1. Introduction

Who are we?

- General intro
- R/statistics experience
- Substantive interests

Outline

- Logistics of Statistics II
- Assignments
- Github
- RStudio
- RMarkdown

Logistics of Statistics II

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Submit Assignments via Github	Lecture Get Assignment via Github	Work on assignment	Labs (drop-in)	Assignment of this week / readings for next week		

Syllabus

Week	Topic / Lecture	Assignment / Lab	Week	Topic / Lecture	Assignment / Lab
1	Counterfactual Causality	Intro / Logistics (mini mock assignment)	7	Regression Discontinuity Design	assignment
2	Potential Outcomes Framework	R revision / Tidyverse (mock assignment)	8	Difference-in- Difference	assignment
3	Causal Graphs	assignment	9	Panel data	assignment
4	Regression	assignment	10	Moderation	assignment
5	Matching	assignment	11	Validity & Generalizability	Revision / tba
6	Instrumental Variables	assignment	12	Planning & Evaluating	Revision / tba

Grading

- 40% weekly assignments, submitted via GitHub
 - Deadline: 11:59 PM CET on the day before the lecture
- 25% in-class or online final exam
 - Final exam week
- 35% final replication task, submitted via GitHub
 - Deadline: 22.12.2020, 11:59 PM

Weekly assignments

- Materials will be uploaded after the lecture
- Materials will consist of:
 - RMarkdown template with questions
 - Dataset
- Your task:
 - Get the assignment via GitHub
 - Work on the assignment in an RMarkdown document (in RStudio)
 - Knit the document to an HTML file
 - Upload both the R Markdown and the HTML file via GitHub

GitHub

- Version control platform
- Industry standard in any field where people code
- Allows collaboration
- Use through terminal, RStudio or desktop client

To Do:

- Create free account
- Download GitHub Desktop
- Send your GitHub username to Moodle survey!!



Basic Concepts GitHub

- Repository: Project folder where your files are stored. Git will track changes to anything in this folder.
- Clone: make a copy of a repository so you can access it on your local machine.
- Commit: When you make changes, you commit them to "save" them.
- Push: After you make a commit, you have to push them to the repo. Otherwise, they are just saved on your local machine.
- Pull: You can pull from the repo to access any changes made by other collaborators. This will give you the most recent version.
- **README:** File with information about the project.
- .gitignore: Files that you do not want Git to track (like data you don't want to upload)
- Branch: A copy of the repo you can make changes on without affecting others.
- Merge: If there are conflicts between your local copy and the copy in the repo, sometimes you may need to open the file and choose which version of the code to keep in order to merge the two versions.

Assignments with GitHub

Statistical Modeling & Causal Inference – Oswald | Ramirez-Ruiz

Each week, you'll be invited to a new private repository for your assignment

- Step 1: clone the repo on github.com to access it on your GitHub desktop app and the linked desktop folder
- Step 2: work on the assignment in RStudio and knit your markdown document to html
- Step 3: commit your changes and click push to submit your assignment (including both, the .html and the .Rmd file)

Example GitHub



RStudio

- Download latest version of R
- Download RStudio
- IDE to use R
- Free and open source
- Interface divided into 4 panes

• • •	RStudio				
0 •	😤 🗸 🔒 🔚 🦽 Go to file/function 🛛 🛛 🔀 🔸 Addins 👻			Project: (None) 👻
🐑 Un	itled1 ×	Environment His	tory		_
(þ. d	🖉 🖳 🕺 💁 Knit 🔻 🌐 🔹 🖓 🖓 Knit 👻 🖓 🔹	📑 🔂 📑 🕞	rt Dataset 👻 🔏	📃 List •	. 6
1		🛑 Global Environm	ent - Q		
2	title: "Test"	Data			
4	date: '2021-02-02'	🔍 bigdata	200 obs. of 5 variables		
5	output: html_document	🔘 data	40 obs. of 3 variables		
6		O data_frame	8 obs. of 2 variables		
7	All for earlier include FALCE)	O data_frame2	8 obs. of 6 variables		
9	<pre>{r setup, include=rALSE} knitr::opts chunk\$set(echo = TRUE)</pre>	🔘 data2	40 obs. of 3 variables		
10		🔘 data3	8 obs. of 3 variables		
11		O df2	1 obs. of 8 variables		
12 .	## R Markdown	🔍 df3	5 obs. of 8 variables		
15	This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS	Files Plots Pac	kages Help Viewer		
4.5	Word documents. For more details on using R Markdown see < <u>http://rmarkdown.rstudio.com</u> >.				
15	When you click the **K ait ** button a document will be generated that includes both content as well as	Name	Description	Version	
10	the output of any embedded R code chunks within the document. You can embed an R code chunk like this:	Name	Description	version	
17		System Library			
18	```{r cars} @ ≚ ►	abind	Combine Multidimensional Arrays	1.4-5	8
19	summary(cars)	acs	Download, Manipulate, and Present	2.1.4	\otimes
2:1	🖬 Test 🗧 R Markdown 🗘		Decennial Data from the US Census		
Cons		AER	Applied Econometrics with R	1.2-9	8
		antiword	Extract Text from Microsoft Word Documents	1.3	8
Nat	ural language support but running in an English locale	askpass	Safe Password Entry for R, Git, and SSH	1.1	8
Ris	a collaborative project with many contributors.	 assertthat 	Easy Pre and Post Assertions	0.2.1	8
'cita	tion()' on how to cite R or R packages in publications.	backports	Reimplementations of Functions Introduced Since R-3.0.0	1.2.1	8
Type	'demo()' for some demos 'help()' for on-line help, or	base64enc	Tools for base64 encoding	0.1-3	8
'help	start()' for an HTML browser interface to help.	bayestestR	Understand and Describe Bayesian Models and Posterior Distributions	0.7.2	8
Work	race loaded from _/P/ PDstol	bdsmatrix	Routines for Block Diagonal Symmetric Matrices	1.3-4	8
Luoi.k	space touted from ~700. Routing	ВН	Boost C++ Header Files	1.72.0- 3	8
>		binman	A Binary Download Manager	012	0

Editor in RStudio

- Source for your scripts and documents
- Only commands that are typed into a script can be saved
- Press cmd + enter to send commands to the console (to be executed)
- Comment your code using #

) 🔴 🔵	RStudio					
1 • 6	🛃 💼 🚔 🖂 👍 Go to file/function 🛛 🛛 🖾 🗸 Addins 🗸				Project:	(None)
🐑 Untit	ed1 ×	Env	vironment Hist	tory		-
	🖅 🔒 📲 💁 Knit 🔹 🛞 🔹 🔯 Insert 🗸 🖓 🕞 Run 🗸 🤹 😒	1	🕞 📄 Impor	t Dataset 👻 🎻	List	- 6
1 *		4	Global Environme	ent • Q		
2	title: "Test"	Dat	a			
4	iate: '2021-02-02'	Ob	oigdata	200 obs. of 5 variables		
5	putput: html_document	00	iata	40 obs. of 3 variables		
6		00	lata_frame	8 obs. of 2 variables		
2	The potent (include_EALSE)	00	lata_frame2	8 obs. of 6 variables		
9	<pre>(nitr::opts_chunk\$set(echo = TRUE)</pre>	00	lata2	40 obs. of 3 variables		
10		00	lata3	8 obs. of 3 variables		
11		00	if2	1 obs. of 8 variables		
12 -	## R Markdown	00	If3	5 obs. of 8 variables		
14	This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS	File	s Plots Pac	kages Help Viewer		
45	Nord documents. For more details on using R Markdown see < <u>http://rmarkdown.rstudio.com</u> >.					
16	When you click the **Knit** button a document will be generated that includes both content as well as	M	Name	Description	Version	
	the output of any embedded R code chunks within the document. You can embed an R code chunk like this:	Svs	tem Library	bescription	(CISION	
17	°`{r cars} ⊚ ₹ ►	l n	abind	Combine Multidimensional Arrays	1.4-5	Ø
19	summary(cars)	ō	acs	Download, Manipulate, and Present	2.1.4	6
2:1	E Test \$ R Markdown \$			American Community Survey and Decennial Data from the US Census		
Consol	~/R/ ↔		AER	Applied Econometrics with R	1.2-9	G
		Ο	antiword	Extract Text from Microsoft Word Documents	1.3	6
Natur	al language support but running in an English Locale		askpass	Safe Password Entry for R, Git, and SSH	1.1	e
is a	collaborative project with many contributors.		assertthat	Easy Pre and Post Assertions	0.2.1	e
citati	on()' on how to cite R or R packages in publications.	Ο	backports	Reimplementations of Functions Introduced Since R-3.0.0	1.2.1	e
'vpe 'o	emo()' for some demos, 'help()' for on-line help, or		base64enc	Tools for base64 encoding	0.1-3	e
help.s	tart()' for an HTML browser interface to help.	0	bayestestR	Understand and Describe Bayesian Models and Posterior Distributions	0.7.2	e
Worksr	ace loaded from ~/R/.RData]		bdsmatrix	Routines for Block Diagonal Symmetric Matrices	1.3-4	6
			BH	Boost C++ Header Files	1.72.0 3	- 0
. 1			binman	A Binary Download Manager	0.1.2	8

Console in RStudio

- Immediate execution of R comments by the computer
- Display of results of executed commands
- Press enter to execute commands
- Shows > if ready to accept commands

	RStudio				
🔰 🗸 🥶 🖌 🔒 🔚 🍌 Go to file/function 🔰 🔛 🗸 Addins 🗸				🔋 Project:	(None
Untitled1 ×		Environment Hi	story		_
🗇 🖒 🖅 🔒 📲 🥵 Knit 🔹 🛞 🔸 🗳	🕽 Insert 🗸 👌 🕀 Run 🖌 🤹 🖛 🚍	🞯 🔒 🖃 Imp	ort Dataset 👻 🍕	E List	-
1 *		Global Environn	nent •		
2 title: "Test"		Data			
4 date: '2021-02-02'		🔍 bigdata	200 obs. of 5 variables		E
5 output: html_document		🔘 data	40 obs. of 3 variables		E
6		O data_frame	8 obs. of 2 variables		8
7		<pre> @ data_frame2 </pre>	8 obs. of 6 variables		
8 * {r setup, include=FALSE}	© ▶	🔘 data2	40 obs. of 3 variables		
10		🔘 data3	8 obs. of 3 variables		
11		0 df2	1 obs. of 8 variables		
12 - ## R Markdown		🕐 df3	5 obs. of 8 variables		1
15 14 This is an R Markdown document. Markdown is a simple formatting sy Wood documents. For more details on using R Markdown see attraction.	ntax for authoring HTML, PDF, and MS	Files Plots Pa	ckages Help Viewer		
15	nur kuowitti scuuto.com	💽 Install 🕜 U	odate		
16 When you click the **Knit** button a document will be generated th	at includes both content as well as	Name	Description	Version	1
the output of any embedded R code chunks within the document. You 17	can embed an R code chunk like this:	System Library			
18 - ```{r cars}	⊕ ≍ ►	abind	Combine Multidimensional Arrays	1.4-5	(
19 summary(cars)		acs	Download, Manipulate, and Present	2.1.4	
2:1 📴 Test 🗘	R Markdown 🗘		Decennial Data from the US Census	1	
Console ~/R/ 🗇		AER	Applied Econometrics with R	1.2-9	
		antiword	Extract Text from Microsoft Word Documents	1.3	
Natural language support but running in an English locale		askpass	Safe Password Entry for R, Git, and SSH	1.1	
is a collaborative project with many contributors.		 assertthat 	Easy Pre and Post Assertions	0.2.1	
citation()' on how to cite R or R packages in publications.		backports	Reimplementations of Functions Introduced Since R-3.0.0	1.2.1	
whe 'demo()' for some demos. 'help()' for on-line help, or		base64enc	Tools for base64 encoding	0.1-3	
help.start()' for an HTML browser interface to help.		bayestestR	Understand and Describe Bayesian Models and Posterior Distributions	0.7.2	
Workshare londed from ~/R/ RDatal		bdsmatrix	Routines for Block Diagonal Symmetric Matrices	1.3-4	
		D BH	Boost C++ Header Files	1.72.0- 3	-

Environment in RStudio

• Environment and History

- Convenient monitor for data, variables, etc
- Helps with reading in files "manually"
- Often useful to clear environment when you run into troubles

) 😑 🕘	RStudio						
. • 🞯 • 🔒 🔒	👌 📄 🚱 The file/function 🛛 🕅 🕶 🖌 Addins 🔹					🔋 Project:	(None
🖭 Untitled1 ×			Envi	ronment His	itory		-
00 2 B	💁 🦪 Knit 🔹 🛞 🗸 👘 😨 Insert 🖣 🖓 📑 🖶	tun + 🤹 + 😑	0	🔒 📄 Impo	rt Dataset 👻 🎻	📃 List	- (
1 *			6 G	lobal Environm	ent -	2	
2 title: "Test"	0		Data	1			
4 date: '2021_02_	. Uswala 27'		Obi	gdata	200 obs. of 5 variables		
5 output: html_do	cument		🔘 da	ta	40 obs. of 3 variables		
6			🔘 da	ta_frame	8 obs. of 2 variables		
7			🔘 da	ta_frame2	8 obs. of 6 variables		
8 - {r setup, in	clude=FALSE}	• •	O da	ta2	40 obs. of 3 variables		
10 ```	htssec(ello - holy		🔘 da	ta3	8 obs. of 3 variables		
11			O df	2	1 obs. of 8 variables		
12 - ## R Markdown			O df	3	5 obs. of 8 variables		
13 14 This is an D.M.	aldena desenant. Maaldena de a simila formatidas enstas for autoridas (MA)	1 DD5 and MC	-				-
14 Ints is an R Ma	rkdown document. Markdown is a simple formatting syntax for authoring HIM	IL, PDF, and MS	Files	Plots Pac	ckages Help Viewer		_
15	Tor more decutts on dating K har kdown see <u>http://find.kdown.fstudto.com</u> p.		OL I	nstall 🕜 Up	date		
16 When you click	the **Knit** button a document will be generated that includes both conte	ent as well as		Name	Description	Version	n
the output of a	ny embedded R code chunks within the document. You can embed an R code ch	unk like this:	Syste	em Library			
18 - ```{r cars}		© ⊻ ►	0	abind	Combine Multidimensional Arrays	1.4-5	8
19 summary(cars)				acs	Download, Manipulate, and Preser	t 2.1.4	6
2:1 🛱 Test 🗧		R Markdown ‡			American Community Survey and		
	=			ACD	Applied Econometrics with P	5 1.2-0	0
Console ~/R/				antiword	Extract Taxt from Microsoft Word	1.2-5	- 0
				antiworu	Documents	1.5	0
Natural language su	pport but running in an English locale			askpass	Safe Password Entry for R, Git, and	1.1	e
is a collaborative	project with many contributors.				SSH		
ype 'contributors()'	for more information and			assertthat	Easy Pre and Post Assertions	0.2.1	e
citation()' on how to	o cite R or R packages in publications.			backports	Reimplementations of Functions Introduced Since R-3.0.0	1.2.1	e
vne 'demo()' for som	demos 'heln()' for on-line heln or		0	base64enc	Tools for base64 encoding	0.1-3	e
Jpc demo() 101 30m	actions, here of the or the here, of			bayestestR	Understand and Describe Bayesian	0.7.2	6
help.start()' for an	HTML browser interface to help.		-		Models and Posterior Distributions	>	
help.start()' for an ype 'q()' to quit R.	HTML browser interface to help.			bdsmatrix	Models and Posterior Distributions Routines for Block Diagonal Symmetric Matrices	1.3-4	e
'help.start()' for an Type 'q()' to quit R. Workspace loaded from	HTML browser interface to help. n ~/R/.RData]			bdsmatrix BH	Models and Posterior Distributions Routines for Block Diagonal Symmetric Matrices Boost C++ Header Files	1.3-4 1.72.0 3	0 I- 0

Rest in RStudio

- Files/Plots/Packages/Help/ Viewer
- Displays Plots and Tables
- Overview of installed and loaded packages
- Help to learn more about packages and functions

•••	RStudio				
🔹 🚭 🔹 🔜 🔒 🍌 Go to file/function 🛛 🔯 🔹 Addins 🔹				Project: ((None
Untitled1 ×		Environment His	story		-
🗇 🖒 🔎 🔒 😼 🙀 Knit 🔹 🛞 🔹	🔁 Insert 🔹 🏠 🕘 🕘 Run 🔹 🤹 📼	🞯 🔒 🖃 Impo	ort Dataset 👻 🔏	📄 List	- (
1 *		Global Environm	ient • Q		
2 title: "Test"		Data			
4 date: '2021-02-02'		🔍 bigdata	200 obs. of 5 variables		
5 output: html_document		🔘 data	40 obs. of 3 variables		
6		<pre>O data_frame</pre>	8 obs. of 2 variables		
7		<pre>O data_frame2</pre>	8 obs. of 6 variables		
8 * ```{r setup, include=FALSE}	· •	0 data2	40 obs. of 3 variables		
9 khitr::opts_chunk\$set(echo = TRUE)		O data3	8 obs. of 3 variables		
11		O df2	1 obs of 8 variables		
12 - ## R Markdown		0 df3	5 obs of 8 variables		
13					
14 This is an R Markdown document. Markdown is a simple formatting s Word documents. For more details on using R Markdown see http://	syntax for authoring HTML, PDF, and MS (rmarkdown.rstudio.com>.	Files Plots Pa	ckages Help Viewer		-
15		🔟 Install 🛛 🕜 Up	date Q.		
16 When you click the **Knit** button a document will be generated t	hat includes both content as well as	Name	Description	Version	
the output of any embedded R code chunks within the document. You	can embed an R code chunk like this:	System Library			
18 - ```{r cars}	(a) x +	abind	Combine Multidimensional Arrays	1.4-5	
19 summanu(cons)					
19 Summury (Curs)		acs	Download, Manipulate, and Present	2.1.4	
summary(cars) a ``` Test ≙	R Markdown ⇔	acs	Download, Manipulate, and Present American Community Survey and	2.1.4	
2 Summury (curs)	R Markdown 🗘	acs	Download, Manipulate, and Present American Community Survey and Decennial Data from the US Census	2.1.4	
2.1 i i Test ÷ =	R Markdown ‡	acs AER	Download, Manipulate, and Present American Community Survey and Decennial Data from the US Census Applied Econometrics with R	2.1.4	e
13 soundry (Curs) 2:1	R Markdown ÷	 AER antiword 	Download, Manipulate, and Present American Community Survey and Decennial Data from the US Census Applied Econometrics with R Extract Text from Microsoft Word Documents	2.1.4 1.2-9 1.3	0
ansole ~/R/ ☆ Natural language support but running in an English locale	R Markdown ÷	AER AER antiword askpass	Download, Manipulate, and Present American Community Survey and Decennial Data from the US Census Applied Econometrics with R Extract Text from Microsoft Word Documents Safe Password Entry for R, Git, and set	2.1.4 1.2-9 1.3 1.1	6
An a solution (curs) 2.1	R Markdown S	AER AINING ASPECT	Download, Manipulate, and Present American Community Survey and Decennial Data from the US Census Applied Econometrics with R Extract Text from Microsoft Word Documents Safe Password Entry for R, Git, and SSH	2.1.4 1.2-9 1.3 1.1	0000
An animal y(turs) ansole ~/R/ ∞ Natural language support but running in an English locale is a collaborative project with many contributors. pe 'contributors()' for more information and	R Markdown ÷	 AER antiword askpass assertthat backports 	Download, Manipulate, and Present American Community Survey and Decennial Data from the US Census Applied Econometrics with R Extract Text from Microsoft Word Documents Safe Password Entry for R, Git, and SSH Easy Pre and Post Assertions Baimplementations of Euroritons	2.1.4 1.2-9 1.3 1.1 0.2.1	0000
As sound y(turs) 21 0 Test = ansole ~/R/ ← Natural language support but running in an English locale is a collaborative project with many contributors. pe 'contributors()' for more information and itation()' on how to cite R or R packages in publications.	R Markdown ÷	AER AER antiword askpass assertthat backports	Download, Manipulate, and Present American Community Survey and Decennial Data from the US Census Applied Econometrics with R Extract Text from Microsoft Word Documents Safe Password Entry for R, Git, and SSH Easy Pre and Post Assertions Reimplementations of Functions Introduced Since R=3.0.0	2.1.4 1.2-9 1.3 1.1 0.2.1 1.2.1	0000
As soundry (turs) 22.1 ■ Test = onsole ~/R/ ⇔ Natural language support but running in an English locale is a collaborative project with many contributors. pe 'contributorsO' for more information and itationO' on how to cite R or R packages in publications. me 'demO(') for some demos. 'helo(') for on-line helo. or	R Markdown S	AER AER AINWORd Askpass Assertthat backports base64enc	Download, Manipulate, and Present American Community Survey and Decennial Data from the US Census Applied Econometrics with R Extract Text from Microsoft Word Documents Safe Password Entry for R, Git, and SSH Easy Pre and Post Assertions Reimplementations of Functions Introduced Since R-3.0.0 Tools for base64 encoding	2.1.4 1.2-9 1.3 1.1 0.2.1 1.2.1 0.1-3	000000000000000000000000000000000000000
<pre>13 soundry(turs) 21 Test > onsole ~/R/ ∞ Natural language support but running in an English locale is a collaborative project with many contributors. pe 'contributorsO' for more information and itation()' on how to cite R or R packages in publications. pe 'demo()' for some demos, 'help()' for on-line help, or elp.start()' for an HTML browser interface to help. </pre>	R Markdown S	 Acs AER antiword askpass assertthat backports base64enc bayestestR 	Download, Manipulate, and Present American Community Survey and Decennial Data from the US Census Applied Econometrics with R Extract Text from Microsoft Word Documents Safe Password Entry for R, Git, and SSH Easy Pre and Post Assertions Reimplementations of Functions Introduced Since R-3.0.0 Tools for base64 encoding Understand and Describe Bayesian Models and Posterior Distributions	2.1.4 1.2-9 1.3 1.1 0.2.1 1.2.1 0.1-3 0.7.2	
As a summing (curs) 21	R Markdown ÷	 acs AER antiword askpass assertthat backports base64enc bayestestR bdsmatrix 	Download, Manipulate, and Present American Community Survey and Decennial Data from the US Census Applied Econometrics with R Extract Text from Microsoft Word Documents Safe Password Entry for R, Git, and SSH Easy Pre and Post Assertions Reimplementations of Functions Introduced Since R-3.0.0 Tools for base64 encoding Understand and Describe Bayesian Models and Posterior Distributions Routines for Block Diagonal Symmetric Martices	2.1.4 1.2-9 1.3 1.1 0.2.1 1.2.1 0.1-3 0.7.2 1.3-4	
<pre>3 simuly(Curs) 21 Test = Console ~/R/ Console ~/R/ Console ~/R/ Signal Console Console</pre>	R Markdown ÷	 acs AER antiword askpass assertthat backports base64enc bayestestR bdsmatrix BH 	Download, Manipulate, and Present American Community Survey and Decennial Data from the US Census Applied Econometrics with R Extract Text from Microsoft Word Documents Safe Password Entry for R, Git, and SSH Easy Pre and Post Assertions Reimplementations of Functions Introduced Since R-3.0.0 Tools for base64 encoding Understand and Describe Bayesian Models and Posterior Distributions Routines for Block Diagonal Symmetric Marrices Boost C++ Header Files	2.1.4 1.2-9 1.3 1.1 0.2.1 1.2.1 0.1-3 0.7.2 1.3-4 1.72.0- 3	

R Markdown

RMarkdown is an authoring framework for data science. A single RMarkdown file can be used to:

- Save and execute code
- Generate high quality reports that can be shared with an audience

We will use RMarkdown to submit our weekly assignments.



Headers in Rmarkdown

 YAML headers surrounded by "---"
 Mote data that guides the

Meta-data that guides the file build-up process.



R Code in Rmarkdown

- R code chunks surrounded by ```
- Chunks take code as an input. It works just like usual R code.

start a chunk: ``` { r }
end a chunk: ```



Text in Rmarkdown

 Text mixed with simple text formatting Takes text as input.

H1
H2
H3
bold text
<pre>*italicized text*</pre>
> blockquote
1. First item
2. Second item
3. Third item
- First item
– Second item
- Third item
`code`

Statistical Modeling & Causal Inference – Oswald | Ramirez-Ruiz

• • •		~/Documents/rmarkdown -
9 . • 😂	🕇 🔹 🔚 🗧 🗍 🌧 Go to file/function 👘 🚦 🔹 🔣 🔹 Addins 🔹	
♥ 1-ex	ample.Rmd ×	
1 · 2 3 4 5	<pre>title: "Viridis Demo" output: html_document</pre>	
6 - 7 8	<pre>include = FALSE} library(viridis)</pre>	⊕ ≍ ►
9 10 11 12- 13	The code below demonstrates two color palettes in [viridis](https://github.com/sjmgarnier/viridis) p plot displays a contour map of the Maunga Whau vol Auckland, New Zealand. ## Viridis colors	the ackage. Each .cano in
14 - 15 16	<pre>```{r} image(volcano, col = viridis(200)) ```</pre>	0 ± +
18 - 19	## Magma colors	
20 - 21 22 23	<pre>image(volcano, col = viridis(200, option = "A"))</pre>	⊕ ⊻ ►
1:1	Viridis Demo o	R Markdown 🗧
Consol	•	50

Mini Mock Assignment

- Get R, RStudio and GitHub Desktop running
- Generally, revise some R basics
- If you can, try to get the assignment via GitHub
- Look at the assignment, complete the tasks, push to GitHub
- We'll download and upload the assignment again together next week ^(C)

Coding issues

Statistical Modeling & Causal Inference – Oswald | Ramirez-Ruiz

First, don't panic, take a step back. Then:

- 1. Check your code (missing parentheses, packages, stray commas, etc.)
- 2. Google the error message
- 3. Search on Stackoverflow or look on YouTube
- 4. Ask for help (from stackoverflow, friends, or your TA)

Further Resources

- Reminder of the basics: <u>https://tinyurl.com/vkebh2f</u>
- A comprehensive guide to R: http://qpolr.com/
- RMarkdown: The definitive guide <u>https://tinyurl.com/y4tyfqmg</u>
- For any coding issues https://stackoverflow.com/
- Hertie's Data Science Lab Research Consulting