

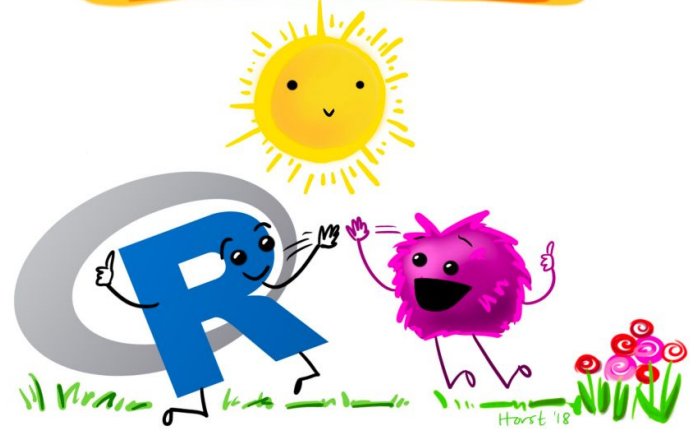
# لغة الآر من الصفر إلى الإحتراف

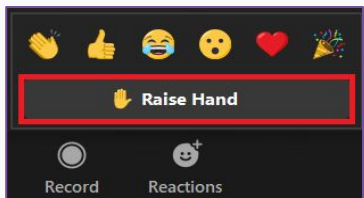
at first I was like...



Credit: Allison Horst

...but now it's like...





# قواعد الدورة

● كتابة الاسم في Google Doc

○ الإجابة على Icebreaker question

● إطفاء الجوال

● يُفضل فتح الكاميرا

● لا تتردد في طرح أي سؤال خلال الجلسة

● Slack

مرحبا في كورس "لغة الأر (R) من الصفر إلي الإحتراف"

المدرية: د بتول المزوق

الأسبوع: الأول

التاريخ: ٢٢ يونيو ٢٠٢٢

وصف الجلسة:

في هذه الجلسة سنتعرف على الخطة التعليمية مع بيان أهمية استخدام لغة آر (R) وإبراز دورها المميز في علم البيانات. لغة آر (R) هي لغة مفتوحة المصدر تُستخدم في التمثيل المرئي للبيانات وتعدديتها، بالإضافة إلى النمذجة. وقد احتلت أعلى المراتب في تصنيفات لغات البرمجة المستخدمة في علوم البيانات على مدار عدة سنوات، مما أدى إلى تزايد استخدامها.

تسجيل الأسماء

الاسم / المدينة / حسابات وسائل التواصل الاجتماعي لمن يرغب (twitter و GitHub وما إلى ذلك)

- 
- 
- 
- 
- 
- 
- 



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



## خطة الدورة التدريبية

الأسبوع	نوع المحاضرة	اليوم	التاريخ	الساعة (بتوقيت السعودية)	المدة بالساعات
الرابع	محاضرة مباشرة	الخميس	28 يوليو 2022	من ١١:٣٠ إلى ١٣:٣٠ مساءً	1
الخامس	محاضرة مباشرة	الثلاثاء	2 أغسطس 2022	من ١٣:٣٠ إلى ٥:٣٠ مساءً	2
	محاضرة مباشرة	الأربعاء	3 أغسطس 2022	من ٢:٣٠ إلى ٤:٣٠ مساءً	2
	ساعة مكتبية	الثلاثاء	2 أغسطس 2022	من ٢:٣٠ إلى ٣:٣٠ مساءً	1
السادس	محاضرة مباشرة	الثلاثاء	9 أغسطس 2022	من ١٣:٣٠ إلى ٥:٣٠ مساءً	2
	محاضرة مباشرة	الأربعاء	10 أغسطس 2022	من ٢:٣٠ إلى ٤:٣٠ مساءً	2
	ساعة مكتبية	الأربعاء	10 أغسطس 2022	من ٥:٣٠ إلى ٥:٣٠ مساءً	1
السابع	عرض المشروعات النهائية	الأربعاء	17 أغسطس 2022	من ٢:٣٠ إلى ٤:٣٠ مساءً	2
	عرض المشروعات النهائية	الخميس	18 أغسطس 2022	من ١٢:٣٠ إلى ٢:٣٠ مساءً	2

One-to-one Sessions this Thursday  
And optional Terminal Session



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



One-to-one Sessions this Thursday  
And optional Terminal Session



@OpenSciSaudi, @batool664



[www.osc-ksa.com](http://www.osc-ksa.com)



[batool@liverpool.ac.uk](mailto:batool@liverpool.ac.uk)



## تجهيز لجلسات هذا الأسبوع

---

```
install.packages(c("usethis", "devtools", "roxygen2",  
"janitor", "renv"))
```



@OpenSciSaudi, @batool664



[www.osc-ksa.com](http://www.osc-ksa.com)



[batool@liverpool.ac.uk](mailto:batool@liverpool.ac.uk)



# مشاكل GitHub

---

- `install.packages('usethis')`
- `usethis::use_git_config(user.name = "BatoolMM", user.email = "jane@example.org")`
- `usethis::create_github_token()`

Copy the token and add it after the following step:

- `credentials::gitcreds_set()`



# What we will learn this week?

- Going deeper with R Markdown
- Publishing R Markdown
- Creating a blog with R Markdown
- SQL and R
- Joining datasets
- Saving plots and data
- Encapsulating computational environment with `renv`
- Reshaping data with `pivot\_longer` and `pivot\_wider`
- Creating custom functions and loops
- `reprex` and filing issues in GH
- Datetimes and factors
- Modelling
- The difference between lists/dataframes/tibble



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



# مراجعة



@OpenSciSaudi, @batool664



[www.osc-ksa.com](http://www.osc-ksa.com)



[batool@liverpool.ac.uk](mailto:batool@liverpool.ac.uk)







@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



# كيفية قراءة البيانات في R

```
read_csv("path")
```

In relative to the working directory using `setwd()`

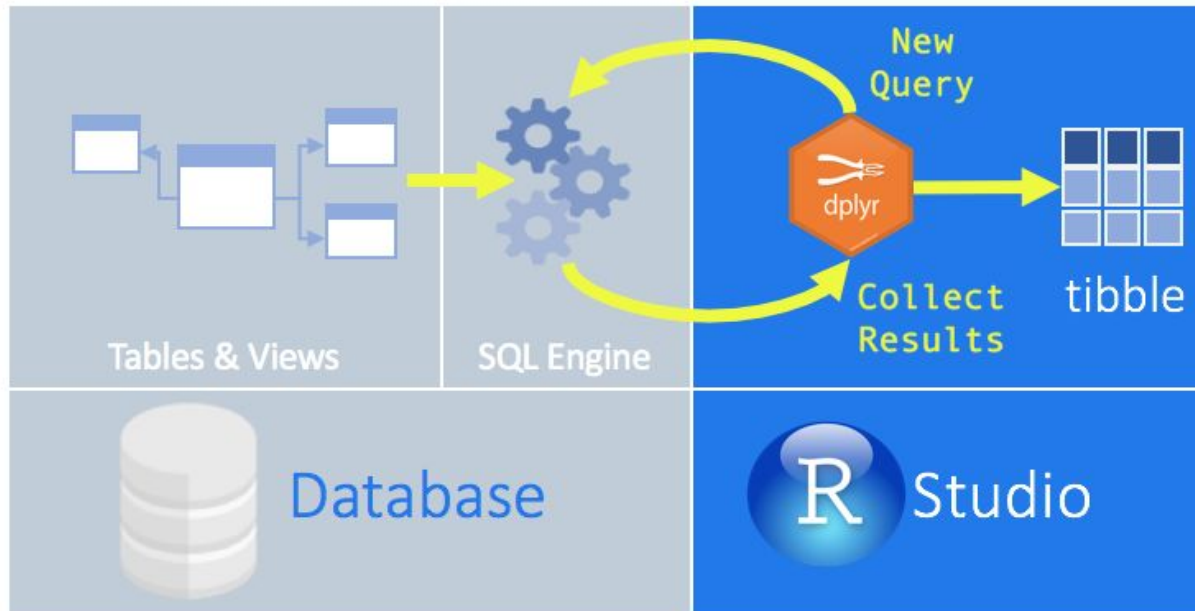
```
read_csv(here("folder", "file"))
```

```
read_csv(here("data", "data.csv"))
```



# كيفية قراءة البيانات في R

Use dplyr to interact with the database



مثال



معنى هذا الرمز في لغة R

( و تُم ) = %>%

dataset %>%

select(**column**)

# Data transformation with dplyr : : CHEAT SHEET



dplyr functions work with pipes and expect tidy data. In tidy data:



Each variable is in its own column

Each observation, or case, is in its own row

x %>% f(y) becomes f(x, y)

## Summarise Cases

Apply **summary functions** to columns to create a new table of summary statistics. Summary functions take vectors as input and return one value (see back).

### summary function



**summarise(data, ...)**  
Compute table of summaries.  
summarise(mtcars, avg = mean(mpg))



**count(data, ..., wt = NULL, sort = FALSE, name = NULL)** Count number of rows in each group defined by the variables in ... Also **tally()**.  
count(mtcars, cyl)

## Group Cases

Use **group\_by(data, ...)**, `add = FALSE`, `drop = TRUE` to create a "grouped" copy of a table grouped by columns in ... dplyr functions will manipulate each "group" separately and combine the results.



**group\_by(mtcars, cyl) %>% summarise(avg = mean(mpg))**

Use **rowwise(data, ...)** to group data into individual rows. dplyr functions will compute results for each row. Also apply functions to list-columns. See tidy cheat sheet for list-column workflow.



**rowwise(starwars) %>% mutate(film\_count = length(films))**

**ungroup(x, ...)** Returns ungrouped copy of table.  
ungroup(g\_mtcars)



## Manipulate Cases

### EXTRACT CASES

Row functions return a subset of rows as a new table.



**filter(data, ..., \_preserve = FALSE)** Extract rows that meet logical criteria.  
filter(mtcars, mpg > 20)



**distinct(data, ..., \_keep\_all = FALSE)** Remove rows with duplicate values.  
distinct(mtcars, gear)



**slice(data, ..., \_preserve = FALSE)** Select rows by position.  
slice(mtcars, 10:15)



**slice\_sample(data, ..., n, prop, weight\_by = NULL, replace = FALSE)** Randomly select rows. Use `n` to select a number of rows and `prop` to select a fraction of rows.  
slice\_sample(mtcars, n = 5, replace = TRUE)



**slice\_min(data, order\_by, ..., n, prop, with\_ties = TRUE)** and **slice\_max()** Select rows with the lowest and highest values.  
slice\_min(mtcars, mpg, prop = 0.25)



**slice\_head(data, ..., n, prop)** and **slice\_tail()** Select the first or last rows.  
slice\_head(mtcars, n = 5)

### Logical and boolean operators to use with filter()

`==` `<` `<=` `is.na()` `%in%` `|` `xor()`  
`!=` `>` `>=` `!is.na()` `!` `&`

See ?base::Logic and ?Comparison for help.

### ARRANGE CASES



**arrange(data, ..., by\_group = FALSE)** Order rows by values of a column or columns (low to high), use with **desc()** to order from high to low.  
arrange(mtcars, mpg)  
arrange(mtcars, desc(mpg))

### ADD CASES



**add\_row(data, ..., before = NULL, after = NULL)**  
Add one or more rows to a table.  
add\_row(cars, speed = 1, dist = 1)

## Manipulate Variables

### EXTRACT VARIABLES

Column functions return a set of columns as a new vector or table.



**pull(data, var = -1, name = NULL, ...)** Extract column values as a vector, by name or index.  
pull(mtcars, wt)



**select(data, ...)** Extract columns as a table.  
select(mtcars, mpg, wt)



**relocate(data, ..., before = NULL, after = NULL)**  
Move columns to new position.  
relocate(mtcars, mpg, cyl, after = last\_col())

### Use these helpers with select() and across()

e.g. `select(mtcars, mpg:cyl)`  
**contains(match)** **num\_range(prefix, range)** ; e.g. `mpg:cyl`  
**ends\_with(match)** **all\_of(x)**/**any\_of(x, ..., vars)** ; e.g. `gear`  
**starts\_with(match)** **matches(match)** **everything()**

### MANIPULATE MULTIPLE VARIABLES AT ONCE



**across(cols, funs, ..., \_names = NULL)** Summarise or mutate multiple columns in the same way.  
summarise(mtcars, across(everything(), mean))



**c\_across(cols)** Compute across columns in row-wise data.  
transmute(rowwise(UKgas), total = sum(c\_across(1:2)))

### MAKE NEW VARIABLES

Apply **vectorized functions** to columns. Vectorized functions take vectors as input and return vectors of the same length as output (see back).

### vectorized function



**mutate(data, ..., \_keep = "all", \_before = NULL, \_after = NULL)** Compute new column(s). Also **add\_column()**, **add\_count()**, and **add\_tally()**.  
mutate(mtcars, gpm = 1 / mpg)



**transmute(data, ...)** Compute new column(s), drop others.  
transmute(mtcars, gpm = 1 / mpg)



**rename(data, ...)** Rename columns. Use **rename\_with()** to rename with a function.  
rename(cars, distance = dist)



# ggplot2: Build a data MASTERPIECE



HORST '18



@OpenSciSaudi, @batool664



www.osc-ksa.com

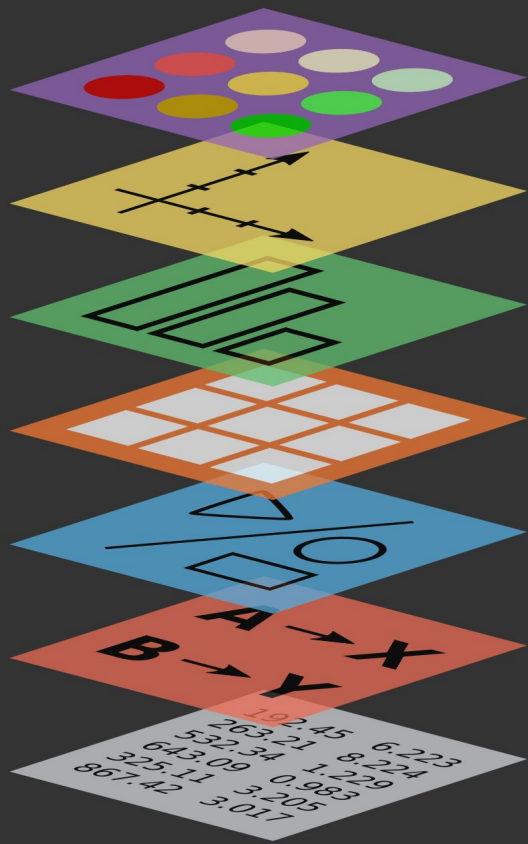


batool@liverpool.ac.uk





**Theme**  
**Coordinates**  
**Statistics**  
**Facets**  
**Geometries**  
**Aesthetics**  
**Data**



@batool664 @OpenSciSaudi









YAMIL

# YAML Header in R Markdown File

```
1 ---
2 title: "Example"
3 author: "Zachary M. Smith"
4 date: "November 16, 2018"
5 output:
6   html_document:
7     toc: true
8     number_sections: true
9     toc_float: true
10    theme: cerulean
11 ---
```



# Rendered YAML Header

1 R Markdown

2 Including Plots

## Example

Zachary M. Smith

November 16, 2018


1 R Markdown


2 Including Plots



Publish

**Publish To**

 **RPubs**  
RPubs is a free service from RStudio for sharing documents on the web. >

 **RStudio Connect**  
RStudio Connect is a server product from RStudio for secure sharing of applications, reports, plots, and APIs. >

Cancel



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk





# RStudio تصميم مدونة من داخل

# Blog Your Educational Journey!

---



**Medium**



*Create Your Blog in R*



@OpenSciSaudi, @batool664



[www.osc-ksa.com](http://www.osc-ksa.com)



[batool@liverpool.ac.uk](mailto:batool@liverpool.ac.uk)





<b>Learning curve</b>	harder	easier
<b>R dependencies</b>	rmarkdown + blogdown	rmarkdown + distill
<b>External dependencies</b>	hugo; hugo theme	none
<b>Supporting tools</b>	hugo templating; CSS	CSS; pandoc
<b>Style customization</b>	limitless	colors & fonts via themer
<b>Page layout</b>	depends on hugo theme	limited



@OpenSciSaudi, @batool664



[www.osc-ksa.com](http://www.osc-ksa.com)



[batool@liverpool.ac.uk](mailto:batool@liverpool.ac.uk)





## R Weekly

نشرة اسبوعية في كل ما هو جديد في لغة الآر و بودكاست

**دائما .. انشر مشاريعك أو مقالاتك الجديدة على المنصة!**



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



The screenshot shows the Piping Hot Data blog homepage. The header is red with the site name and a search bar. Navigation links for Home, Blog, Talks, About, CV, and social media icons are present. The main content area features three blog posts:

- Locating R and R Adjacent Software and Configuration Files** (June 2, 2022): A post about Windows 10 administration. It includes a terminal screenshot showing directory listings for various system paths like Program Files, Git, and OneDrive.
- Code line highlighting in Quarto reveals presentations** (May 12, 2022): A post about code highlighting. It includes a screenshot of a code editor with three lines highlighted in blue, labeled 'Highlight line 1', 'Highlight line 2', and 'Highlight line 3'.
- Report Ready PDF tables with rmarkdown, knitr, kableExtra, and LaTeX** (Jan. 24, 2022): A post about generating PDF tables. It includes a screenshot of a table with columns for 'Observations', 'Area', 'Change', and 'Area'.

On the right side, there is a 'SUBSCRIBE' section with a text input field and a 'Subscribe' button.

## Piping Hot data



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk







Studio AI Blog Search... Home Gallery About Contributing


## RStudio AI Blog

June 9, 2022  
Tomasz Kalinowski

### TensorFlow and Keras 2.9

TENSORFLOW/KERAS | PACKAGES/RELEASES

New TensorFlow and Keras releases bring improvements big and small.




May 31, 2022  
Tomasz Kalinowski

### Deep Learning with R, 2nd Edition

TENSORFLOW/KERAS

Announcing the release of "Deep Learning with R, 2nd Edition," a book that shows you how to get started with deep learning in R.

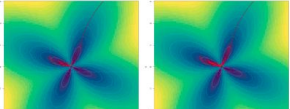


May 18, 2022  
Sigrid Keydana

### Community spotlight: Fun with torchopt

TORCH | PACKAGES/RELEASES

Today, we want to call attention to a highly useful package in the torch ecosystem: torchopt. It extends torch by providing a set of popular optimization algorithms not available in the base library. As this post will show, it is also fun to use!



SUBSCRIBE

Enjoy this blog? Get notified of new posts by email:

Email:

Please check this box if you accept the RStudio privacy policy:

Posts also available at [r-bloggers](#)

CATEGORIES

- Articles (114)
- AI & Society (1)
- Audio Processing (3)
- Bayesian Modeling (4)
- Cloud (3)
- Concepts (12)
- Data Management (2)
- Distributed Computing (9)
- Explainability (2)
- Image Recognition & Image Processing (18)
- Meta (6)
- Natural Language Processing (9)
- Packages/Releases (27)
- Privacy & Security (4)
- Probabilistic ML/DL (12)
- Spatial Data (4)
- Tabular Data (7)
- TensorFlow/Keras (63)
- Time Series (17)
- Torch (23)
- Unsupervised Learning (10)

## R Studio AI Blog



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



You will end up with these files in your project. The most critical files are the `index.Rmd` and the `_site.yml`, and we mention a little about them below.

```
.
├── .Rproj.user
├── .nojekyll
├── _site.yml
├── about.Rmd
├── docs
├── index.Rmd
└── mydistillsite.Rproj
```

Close RStudio and re-open your site by clicking on the project file ( `.Rproj` ).



When you re-open the project, you may notice the `.Rproj` file shows up in your Git pane, which means that the file has changed since your last commit. What happened? RStudio has detected that you have built a website, so a single line has been added to your `.Rproj` file:

```
BuildType: Website
```



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



# يساعد في إعدادات الموقع `_site.yml`

```
name: "my-website"
navbar:
  title: "My Website"
  left:
    - text: "Home"
      href: index.html
    - text: "About"
      href: about.html
```

My Website Home About

## My Website

Hello, Website!

For more information about simple R Markdown websites, please see [site.html](#).

Please also note that simple R Markdown sites are *not* based on HTML documents. For larger-scale and more sophisticated websites (e.g. <https://github.com/rstudio/blogdown>).

مثال



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



creative\_commons: CC BY  
citation\_url: <https://rstudio.github.io/distill>



#### Reuse

Text and figures are licensed under Creative Commons Attribution [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/). The figures that have been reused from other sources don't fall under this license and can be recognized by a note in their caption: "Figure from ...".

#### Citation

For attribution, please cite this work as

```
Almarzoug (2022, Aug. 3). I love R blog: How did I learn R. Retrieved from  
https://rstudio.github.io/distill
```

#### BibTeX citation

```
@misc{almarzoug2022how,  
  author = {Almarzoug, Batool},  
  title = { I love R blog: How did I learn R},  
  url = {https://rstudio.github.io/distill},  
  year = {2022}  
}
```



@OpenSciSaudi, @batool664



[www.osc-ksa.com](http://www.osc-ksa.com)



[batool@liverpool.ac.uk](mailto:batool@liverpool.ac.uk)



Build your own blog and publish it in Netlify or  
**GitHub pages**



@OpenSciSaudi, @batool664



[www.osc-ksa.com](http://www.osc-ksa.com)



[batool@liverpool.ac.uk](mailto:batool@liverpool.ac.uk)





## Building Websites in R with Distill

- Build a website from scratch in R using the distill package.
- Show tips and tricks for building websites in R.
- Get a fully functioning and live website.

📅 9 August 2022

🕒 5:00 p.m - 6:00 p.m (GTM+4)

📍 Online

🐦 OmanRusers

meetup



Jennifer Sloane

Ph.D. student studying  
cognitive psychology at  
UNSW.

# معلومات إضافية

<https://rstudio4edu.github.io/rstudio4edu-book/make-distill.html>



@OpenSciSaudi, @batool664



www.osc-ksa.com



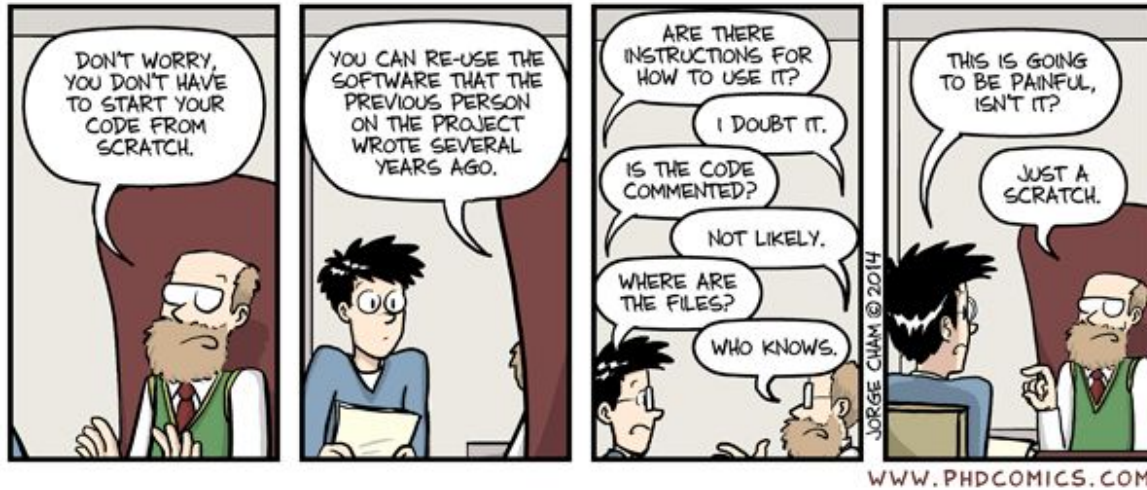
batool@liverpool.ac.uk





Encapsulating computational environment with `renv`

# أزمة إعادة التكرار والإنتاج (Reproducibility Crisis)



Credit: Gify



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk





# أزمة إعادة التكرار والإنتاج (Reproducibility Crisis)



nature  
human behaviour

LETTERS

<https://doi.org/10.1038/s41562-018-0399-z>

**Evaluating the replicability of social science experiments in *Nature* and *Science* between 2010 and 2015**

Popular Latest

*The Atlantic*

Only through November 30: Try subscriber newsletters for free

SCIENCE

**Psychology's Replication Crisis Is Running Out of Excuses**

Another big project has found that only half of studies can be repeated. And this time, the usual explanations fall flat.

By Ed Yong

## The \$28 Billion a Year Research Reproducibility Crisis

📅 October 19, 2015

The biggest crisis in the future of healthcare has nothing to do with the kind of issues that politicians talk about, such as payment systems and accessibility. Since cost-effective solutions to tragic and costly conditions like heart disease, dementia, diabetes, and cancer depend on bringing to market new treatments that rely upon genomics, nanotechnology, and molecular biology, the *biggest* problem is that at least half of the research money we invest in them is wasted. How can this be? What are the implications? What are the solutions? We'll show you.



@OpenSciSaudi, @batool664



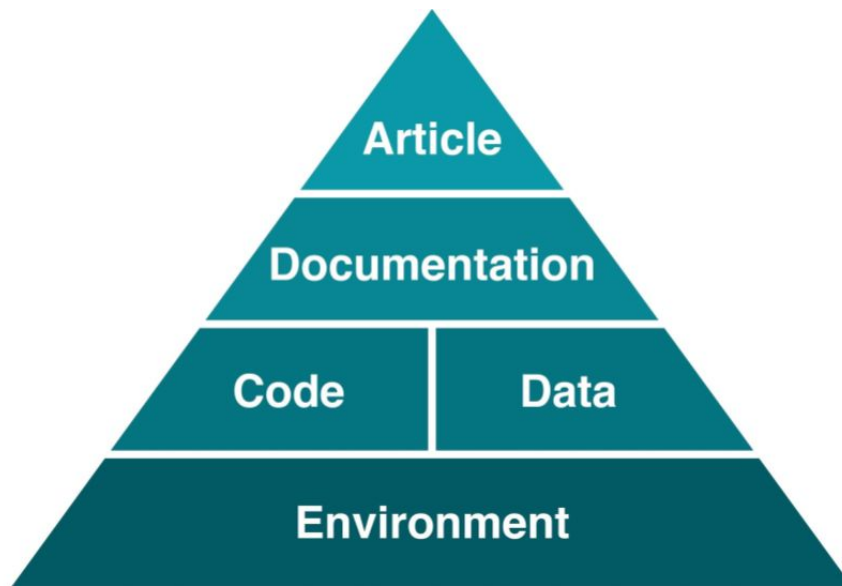
[www.osc-ksa.com](http://www.osc-ksa.com)



[batool@liverpool.ac.uk](mailto:batool@liverpool.ac.uk)



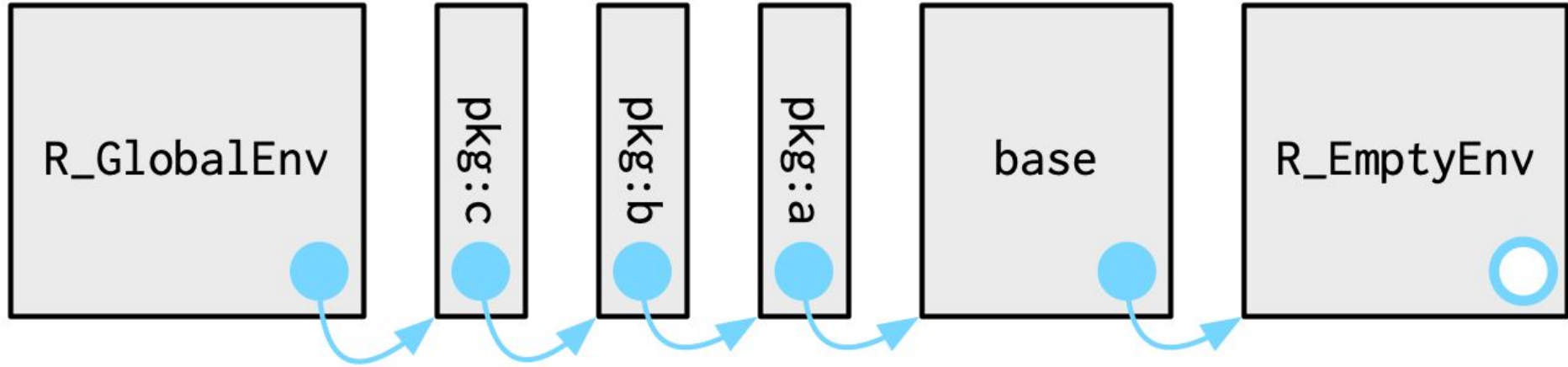
# أزمة إعادة التكرار والإنتاج (Reproducibility Crisis)

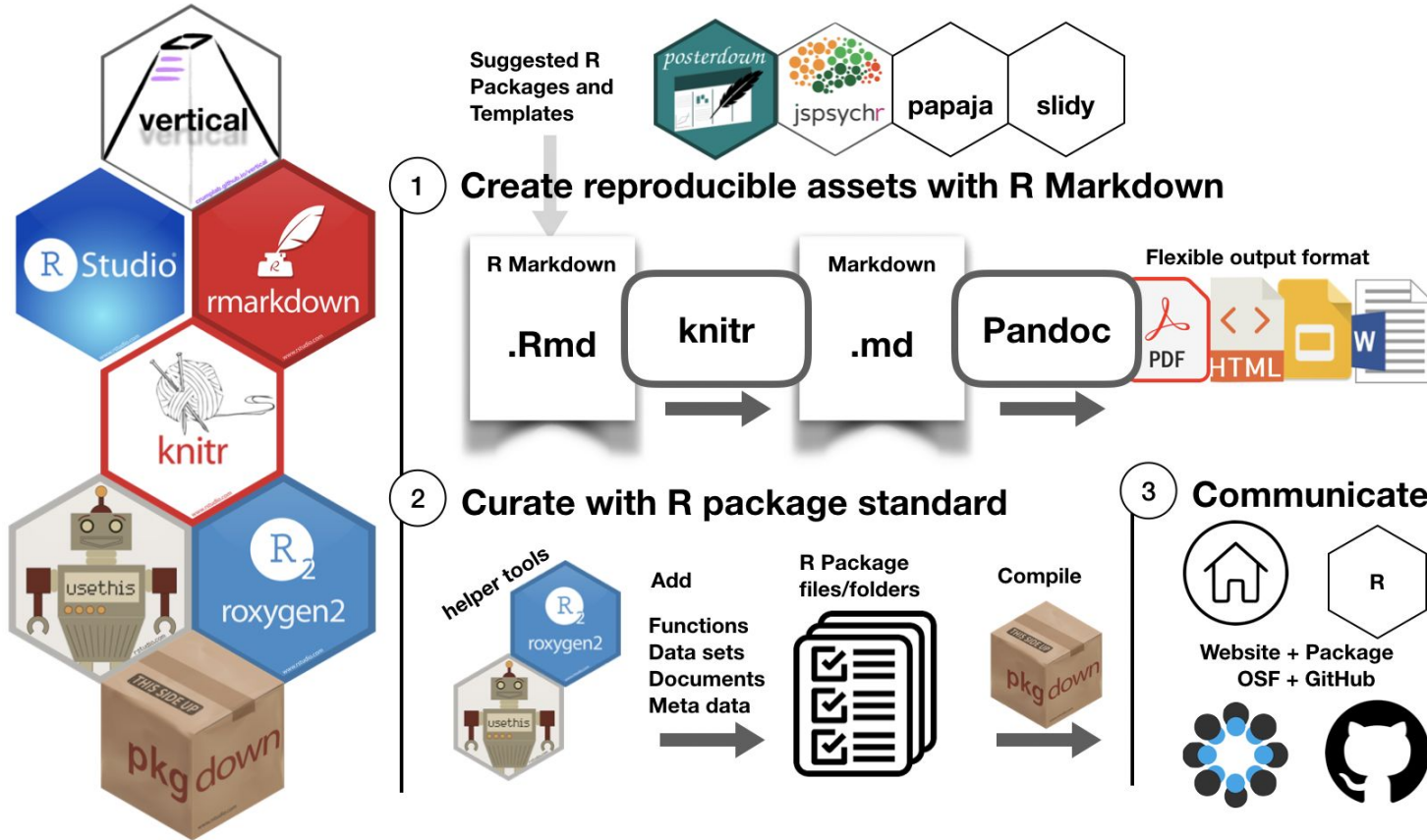


Credit: [coderefinery](#)



# أزمة إعادة التكرار والإنتاج (Reproducibility Crisis)





@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



# أزمة إعادة التكرار والإنتاج (Reproducibility Crisis)



## Levels of Research Reproducibility



Trying things out in the R Console pane, saving tables and figures to named files.



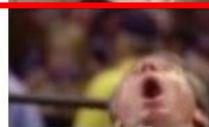
Writing code in an RScript or Rmarkdown file, generating saved tables, figures, and manuscripts that can be re-run if needed.



Using Projects and {here}, sharing code, documenting with README and comments, doing code review, and sharing code publicly on GitHub



All of the above, plus public sharing of code and data, and preserving your local package environment with {renv}

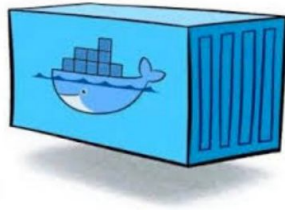


All of the above plus encapsulating the entire computing environment (R, packages, code) in a Docker image.



# Docker + renv to the rescue!

Fixed dev  
environment



+



renv lockfile

Push changes



Docker Hub



GitHub

Dedicated to a  
project



@OpenSciSaudi, @batool664



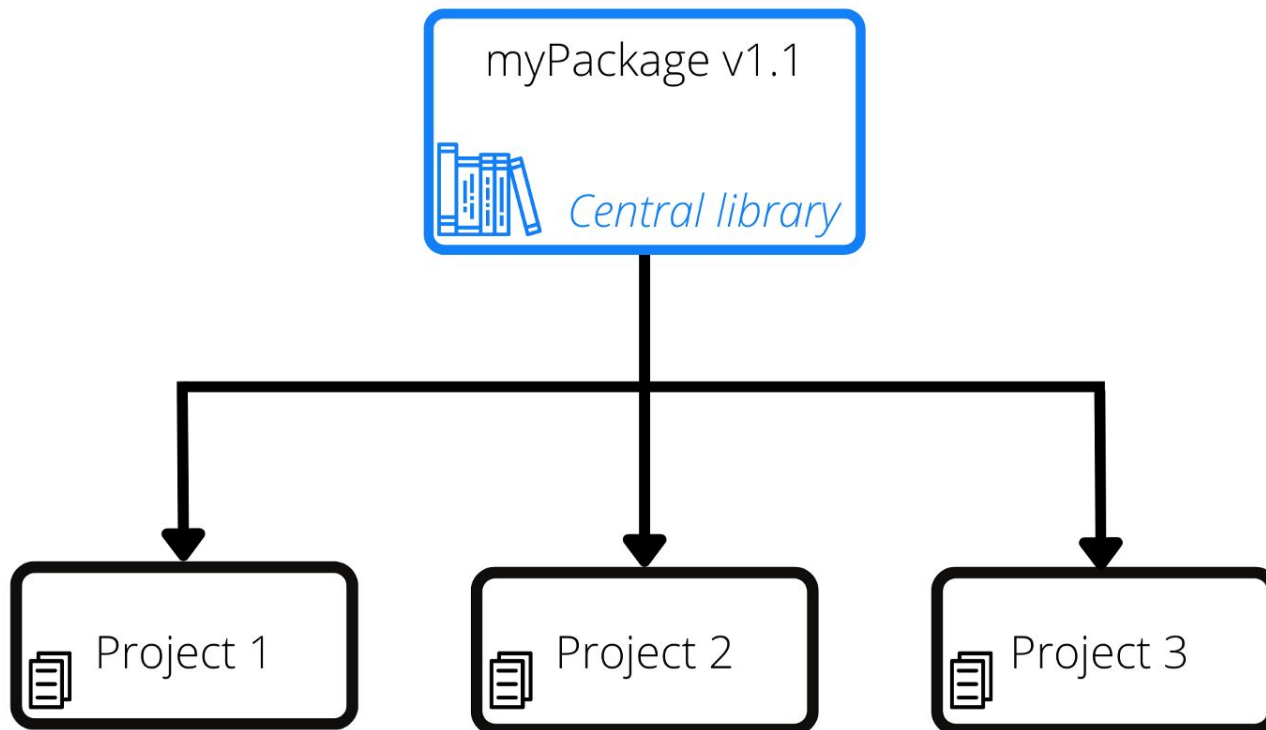
www.osc-ksa.com



batool@liverpool.ac.uk



install.packages()



@OpenSciSaudi, @batool664



[www.osc-ksa.com](http://www.osc-ksa.com)



[batool@liverpool.ac.uk](mailto:batool@liverpool.ac.uk)



myPackage v1.1



*Project library*

Project 1



myPackage v1.3




*Project library*

Project 2




myPackage v0.9

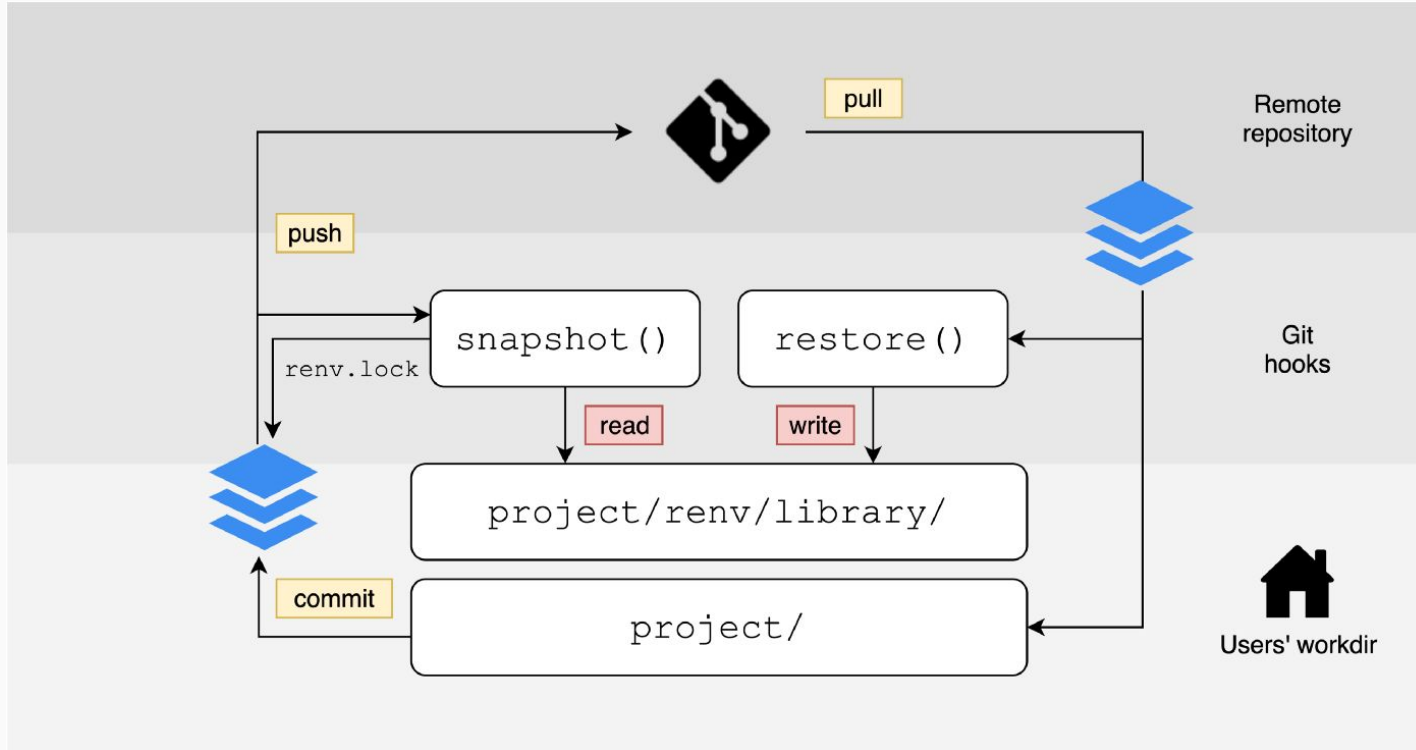


*Project library*

Project 3









دمج البيانات من أكثر من مصدر

**Left Table**

Date	CountryID	Units
1/1/2020	1	40
1/2/2020	1	25
1/3/2020	3	30
1/4/2020	2	35

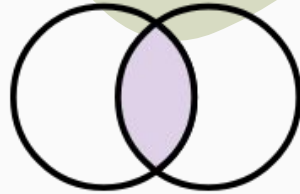
**Right Table**

ID	Country
1	USA
2	Canada
3	Panama
4	Spain

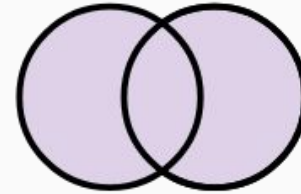
**Merged Table**

Date	CountryID	Units	Country
1/1/2020	1	40	USA
1/2/2020	1	25	USA
1/4/2020	2	35	Canada
1/3/2020	3	30	Panama
<i>null</i>	<i>null</i>	<i>null</i>	Spain

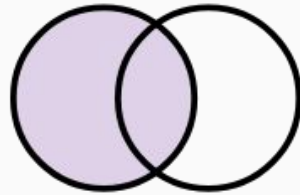




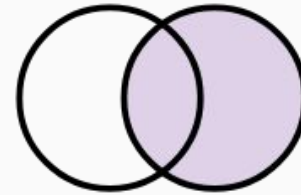
`inner_join(x, y)`



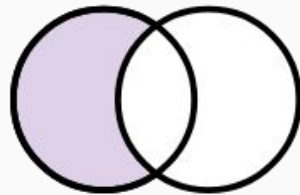
`full_join(x, y)`



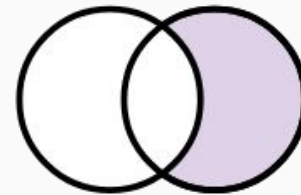
`left_join(x, y)`



`right_join(x, y)`



`anti_join(x, y)`



`anti_join(y, x)`





tabA

key	A1	A2
key1		
key2		
key3		
key4		

tabB

key	B1	B2
key2		
key4		
key6		
key8		



tabC

key	A1	A2	B1	B2
key1			NA	NA
key2				
key3			NA	NA
key4				
key6	NA	NA		
key8	NA	NA		

# Full Join

1	x1	1	y1
2	x2	2	y2
3	x3	4	y4



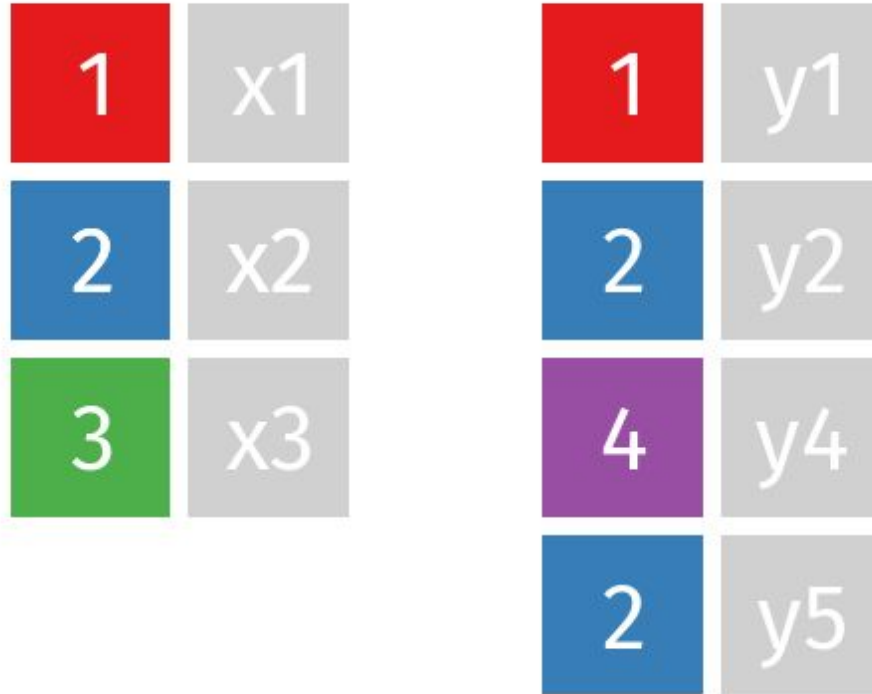


## Inner Join

1	x1	1	y1
2	x2	2	y2
3	x3	4	y4



# Left Join







## Right Join

1	x1	1	y1
2	x2	2	y2
3	x3	4	y4



ID	X1	ID	X2
1	a1	2	b1
2	a2	3	b2

Inner Join

ID	X1	X2
2	a2	b1

Left Join

ID	X1	X2
1	a1	NA
2	a2	b1

Right Join

ID	X1	X2
2	a2	b1
3	NA	b2

Full Join

ID	X1	X2
1	a1	NA
2	a2	b1
3	NA	b2





a	
x1	x2
A	1
B	2
C	3

 + 

b	
x1	x3
A	T
B	F
D	T

 =

### Mutating Joins

x1	x2	x3
A	1	T
B	2	F
C	3	NA

**dplyr::left\_join(a, b, by = "x1")**  
Join matching rows from b to a.

x1	x3	x2
A	T	1
B	F	2
D	T	NA

**dplyr::right\_join(a, b, by = "x1")**  
Join matching rows from a to b.

x1	x2	x3
A	1	T
B	2	F

**dplyr::inner\_join(a, b, by = "x1")**  
Join data. Retain only rows in both sets.

x1	x2	x3
A	1	T
B	2	F
C	3	NA
D	NA	T

**dplyr::full\_join(a, b, by = "x1")**  
Join data. Retain all values, all rows.



country	1999	2000	2001	2002
Angola	800	750	925	1020
India	20100	25650	26800	27255
Mongolia	450	512	510	586

## Pivot data longer

```
data %>%
  pivot_longer(
    cols = 1999:2002,
    names_to = "year",
    values_to = "cases"
  )
```



country	year	cases
Angola	1999	800
Angola	2000	750
Angola	2001	925
Angola	2002	1020
India	1999	20100
India	2000	25650
India	2001	26800
India	2002	27255
Mongolia	1999	450
Mongolia	2000	512
Mongolia	2001	510
Mongolia	2002	586



**names\_from**                      **values\_from**

plot_id	genus	mean_weight
1	Baiomys	7.00
2	Baiomys	6.00
3	Baiomys	8.61
1	Chaetodipus	22.20
2	Chaetodipus	25.11
3	Chaetodipus	24.64
1	Dipodomys	60.23
2	Dipodomys	55.68
3	Dipodomys	52.05

plot_id	Baiomys	Chaetodipus	Dipodomys
1	7.00	22.20	60.23
2	6.00	25.11	55.68
3	8.61	24.64	52.05

`data.frame`

column with new variable names

column of values for new variables

```
surveys_gw %>% pivot_wider(names_from = genus, values_from = mean_weight)
```



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk

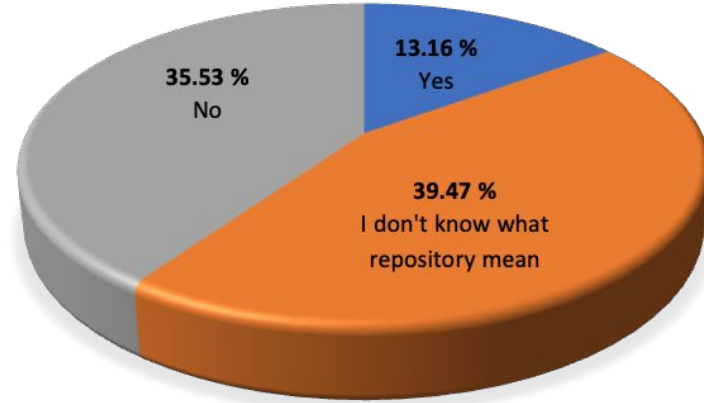


# تطوي حُزم ومكتبات في لغة الآر

# الوصول لبيانات محلية في العالم العربي كانت في الكثير من الأحيان تكتنفها بعض المصاعب



رسم توضيحي بواسطة  
*Ainsley Seago (CC-BY 4.0).*



مسح أجراه مجتمع العلوم المفتوحة المملكة العربية السعودية  
ل 80 فردًا من 2022-2-24 حتى 2022-4-11.



@OpenSciSaudi, @batool664

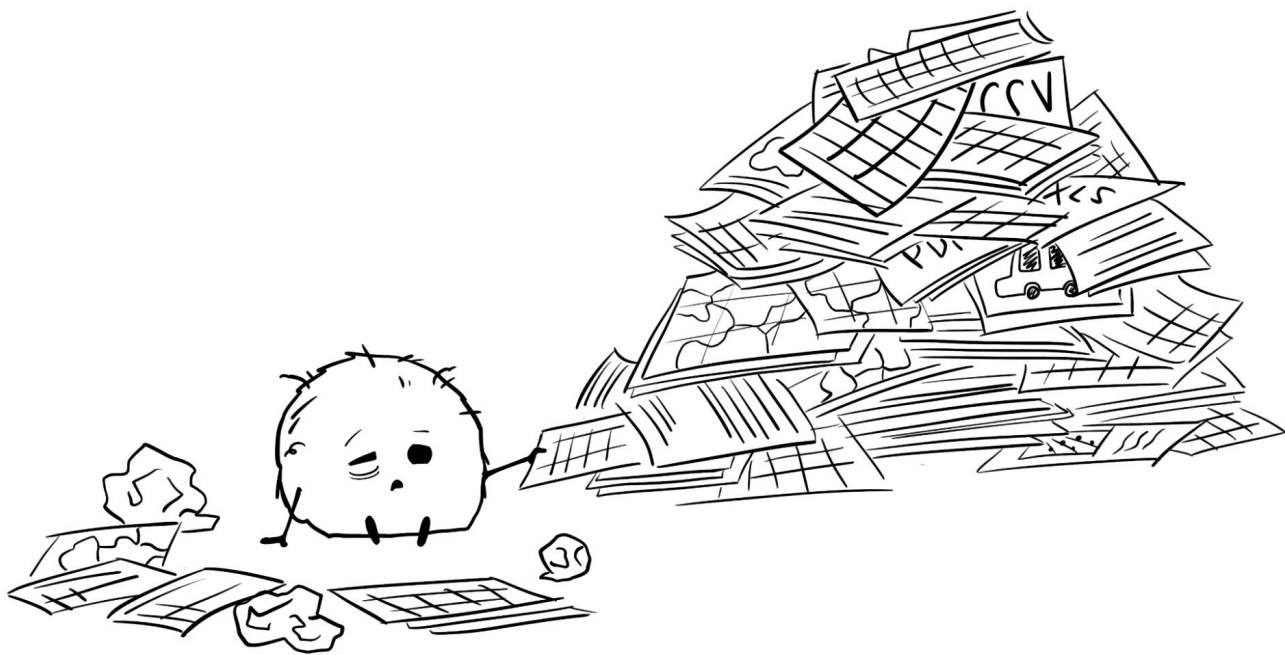


www.osc-ksa.com



batool@liverpool.ac.uk





@OpenSciSaudi, @batool664



[www.osc-ksa.com](http://www.osc-ksa.com)



[batool@liverpool.ac.uk](mailto:batool@liverpool.ac.uk)





# مبادئ FAIR

## قواعد وأساسيات FAIR

Findable (يُمكن إيجاده) ●

Accessible (يُمكن الوصول إليه) ●

Interoperable (يُمكن تشغيله) ●

Reusable (صالح للاستخدام) ●



The Turing Way project illustration by Scriberia. Used under a CC-BY 4.0 licence. DOI: [10.5281/zenodo.3332807](https://doi.org/10.5281/zenodo.3332807)



@OpenSciSaudi, @batool664



[www.osc-ksa.com](http://www.osc-ksa.com)



[batool@liverpool.ac.uk](mailto:batool@liverpool.ac.uk)



# Cite



Published datasets get a DOI that others can use to give researchers credit for their work.

# License



Published datasets are licensed by Creative Commons to make it easier for the data to be re-used in the future.

# Discover



The DOIs ensure that the published data files can always be found, even if URLs change over time.



@OpenSciSaudi, @batool664



[www.osc-ksa.com](http://www.osc-ksa.com)



[batool@liverpool.ac.uk](mailto:batool@liverpool.ac.uk)



- `usethis::create_package()` : creates the file structure for a new package
- `usethis::use_r()` : creates R files
- `devtools::load_all()` : loads all functions in a package like when a package is installed and attached with `library()`
- `usethis::use_package()` : adds a package dependency to the `DESCRIPTION` file
- `usethis::use_data()` : saves an object in the R session as a dataset in the package
- `devtools::document()` : creates documentation files in `man/` and the `NAMESPACE` file from roxygen2 code (it is a wrapper of `roxygen2::roxygenize()`)
- `usethis::use_vignette()` : creates a new vignette in `vignettes/`
- `devtools::check()` : builds and checks a package for any ERRORS, WARNINGS, or NOTES
- `devtools::install()` : uses `R CMD INSTALL` to install a package



# ملفات اساسية في أي حزمة أو مكتبة

BatoolMM add TODO list		
✓ 9d8cc35 on 26 Jul 2021 39 commits		
.github/workflows	try fair-software GHA	17 months ago
R	add documentation of plot_exons	2 years ago
imgs	add BRCA2 img	2 years ago
man	add documentation of plot_exons	2 years ago
.Rbuildignore	added MIT License	2 years ago
.gitignore	add .DS_Store to .gitignore	2 years ago
DESCRIPTION	add stringr pkg	2 years ago
LICENSE	added MIT License	2 years ago
LICENSE.md	added MIT License	2 years ago
NAMESPACE	add documentation of plot_exons	2 years ago
README.md	add TODO list	13 months ago
exonR.Rproj	Initial commit	2 years ago

apreshill and Alison Hill new pkgdown site (#85)		
✓ 821d5ee on 21 Apr 202 202 commits		
.github	update gh actions (#65)	2 years ago
R	Adding year to penguins (#62)	2 years ago
data-raw	Adding year to penguins (#62)	2 years ago
data	Use an internal dataset (#36)	2 years ago
inst	add DOI to citation (#73)	2 years ago
man	new pkgdown site (#85)	4 months ago
pkgdown	new pkgdown site (#85)	4 months ago
vignettes	new pkgdown site (#85)	4 months ago
.Rbuildignore	update rbuildignore (for cran submission) (#50)	2 years ago
.gitignore	Rm docs (#32)	2 years ago
DESCRIPTION	remove Palmer URL in DESCRIPTION	2 years ago
LICENSE.md	update pkg license & description	2 years ago
NAMESPACE	Extdata (#46)	2 years ago
README.Rmd	new pkgdown site (#85)	4 months ago
README.md	new pkgdown site (#85)	4 months ago
_pkgdown.yml	new pkgdown site (#85)	4 months ago
cran-comments.md	remove CODE_OF_CONDUCT from README.md (#57)	2 years ago
palmerpenguins.Rproj	Merge branch 'master' of <a href="https://github.com/allisonhorst/palmerpeng...">https://github.com/allisonhorst/palmerpeng...</a>	2 years ago



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



# ملفات اساسية في أي حزمة أو مكتبة

BatoolMM add TODO list		
✓ 9d8cc35 on 26 Jul 2021 39 commits		
.github/workflows	try fair-software GHA	17 months ago
R	add documentation of plot_exons	2 years ago
imgs	add BRCA2 img	2 years ago
man	add documentation of plot_exons	2 years ago
.Rbuildignore	added MIT License	2 years ago
.gitignore	add .DS_Store to .gitignore	2 years ago
DESCRIPTION	add stringr pkg	2 years ago
LICENSE	added MIT License	2 years ago
LICENSE.md	added MIT License	2 years ago
NAMESPACE	add documentation of plot_exons	2 years ago
README.md	add TODO list	13 months ago
exonR.Rproj	Initial commit	2 years ago

apreshill and Alison Hill new pkgdown site (#85)		
✓ 821d5ee on 21 Apr 202 202 commits		
.github	update gh actions (#65)	2 years ago
R	Adding year to penguins (#62)	2 years ago
data-raw	Adding year to penguins (#62)	2 years ago
data	Use an internal dataset (#36)	2 years ago
inst	add DOI to citation (#73)	2 years ago
man	new pkgdown site (#85)	4 months ago
pkgdown	new pkgdown site (#85)	4 months ago
vignettes	new pkgdown site (#85)	4 months ago
.Rbuildignore	update rbuildignore (for cran submission) (#50)	2 years ago
.gitignore	Rm docs (#32)	2 years ago
DESCRIPTION	remove Palmer URL in DESCRIPTION	2 years ago
LICENSE.md	update pkg license & description	2 years ago
NAMESPACE	Extdata (#46)	2 years ago
README.Rmd	new pkgdown site (#85)	4 months ago
README.md	new pkgdown site (#85)	4 months ago
_pkgdown.yml	new pkgdown site (#85)	4 months ago
cran-comments.md	remove CODE_OF_CONDUCT from README.md (#57)	2 years ago
palmerpenguins.Rproj	Merge branch 'master' of https://github.com/allisonhorst/palmerpeng...	2 years ago



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



# ملفات اساسية في أي حزمة أو مكتبة



BatoolMM add TODO list		
✓ 9d8cc35 on 26 Jul 2021 39 commits		
.github/workflows	try fair-software GHA	17 months ago
R	add documentation of plot_exons	2 years ago
imgs	add BRCA2 img	2 years ago
man	add documentation of plot_exons	2 years ago
.Rbuildignore	added MIT License	2 years ago
.gitignore	add .DS_Store to .gitignore	2 years ago
DESCRIPTION	add stringr pkg	2 years ago
LICENSE	added MIT License	2 years ago
LICENSE.md	added MIT License	2 years ago
NAMESPACE	add documentation of plot_exons	2 years ago
README.md	add TODO list	13 months ago
exonR.Rproj	Initial commit	2 years ago

apreshill and Alison Hill new pkgdown site (#85)		
✓ 821d5ee on 21 Apr 2021 202 commits		
.github	update gh actions (#65)	2 years ago
R	Adding year to penguins (#62)	2 years ago
data-raw	Adding year to penguins (#62)	2 years ago
data	Use an internal dataset (#36)	2 years ago
inst	add DOI to citation (#73)	2 years ago
man	new pkgdown site (#85)	4 months ago
pkgdown	new pkgdown site (#85)	4 months ago
vignettes	new pkgdown site (#85)	4 months ago
.Rbuildignore	update rbuildignore (for cran submission) (#50)	2 years ago
.gitignore	Rm docs (#32)	2 years ago
DESCRIPTION	remove Palmer URL in DESCRIPTION	2 years ago
LICENSE.md	update pkg license & description	2 years ago
NAMESPACE	Extdata (#46)	2 years ago
README.Rmd	new pkgdown site (#85)	4 months ago
README.md	new pkgdown site (#85)	4 months ago
_pkgdown.yml	new pkgdown site (#85)	4 months ago
cran-comments.md	remove CODE_OF_CONDUCT from README.md (#57)	2 years ago
palmerpenguins.Rproj	Merge branch 'master' of https://github.com/allisonhorst/palmerpeng...	2 years ago



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



# ملفات اساسية في أي حزمة أو مكتبة



BatoolMM add TODO list		
✓ 9d8cc35 on 26 Jul 2021 39 commits		
.github/workflows	try fair-software GHA	17 months ago
R	add documentation of plot_exons	2 years ago
imgs	add BRCA2 img	2 years ago
man	add documentation of plot_exons	2 years ago
.Rbuildignore	added MIT License	2 years ago
.gitignore	add .DS_Store to .gitignore	2 years ago
DESCRIPTION	add stringr pkg	2 years ago
LICENSE	added MIT License	2 years ago
LICENSE.md	added MIT License	2 years ago
NAMESPACE	add documentation of plot_exons	2 years ago
README.md	add TODO list	13 months ago
exonR.Rproj	Initial commit	2 years ago

apreshill and Alison Hill new pkgdown site (#85)		
✓ 821d5ee on 21 Apr 202 202 commits		
.github	update gh actions (#65)	2 years ago
R	Adding year to penguins (#62)	2 years ago
data-raw	Adding year to penguins (#62)	2 years ago
data	Use an internal dataset (#36)	2 years ago
inst	add DOI to citation (#73)	2 years ago
man	new pkgdown site (#85)	4 months ago
pkgdown	new pkgdown site (#85)	4 months ago
vignettes	new pkgdown site (#85)	4 months ago
.Rbuildignore	update rbuildignore (for cran submission) (#50)	2 years ago
.gitignore	Rm docs (#32)	2 years ago
DESCRIPTION	remove Palmer URL in DESCRIPTION	2 years ago
LICENSE.md	update pkg license & description	2 years ago
NAMESPACE	Extdata (#46)	2 years ago
README.Rmd	new pkgdown site (#85)	4 months ago
README.md	new pkgdown site (#85)	4 months ago
_pkgdown.yml	new pkgdown site (#85)	4 months ago
cran-comments.md	remove CODE_OF_CONDUCT from README.md (#57)	2 years ago
palmerpenguins.Rproj	Merge branch 'master' of https://github.com/allisonhorst/palmerpeng...	2 years ago



@OpenSciSaudi, @batool664



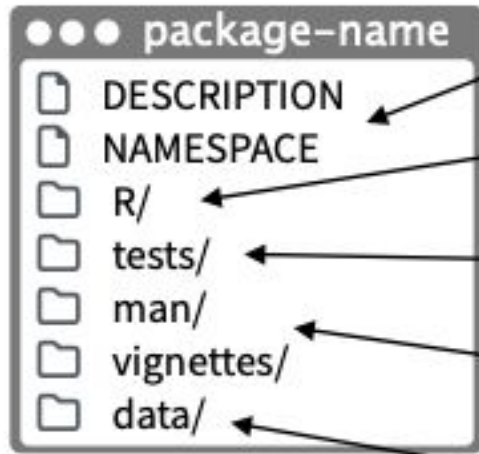
www.osc-ksa.com



batool@liverpool.ac.uk



# ملفات اساسية في أي حزمة أو مكتبة



Set up metadata and organize package functions

Write R code for your package

Verify your code is correct

Document your code and write tutorials and how-tos

Include datasets in your package

**raw\_data**

Only dataset package



@OpenSciSaudi, @batool664



www.osc-ksa.com

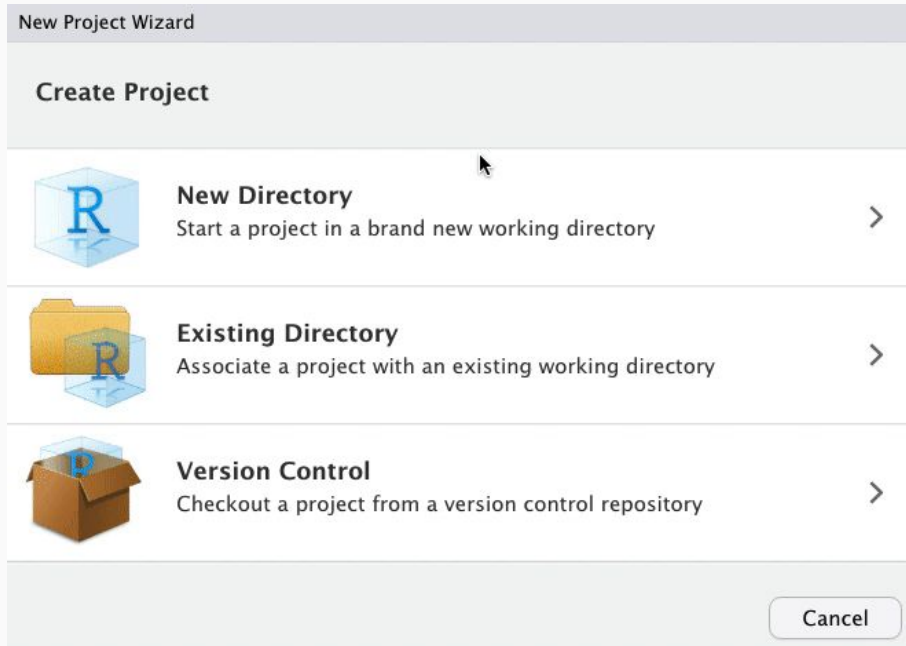


batool@liverpool.ac.uk





# الخطوة الأولى



أو

```
usethis::create_package()
```



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



## الخطوة الثانية

---

نقل الريبوزتري إلى جيت هوب

```
usethis::use_github()
```



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



## الخطوة الثالثة



Credits: [Rstudio4edu](#) by [Desirée De Leon](#) and [Alison Hil](#)

- أختيار البيانات المناسبة وحفظها في data-raw
- البيانات المستخدمة في هذا المثال تم اقتباسها من بوابة قطر للبيانات المفتوحة.



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



## الخطوة الثالثة

---

```
## code to prepare `DATASET` dataset goes here
```

```
library(tidyverse)  
library(here)  
library(janitor)
```

```
schoolData <- read_delim(here("data-raw","qatar-school-results.csv"),  
                        delim = ";") %>%  
  clean_names() %>%  
  select(year, pass_fail, level, grade, gender)
```

```
usethis::use_data(schoolData, overwrite = TRUE)
```

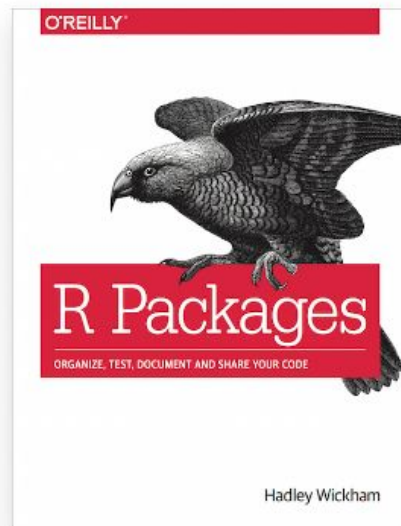


# R Packages (2e)

## Welcome!

Welcome to R packages by [Hadley Wickham](#) and [Jenny Bryan](#). Packages are the fundamental units of reproducible R code. They include reusable R functions, the documentation that describes how to use them, and sample data. In this book you'll learn how to turn your code into packages that others can easily download and use. Writing a package can seem overwhelming at first. So start with the basics and improve it over time. It doesn't matter if your first version isn't perfect as long as the next version is better.

This is the work-in-progress 2nd edition of the book.



أقرأه مجاني



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



# المصادر المستخدمة

- Building R package by Paula Morega
- Package Building by Tom Mock
- Rstudio4edu by *Desirée De Leon* and *Alison Hill*



@OpenSciSaudi, @batool664



www.osc-ksa.com



batool@liverpool.ac.uk



## الواجب

- كتابة مقالة في موضوع تعلمته في لغة الآر
  - كتابة بالعربي أو الأنجلش
  - أمثلة هي باكيج جديدة أو عن رحلتك في التعلم أو عن الجيت هوب أو ...
  - أنشره في **R Weekly** وتويتر
- مشاهدة
- <https://www.youtube.com/watch?v=AADnslLpzI4>



# Feedback



- ما هو **أفضل** شيء تعلمته اليوم؟
- ما هو **أصعب** مفهوم تعرضت له في هذه الجلسة؟
- ما هو الشيء الذي تحب ان **يتحسن** في الجلسات القادمة؟

