	an hour ago
📄 LICENSE	initial	an hour ago
📄 README.md	initial	an hour ago

```
install_course_zip("S-SB-Workshop-master.zip", multi=TRUE)
```

```
# Step 4 - Start interactive workshops:
```

```
swirl()
```

```
[Intermediate] Open Intro
=================================================================
 1: Overview of Statistics                          [Optional]
=================================================================


[Intermediate] Mathematical Biostatistics Boot Camp
=================================================================
 1: One Sample t-test [nitty-gritty]                [Optional]
 2: Two Sample t-test [nitty-gritty]                [Optional]
 3: Errors Power and Sample Size                    [Optional]
=================================================================


[Advanced] Getting and Cleaning Data
=================================================================
 1: Manipulating Data with dplyr                    [Optional]
 2: Grouping and Chaining with dplyr                [Optional]
 3: Tidying Data with tidyr                         [Optional]
 4: Dates and Times with lubridate                  [Optional]
=================================================================
```