### M11 - Introduction

LearningSpoonsR

2019-01-25

강의 소개

설치 및 준비

논의

수업 과정

M11 - Introduction 나 강의 소개

강의 소개

# 강의 소개

### 강사 소개

- ▶ 심민규 (공학박사)
  - ▶ 현재
    - ▶ 경희대학교 연구교수
    - ▶ FinTech 스타트업 자문
    - ▶ 러닝스푼즈등 강의
  - ▶ 경력
    - ▶ 항공사, Operation 수요 분석
    - ▶ 자산운용사, 시장 분석 및 펀드 운용
    - ▶ FinTech 스타트업, 모형 개발

### 강의 일정 및 소통

- 1/28(월), 2/11(월), 2/18(월), 2/25(월), 3/4(월)
- ▶ 2/4(월) 휴강
- ▶ facebook에서 "Minkyu Sim" 검색 후 친구 신청 → 페이스북 그룹에 넣어드림
- ▶ 강의 자료 페이지 https://github.com/LearningSpoonsR/LS-DS
- ▶ learingSpoonsR@gmail.com(강사이메일)
- ▶ 김형종 매니저

### 프로젝트 소개

### 수강생 프로젝트 소개

▶ http://bitly.kr/1G0Q

### M41으로 보는 강의 목표

- ▶ 상관관계 (correlation) vs 인과관계 (causation)
- 1. income -> 기대수명
- 2. 부모수명 -> 자녀수명
- 3. 쌍둥이 형 -> 쌍둥이 동생

$$Y = \beta_0 + \beta_1 X + \epsilon$$

- 1. y = ax + b
- $2. \beta_1$
- 3.  $\beta_0$
- 4. *ϵ*

# 설치 및 준비

# R 설치

### 설치 전 할일

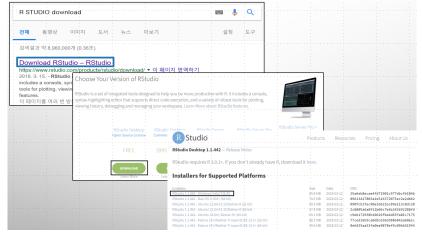
- ▶ 윈도우 사용자 계정을 영어로 바꿔주세요.
  - ▶ 제어판 → 사용자 계정 → 계정 이름 변경 → 영어로 입력
  - ▶ 앞으로도 R파일과 데이터 파일 등도 가급적이면 영어로 다루는게 편리합니다.

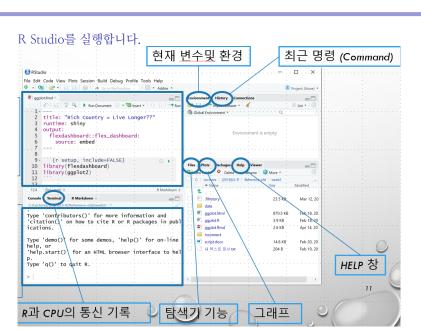
# google에서 "R download"를 검색하고 다운받아 설치합니다.



# R Studio 설치

# google에서 "R Studio download"를 검색하고 다운받아 설치합니다.





### 1. 좌상 패널 (Editor)

- ▶ 메모장과 같은 기능을 제공합니다. (편집 및 저장)
- ▶ Ctrl + Enter
  - 커서가 있는 라인
  - ▶ 선택된 블럭이 있을 경우 그것을 실행합니다.
- ▶ Ctrl + 1
  - ▶ 다른 패널에서 Editor 패널로 이동합니다.
- ▶ Ctrl + Shift + 1
  - ▶ Editor 패널을 전체화면으로 표시합니다.

### 2. 좌하 패널 (Console)

- ▶ DOS창 처럼 R의 명령어를 실행할 수 있습니다.
- ▶ Ctrl + 2
  - ▶ 다른 패널에서 Console 패널로 이동합니다.
- ▶ Ctrl + Shift + 2
  - ▶ Console 패널을 전체화면으로 표시합니다.
- ▶ Terminal 탭은 R와 CPU의 통신 기록을 보여줍니다.
- 3. 우상 패널
  - ▶ 현재 메모리 상태등을 보여줍니다.
- 4. 우하 패널
  - ▶ 파일 탐색기, 출력된 그래프, HELP등의 기능을 제공합니다.

### 아래 코드를 콘솔에 입력해보세요.

```
"Hello"
a <- 10
b <- a + 5
install.packages("dplyr")
library(dplyr)
b</pre>
```

▶ 에러가 없이 수행되고 아래의 결과가 나오시나요?

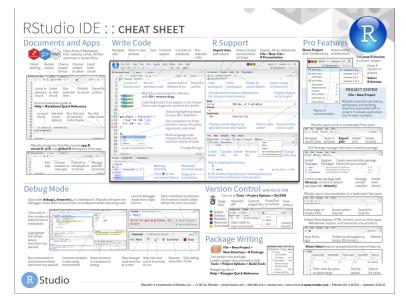
#### ## [1] 15

- ▶ 우상단 패널에서 "History" 탭을 누르면 지금까지 실행한 명령을 볼 수 있습니다.
- ▶ 이들을 카피해서 좌상단 Editor 패널에 입력하세요.
- ▶ File → Save As를 이용해서 first.R로 저장하세요.
- ▶ Rstudio를 종료하고 윈도우 탐색기에서 first.R을 찾아 더블클릭하세요.

### 여러가지 설정을 할 수 있습니다.

- 1. Tool → Global Option →
  - ▶ Appearance: 폰트와 색상 등을 조정
  - ▶ PANE Layout: 모니터 크기와 작업 목적에 따라 조정
  - ▶ CODE -> Saving -> Text Encoding in -> UTF-8: 한글이 깨지는 현상을 방지합니다.
- 2. 한영 전환
  - ▶ 한글로 전환: Sys.Setlocale("LC\_ALL", "ko\_KR.UTF-8")
  - ▶ 영어로 전환: Sys.Setlocale("LC\_ALL", "en\_KR.UTF-8")

# RStudio Cheatsheet (1)



# RStudio Cheatsheet (2)

1 LAYOUT		Windows/Linu	x Mac	4 WRITE CODE	Windows /Linux	Mac	WHY RSTUDIO SERVER PRO?		
Move focus to Source I	Editor	Ctrl+1	Ctrl+1	Attempt completion	Tab or Ctrl+Space	Tab or Cmd+Space	RSP extends the the open source		
Move focus to Console		Ctrl+2	Ctrl+2	Navigate candidates	<b>↑</b> / <b>↓</b>	<b>↑</b> / <b>↓</b>	commercial license, support, and	more:	
		Ctrl+3	Ctrl+3	Accept candidate	Enter, Tab, or ->	Enter, Tab, or ->	<ul> <li>open and run multiple R session</li> </ul>	s at once	HT I
Show History		Ctrl+4	Ctrl+4	Dismiss candidates	Esc	Esc	<ul> <li>tune your resources to improve</li> </ul>	performance	
Show Files		Ctrl+5	Ctrl+5	Undo	Ctrl+Z	Cmd+Z	· edit the same project at the sam		
Show Plots		Ctrl+6	Ctrl+6	Redo	Ctrl+Shift+Z Ctrl+X	Cmd+Shift+Z	see what you and others are doi		
Show Packages		Ctrl+7	Ctrl+7	Cut		Cmd+X	<ul> <li>switch easily from one version of</li> </ul>		erine
Show Environment		Ctrl+8	Ctrl+8	Copy	Ctrl+C Ctrl+V	Cmd+C Cmd+V	integrate with your authentication		
Show Git/SVN		Ctrl+9	Ctrl+9	Paste Select All	Ctrl+A	Cmd+V Cmd+A			id audit practices
Show Build		Ctrl+0	Ctrl+0				Download a free 45 day evaluation		
2 RUN CODE		Windows/Linu	x Mac	Delete Line Soloct	Ctrl+D Shift+(Arrow)	Cmd+D Shift+(Arrow)	www.rstudio.com/products/rst	udio-server-pro	
Search command his	tory	Ctrl++	Cmd+ <b>↑</b>	Select Word	Ctrl+Shift+ 4/+	Option+Shift+ +/+	5 DEBUG CODE	Windows/Lin	ury Mac
Navigate command his		1/4	1/4	Select Word Select to Line Start	Alt+Shift+	Cmd+Shift+		Shift+F9	Shift+F9
Move cursor to start of		Home	Cmd+4	Select to Line Start Select to Line End	Alt+Shift+◆	Cmd+Shift+	Toggle Breakpoint		F10
Move cursor to end of		Fnd	Cmd+	Select to Line End Select Page Up/Down	Shift+PageUp/Down	Shift+PageUp/Down	Execute Next Line Step Into Function	F10 Shift+F4	Shift+F4
Change working direct		Ctrl+Shift+H	Ctrl+Shift+H	Select to Start/End	Shift+Alt+↑/◆	Snint+PageUp/Down Cmd+Shift+♠/◆			
Interrupt current con		Esc	Esc	Delete Word Left	Ctrl+Backspace	Ctrl+Opt+Backspace	Finish Function/Loop	Shift+F6	Shift+F6
Clear console	u	Ctrl+L	Ctrl+L	Delete Word Right	Ctri+Backspace	Option+Delete	Continue	Shift+F5	Shift+F5
Ouit Session (desktop	only	Ctrl+O	Cmd+O	Delete to Line End		Ctrl+K	Stop Debugging	Shift+F8	Shift+F8
Restart R Session	Olity)	Ctrl+Shift+F10		Delete to Line End		Option+Backspace			
Run current line/sele	ction	Ctrl+Enter	Cmd+Enter	Indent	Tab (at start of line)	Tab (at start of line)	6 VERSION CONTROL	Windows/Lin	
Run current (retain cur		Alt+Enter	Option+Enter	Outdont	Shift+Tah	Shift+Tab	Show diff	Ctrl+Alt+D	Ctrl+Option+D
Run from current to en		Ctrl+Alt+E	Cmd+Option+E	Yank line up to cursor	Ctrl+U	Ctrl+U	Commit changes	Ctrl+Alt+M	Ctrl+Option+M
Run the current function	nn n	Ctrl+Alt+E	Cmd+Option+F	Yank line after cursor	Ctrl+K	Ctrl+K	Scroll diff view	Ctrl+ <b>↑/</b> ↓	Ctrl+ <b>↑/</b> ↓
Source a file		Ctrl+Alt+G	Cmd+Option+G	Insert yanked text	Ctrl+Y	Ctrl+Y	Stage/Unstage (Git)	Spacebar	Spacebar
Source the current fil	le	Ctrl+Shift+S	Cmd+Shift+S	Insert <-	Alt+	Option+-	Stage/Unstage and move to next	Enter	Enter
Source with echo		Ctrl+Shift+Enter	Cmd+Shift+Enter						
				Insert %>% Show help for function	Ctrl+Shift+M	Cmd+Shift+M	7 MAKE PACKAGES	Windows/Lin	
3 NAVIGATE CODE		vs/Linux 1	dac				Build and Reload	Ctrl+Shift+B	Cmd+Shift+B
Goto File/Function	Ctrl+.	vs /Linux I	dac Ctrl+.	Show help for function Show source code	F1	F1 F2	Build and Reload Load All (devtools)	Ctrl+Shift+B Ctrl+Shift+L	Cmd+Shift+B Cmd+Shift+L
Goto File/Function Fold Selected	Ctrl+. Alt+L	vs /Linux I	Mac Ctrl+. Cmd+Option+L	Show help for function	F1 F2	Fl	Build and Reload Load All (devtools) Test Package (Desktop)	Ctrl+Shift+B Ctrl+Shift+L Ctrl+Shift+T	Cmd+Shift+B Cmd+Shift+L Cmd+Shift+T
Goto File/Function Fold Selected Unfold Selected	Ctrl+. Alt+L Shift+Alt	vs /Linux I	Mac Ctrl+. Cmd+Option+L Cmd+Shift+Option+L	Show help for function Show source code New document	F1 F2 Ctrl+Shift+N	F1 F2 Cmd+Shift+N	Build and Reload Load All (devtools)	Ctrl+Shift+B Ctrl+Shift+L Ctrl+Shift+T Ctrl+Alt+F7	Cmd+Shift+B Cmd+Shift+L Cmd+Shift+T Cmd+Opt+F7
Goto File/Function Fold Selected Unfold Selected Fold All	Ctrl+. Alt+L Shift+Alt Alt+O	vs/Linux I	Mac Ctrl+. Cmd+Option+L Cmd+Shift+Option+L Cmd+Option+O	Show help for function Show source code New document New document (Chrome)	F1 F2 Ctrl+Shift+N Ctrl+Alt+Shift+N	F1 F2 Cmd+Shift+N Cmd+Shift+Opt+N	Build and Reload Load All (devtools) Test Package (Desktop) Test Package (Web) Check Package	Ctrl+Shift+B Ctrl+Shift+L Ctrl+Shift+T Ctrl+Alt+F7 Ctrl+Shift+E	Cmd+Shift+B Cmd+Shift+L Cmd+Shift+T Cmd+Opt+F7 Cmd+Shift+E
Goto File/Function Fold Selected Unfold Selected Fold All Unfold All	Ctrl+. Alt+L Shift+Alt Alt+O Shift+Alt	vs /Linux	Mac Ctrl+. Cmd+Option+L Cmd+Shift+Option+L Cmd+Shift+Option+O	Show help for function Show source code New document New document (Chrome) Open document	F1 F2 Ctrl+Shift+N Ctrl+Alt+Shift+N Ctrl+O	F1 F2 Cmd+Shift+N Cmd+Shift+Opt+N Cmd+O	Build and Reload Load All (devtools) Test Package (Desktop) Test Package (Web)	Ctrl+Shift+B Ctrl+Shift+L Ctrl+Shift+T Ctrl+Alt+F7	Cmd+Shift+B Cmd+Shift+L Cmd+Shift+T Cmd+Opt+F7
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Goto File/Function Fold Selected Unfold Selected Fold All Unfold All Go to line Jump to	Ctrl+. Alt+L Shift+Alt Alt+O Shift+Alt Shift+Alt Shift+Alt	vs /Linux I	Mac Ctrl+. Cmd+Option+L. Cmd+Shift+Option+U. Cmd+Shift+Option+O Cmd+Shift+Option+O Cmd+Shift+Option+G Cmd+Shift+Option+G	Show help for function Show source code New document New document (Chome) Open document Save document Close document	F1 F2 Ctrl+Shift+N Ctrl+Alt+Shift+N Ctrl+O Ctrl+S Ctrl+W	F1 F2 Cmd+Shift+N Cmd+Shift+Opt+N Cmd+O Cmd+S Cmd+W	Build and Reload Load All (devtools) Test Package (Desktop) Test Package (Web) Check Package Document Package 8 DOCUMENTS AND APPS	Ctrl+Shift+B Ctrl+Shift+L Ctrl+Shift+T Ctrl+Alt+F7 Ctrl+Shift+E Ctrl+Shift+D Windows/Linu	Cmd+Shift+B Cmd+Shift+L Cmd+Shift+T Cmd+Opt+F7 Cmd+Shift+E Cmd+Shift+D X Mac
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Goto File/Function Fold Selected Unfold Selected Fold All Unfold All Go to line Jump to Switch to tab Previous tab	Ctrl+. Alt+L Shift+Alt Alt+O Shift+Alt Shift+Alt Ctrl+Shi Ctrl+F11	vs/Linux	Mac  Ital*.  Imd+Option+L Imd+Option+L Imd+Option+D Imd+Shift+Option+O Imd+Shift+Option+G Imd+Shift+Option+J Ital*Shift+L Ital*Ital*Ital*Ital*Ital*Ital*Ital*Ital*	Show help for function Show source code New document New document Open document Save document Close document Close document Close document Close document (Chrome)	F1 F2 Ctrl+Shift+N Ctrl+Alt+Shift+N Ctrl+O Ctrl+S Ctrl+W Ctrl+Alt+W Ctrl+Alt+W Ctrl+Alt+W	F1 F2 Cmd+Shift+N Cmd+Shift+Opt+N Cmd+O Cmd+S Cmd+W Cmd+Option+W Cmd+Option+W	Build and Reload Load All (devtools) Test Package (Desktop) Test Package (Web) Check Package Document Package 8 DOCUMENTS AND APPS	Ctrl+Shift+B Ctrl+Shift+L Ctrl+Shift+T Ctrl+Alt+F7 Ctrl+Shift+E Ctrl+Shift+D Windows/Linu	Cmd+Shift+B Cmd+Shift+L Cmd+Shift+T Cmd+Opt+F7 Cmd+Shift+E Cmd+Shift+D X Mac
Goto File/Function Fold Selected Unfold Selected Fold All Unfold All Go to line Jump to Switch to tab Previous tab Next tab	Ctrl+. Alt+L Shift+Alt Alt+O Shift+Alt Shift+Alt Shift+Alt Ctrl+Shi Ctrl+F11 Ctrl+F12	vs /Linux	Mac Ztf+. Imd+Option+L. Imd+Shift+Option+L. Imd+Option+O Imd+Shift+Option+O Imd+Shift+Option+J Itrl+Shift+. Itrl+F11 Itrl+F12	Show help for function Show source code New document (New document New document (Chome) Open document Close document Close Close document Close Cl	F1 F2 F2 F2 F3 F4 F4 F5 F6 F7	F1 F2 Cmd+Shift+N Cmd+Shift+Opt+N Cmd+O Cmd+S Cmd+S Cmd+W Cmd-Option+W Cmd-Option+W Cmd-Option+W Cmd-Option+X Cmd+Option+X	Build and Reload Load All (devtoots) Test Package (Desktop) Test Package (Web) Check Package Document Package B DOCUMENTS AND APPS Preview HTML (Markdown, etc.)	Ctrl+Shift+B Ctrl+Shift+L Ctrl+Shift+T Ctrl+Shift+F Ctrl+Shift+E Ctrl+Shift+D Windows/Linu Ctrl+Shift+K	Cmd+Shift+B Cmd+Shift+L Cmd+Shift+T Cmd+Opt+F7 Cmd+Shift+E Cmd+Shift+E Cmd+Shift+D  x Mac Cmd+Shift+K
Goto File/Function Fold Selected Unfold Selected Fold All Unfold Gelected Fold All Go to line Jump to Switch to tab Previous tab Next tab First tab	Ctrl+. Alt+L Shift+Alt Alt+O Shift+Alt Shift+Alt Shift+Alt Ctrl+Shift Ctrl+F11 Ctrl+F12 Ctrl+Shift Ctrl-Shift	ws /Linux	Mac Otrl- Ind-Option+I. Ind-Option+O. Ind-Shift-Option+O. Ind-Shift-Option+G. Ind-Shift-Option+J. Itrl-Shift- Itrl-Shift- Itrl-Shift- Itrl-Shift- Itrl-Shift-	Show help for function Show source code New document New document (Chome) Open document Close document Close document (Chrone) Close all documents Extract function Extract variable Reindent lines (Un)Comment lines	F1 F2 Ctrl+Shift+N Ctrl+Alk+Shift+N Ctrl+Alk+Shift+N Ctrl+Alk+S Ctrl+W Ctrl+Alk+W Ctrl+Alk+W Ctrl+Alk+X Ctrl+Alk+X Ctrl+Alk+X Ctrl+Alk+X Ctrl+Alk+X Ctrl+Alk+X Ctrl+Alk+X	F1 F2 Cmd+Shift+N Cmd+Shift+Opt+N Cmd+Shift+Opt+N Cmd+O Cmd+O Cmd+W Cmd+Option+W Cmd+Shift+W Cmd+Option+X Cmd+Option+X Cmd+Option+V Cmd+Cmd+Option+V Cmd+N Cmd+Option+V Cmd+N	Build and Reload Load All (devtoots) Test Package (Desktop) Test Package (Web) Check Package Document Package Document Package B DOCUMENTS AND APPS Preview HTM, (Markdown, etc.) Knit Document (Jusie)	Ctrl+Shift+B Ctrl+Shift+T Ctrl+Shift+T Ctrl+Shift+E Ctrl+Shift+B Windows/Linu Ctrl+Shift+K Ctrl+Shift+K Ctrl+Shift+K Ctrl+Shift+K	Cmd+Shift+B Cmd+Shift+L Cmd+Shift+T Cmd+Opt+F7 Cmd+Shift+E Cmd+Shift+D  X Mac Cmd+Shift+K Cmd+Shift+K
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M11 - Introduction 느논의

논의

### R vs Excel

### ▶ R에서는

- 1. 한 번 했던 작업을 쉽게 재현할 수 있습니다.
- 2. 처음에는 어렵고 오래걸릴 수 도 있습니다.
- 3. 익숙해지면 빠르고 정확하게 분석을 할 수 있습니다.
- 4. 데이터 구조와 특성에 대해서 논리적으로 사고하게 됩니다.

-	Excel	R
인터페이스	GUI	Console
결과 재현	반복해서 작업	정확한 재현 가능 (Reproducible)
난이도	쉬움	초반의 학습 곡선
속도, 용량	느리고 한정적	빠르고 대용량
실수	관대함	결과물의 실수 없음이 보장
장점	눈에 보여서 직관적	추상적, 논리적 사고가 요구됨

# R vs 다른 언어들

- ▶ R Studio의 Support
  - 1. 안정적인 개발 환경을 제공합니다.
  - 2. 확장 프로그램들을 통합하여 관리합니다.
  - 3. 쉽고 직관적인 메뉴얼을 제공합니다.
- ▶ 다른 언어들과 비교
  - ▶ MATLAB: R과 가장 유사하며 수리 계산에 강점. 유료.
  - ▶ SAS: 초고용량 데이터 처리. 매우 유료.
  - ▶ C, C++: 배우기 어렵지만 빠르고 다른 언어의 토대.
  - ▶ JAVA: C와 유사하지만 주로 웹개발 용으로 쓰임.
  - ▶ Python
    - ▶ R에 비해서 난이도, 시각화, 문서화가 약점
    - ▶ 분석과 개발의 양쪽을 지원하여 인기가 높음

# R은 왜 배워야 하나요?

- ▶ 시대의 흐름
  - ▶ 데이터에 기반한 분석과 의사결정이 필수인 시대
  - ▶ 반복작업은 최대한 컴퓨터에게 맡겨야 하는 시대
  - ▶ 분석과 의사 결정을 하는 도구는 시대에 따라 진화
  - ▶ 암산 → 주판 → 엑셀 → 프로그래밍
  - ▶ 불과 20년 전에만 해도 엑셀 1급이면 전문가였습니다. 지금은 모두가 사용합니다.
  - ▶ 스마트폰에서 사진을 찍고 카톡에 첨부해서 보내는 기능도 예전에는 생소했습니다.
- ▶ 지적인 발전
  - ▶ 유소년 교육도 구구단 → 19단 → 프로그래밍으로 트렌드 변화
  - ▶ 커리어 발전을 위해 다루는 데이터 구조를 파악하고 자동으로 처리해야 합니다.
  - ▶ 비전공자가 처음으로 배우기에 가장 쉽습니다.

# 수업 과정

#### 목표

- 1. R 프로그래밍을 배웁니다.
- 2. 데이터 분석 프로젝트의 흐름을 익힙니다.
- 3. 기수강생 결과물 수준의 결과물을 만들어 냅니다.
- 4. Take it to your workplace!

# 프로젝트 과정

- 1. 분석
  - ▶ Design (가설 설정 및 디자인)
  - ▶ Analysis (데이터 분석)
- 2. 공유
  - ▶ Visulization (시각화)
  - ▶ Documentation (문서화)

# 강의 순서

주제	Module	Note
0. 강의 소개	M11, M41	
1. 기본 문법	M12, M13	
2. 첫 번째 프로젝트	M21, M22	분석, 시각화, 문서화
3. 문서화 templates	M25, M26, M27	pdf, docx
4. advanced 시각화	M23, M24	
5. advanced 문서화	M32	html 대시보드
6. 실무 프로젝트	M43, M46	
7. 데이터 다루기	M51, M52	전처리, 시계열 데이터
8. advanced 문서화	M33	동적인 html

M11 - Introduction 나수업 과정 M11 - Introduction 나수업 과정

# Survey

- 1. 이름, 이메일
- 2. 전공
- 3. 프로그래밍 경험
- 4. 직무 소개와 수강후에 직무에 어떻게 도움이 되리라 기대하는지 말씀 부탁드립니다.