Institute of Systems Science

National University of Singapore

GRADUATE CERTIFICATE

BUSINESS ANALYTICS PRACTICE

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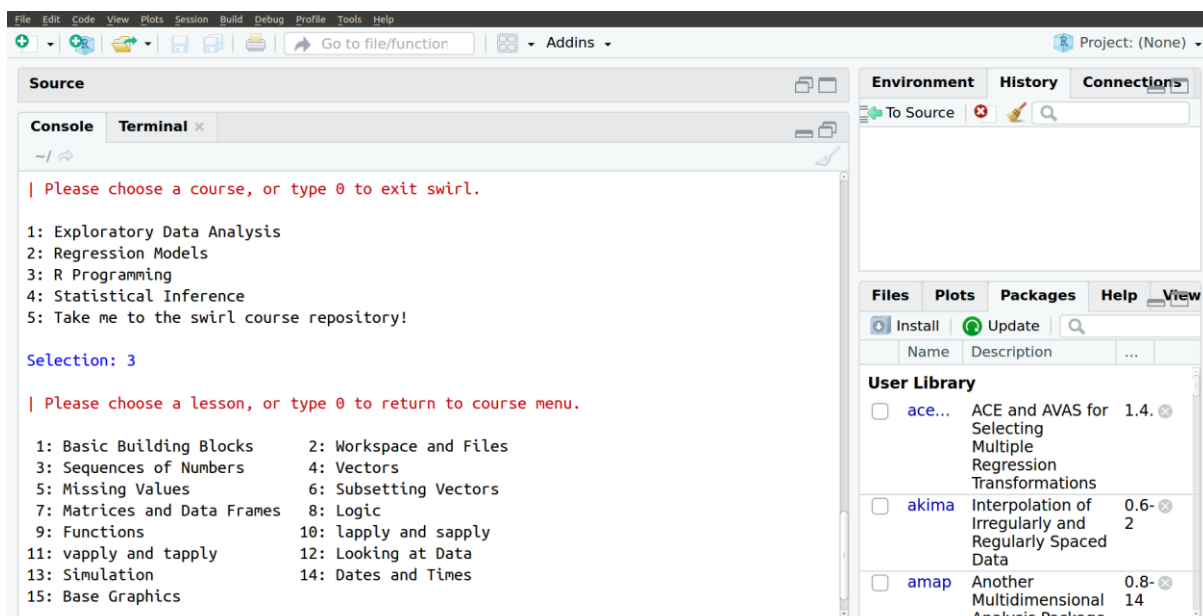
Subject: *NICF- Statistics Bootcamp (SF)*

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/

```
| Please choose a course, or type 0 to exit swirl.

1: Exploratory Data Analysis
2: Regression Models
3: R Programming
4: Statistical Inference
5: Take me to the swirl course repository!

Selection: 3

| Please choose a lesson, or type 0 to return to course menu.

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

R Studio Integrated Development Environment (IDE)

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

[Fundamental] Exploratory Data Analysis

```
============================================================
 1: Principles of Analytic Graphs                   [Optional]
 2: Exploratory Graphs                              [Exercise]
 3: Graphics Devices in R [PDF PNG SVG]             [Optional]
 4: Plotting Systems                                [Charting]
 5: Base Plotting System                            [Exercise]
 6: Lattice Plotting System                         [Optional]
 7: Working with Colors                             [Optional]
 8: GGPlot2 Part1   [qplot]                         [Charting]
 9: GGPlot2 Part2   [ggplot]                        [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                              [Exercise]
 2:  Probability1 [dice, playing cards)        [Optional]
 3:  Probability2 [PMF PDF CDF]                 [Optional]
 4:  ConditionalProbability [medic test]        [Optional]
 5:  Expectations [E(X), CLT]                   [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]       [Exercise]
11:  P Values [nitty-gritty]                    [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		
📁 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

Open in Desktop   **Download ZIP**

```
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]
==================================================================
```

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