



THE
CARPENTRIES

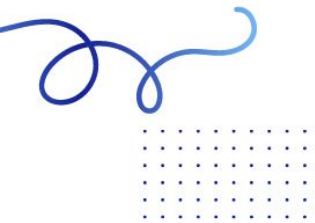
مدخل في لغة الآر (R) والعلوم المفتوحة لعلماء المعلوماتية الحيوية

Batool Almarzouq
Monah Abou Alezz
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Mona Alsharif



Open Science Community Saudi Arabia
مجتمع العلوم المفتوحة في المملكة العربية السعودية





Day ٣

اليوم الثالث



@OpenSciSaudi



<https://github.com/Open-Science-Community-Saudi-Arabia>



<https://osc-ksa.com/>





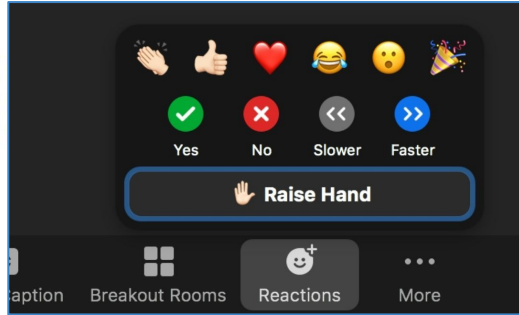
قواعد الدورة

كتابة الاسم في Etherpad

إطفاء الجوال

القواعد السلوكية

لا تتردد في طرح **أي سؤال** خلال الجلسة
الإجابة على التمارين خلال الدورة



Welcome to the Intro to R and Open Science Practices for Biologists .Workshop!

This is a 3-days hands-on workshops organised by Open Science Community Saudi Arabia (OSCSA) to sFDA staff.

The workshop will introduce data wrangling and visualisation with Tidyverse and ggplot2 and how to use packages from Bioconductor to analyse biological data. It'll also introduce you to best practices in open science and Reproducibility using git and GitHub.

Date: 31st of October - 2nd of November (11:00 am - 2:00pm Riyadh time).

Workshop Website: <https://open-science-community-saudi-arabia.github.io/sFDA-Carrentries-Workshop/>
Workshop GitHub: <https://github.com/Open-Science-Community-Saudi-Arabia/sFDA-Carrentries-Workshop>

Zoom Call:

<https://liverpool-ac-uk.zoom.us/j/92080791938?pwd=H2IjWDdmVnRlUjBwbnFVYkYvOFNNK090dzt0>


Meeting ID: 920 8079 1938
Passcode: +9qWwS**



صديقك في R



لا يستخدم في تسمية المتغيرات علامات المساواة =
بل تستخدم علامة <-

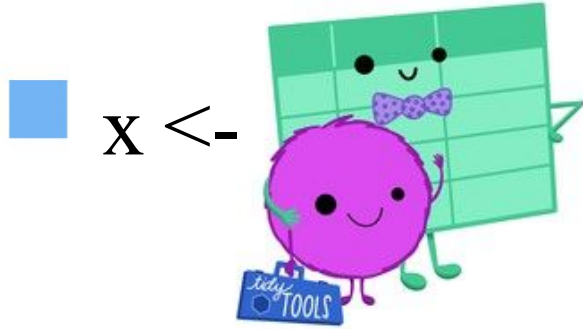


```
x <- 1
```

x هو نفسه الرقم 1



صديقك في R



Credit: Allison Horst

$x <- 1$

x هو نفسه الرقم 1



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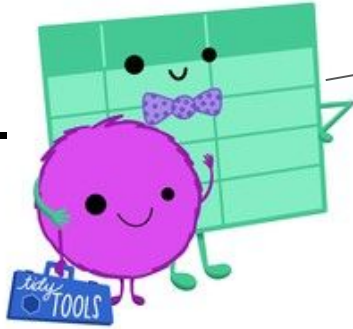
<https://osc-ksa.com/>



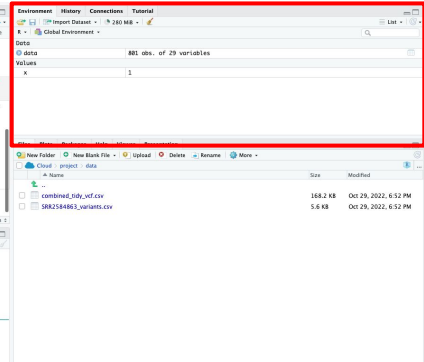
صديقك في R



$X <-$



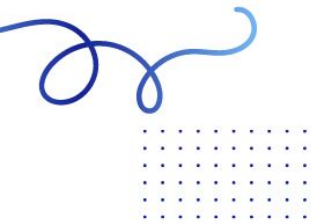
```
combined_tidy_vcf.csv | 582154663_variables.csv | Report Rmd  
Source: Visual  
23 - ## Including Plots  
24  
25 You can also embed plots, for example:  
26  
27 <[r pressure, echo=FALSE]>  
28 data = [read.csv("data/combined_tidy_vcf.csv")]  
29  
---  
Rows: 801 Columns: 29 - Column specification  
-----  
Delimiter: ","  
chr (7): sample_id, CHROM, REF, ALT, BP4, Indiv, gt, GT_allSites  
dbl (14): POS, QUAL, IDV, IMP, DP, VDB, RPL, RPI, MQ38, MQ38_SIB, MQ38_AC, AN, MQ, gt_CT  
num (2): GC2E  
lgl (3): ID_FILTER, INDEL, ICE, HSB  
+ Use 'show_col()' to retrieve the full column specification for this data.  
+ Specify the column types or set 'show_col_types = FALSE' to quiet this message.  
---  
30  
31 Note that the 'echo = FALSE' parameter is added to the code chunk to prevent printing of the R code that generated the plot.  
32  
33 @ Cloud > pressure  
Console Terminal Background jobs  
@ R 4.2.1 - /rmd/project/...  
[1] "data/combined_tidy_vcf.csv"  
> read.csv("data/combined_tidy_vcf.csv")  
Session restored from your saved work on 2022-10-31 19:38:18 UTC (1 day ago)  
> set.seed(123456789) # reproducible  
> library(tidyverse)  
>  
> X <- 1  
> data <- read.csv("data/combined_tidy_vcf.csv")  
Rows: 801 Columns: 29 - Column specification  
-----  
Delimiter: ","  
chr (7): sample_id, CHROM, REF, ALT, BP4, Indiv, gt, GT_allSites  
dbl (14): POS, QUAL, IDV, IMP, DP, VDB, RPL, RPI, MQ38, MQ38_SIB, MQ38_AC, AN, MQ, gt_CT  
num (2): GC2E  
lgl (3): ID_FILTER, INDEL, ICE, HSB
```



Credit: Allison Horst

$X <- 1$

X هو نفسه الرقم 1



الحاويات والمتغيرات



global environment تفقد ★

حذف الحاويات ★



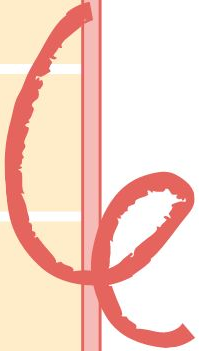
الجملة الفعلية في اللغة العربية تتكون
من فعل وفاعل



الجملة الفعلية في اللغة العربية تتكون
من فعل وفاعل



الجملة الفعلية في لغة الآر R تتكون:



الجملة الفعلية في اللغة العربية تتكون
من فعل وفاعل



الجملة الفعلية في لغة الآر R تتكون:

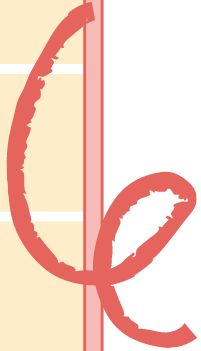
`function(arg, arg)`

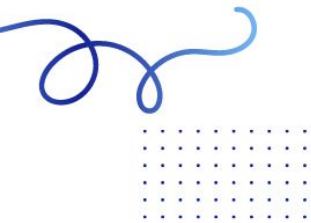


الجملة الفعلية في اللغة العربية تتكون
من فعل وفاعل

الجملة الفعلية في لغة الآر R تتكون:

`plot(data)`





كيفية قراءة البيانات في R



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

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



البشر تتكلم بالحروف والأرقام لكن كيف **تتكلم** لغة R؟

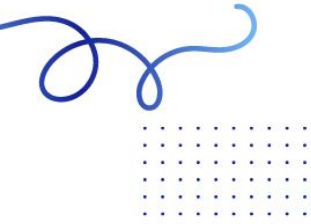
تصنف لغة R أي معلومة إلى أحد هذه الأنواع:

النوع	التعريف	مثال
numerical	رقم متواصل كالطول	12.5
integer	رقم غير متواصل كالأعمار	23
string	كلمات كأسماء	إيمان، بسمّة
factor	أصناف أو فئات أو طبقات كأنواع الأزهار	توليب
logical	هل هي خاطئة أم صائبة	TRUE/FALSE





Packages



**Using Base R for your analysis
and copy pasting your results
into tables in Word**



**learning how to use dplyr
visualize data with ggplot2
and report your analysis in
rmarkdown documents**



wielding the entire might of the tidyverse



Lextale

DOI: [10.5281/zenodo.7134368](https://doi.org/10.5281/zenodo.7134368)

The main goal of [Lextale package](#) is to mark and calculate the %correctAV scoring for the English, German and Dutch [LexTALE-test](#) if administered using implementations that do not end with participants' score on the screen, e.g. online surveys. For more info about the test, see [Lemhöfer & Broersma, 2012](#).



Functions and Arguments

```
lex(dataframe)
```

This function mark and calculates the lextale score for the English and German versions of the test. The argument takes a dataframe which must include two variables(columns):

- ID: each ID must have 60 entries, e.g. ID 1987 repeated 60 times, with 40 IDs per time (=2400 rows).
- answer: a variable of 0/1, with 2400 rows.

Running this function exports/saves a file named 'lex.scores.csv' to your directory. *Please note both columns names are case-sensitive. Using this function returns the scores of 40 participants in one lex-click! Future work will be on accepting and open number of scores, and on accepting Yes/No in the argument.*

```
lex.dutch(dataframe)
```

This function mark and calculates the lextale score for the Dutch version of the test. `lex.dutch()` function takes a



Ghozayel Elotteebi

Ghozayel

Follow

A senior PhD student @university of Nottingham, UK, interested in R and PsychoPy.

👤 1 follower · 11 following

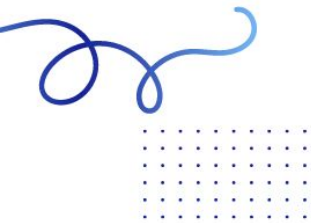
📍 University of Nottingham | Jubail University College

📍 Nottingham, UK | Asharqiah, KSA

🔗 <https://gitlab.pavlovia.org/gzyl>

🐦 @gzl_atb





GitHub



By: Saniya Khullar



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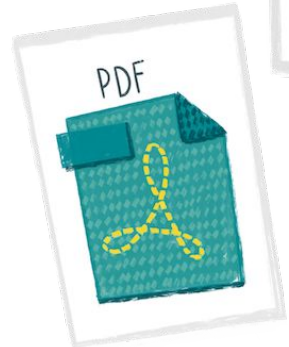
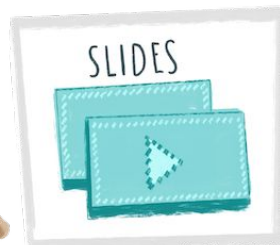
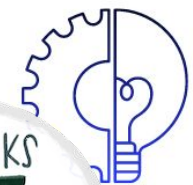


<https://github.com/Open-Science-Community-Saudi-Arabia>



<https://osc-ksa.com/>





Credit: Allison Horst



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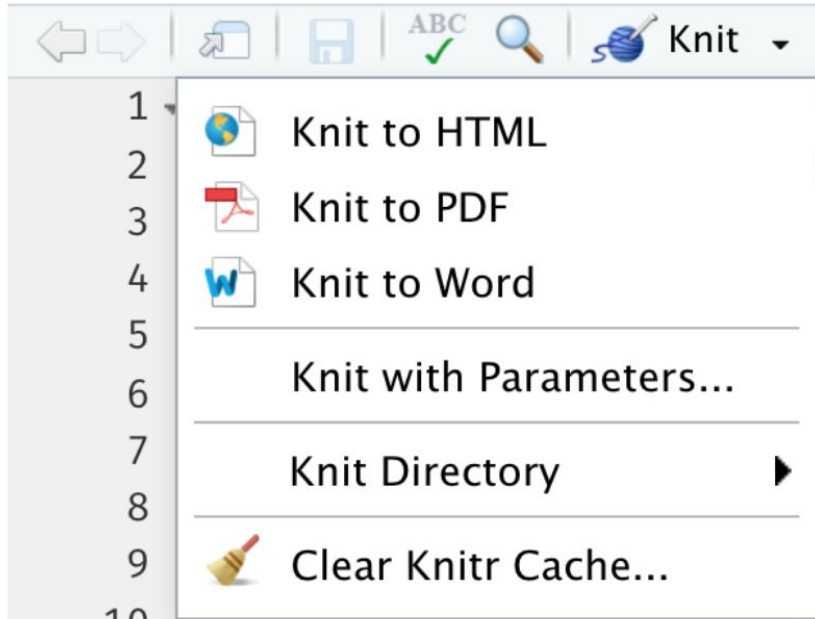


<https://osc-ksa.com/>





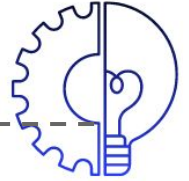
Knit to ...



```
---  
author: Your name here  
title: Your title here  
output:  
  html_document:  
    toc: true  
    toc_float: true  
    theme: flatly  
    code_folding: hide  
    code_download: true  
  word_document: default  
  pdf_document: default  
---
```



What is YAML header?



YAML, pronounced "Yeah-mul" stands for "YAML Ain't Markup Language". YAML is a human-readable data-serialization language which, as its name suggests, is not a markup language.

```
---  
title: "Untitled"  
author: "Carpenter"  
date: "1/7/2022"  
output: html_document  
---
```

```
{r_setup, include=FALSE}
```



What is YAML header?



You can use a variety of languages to format text and images in R Markdown

- HTML
- LaTeX
- CSS

```
output: html_document
---
```

```
{r_setup, include=FALSE}
knitr::opts_chunk$set(echo = TRUE)
```

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
{r_cars}
summary(cars)
```

Including Plots

You can also embed plots, for example:

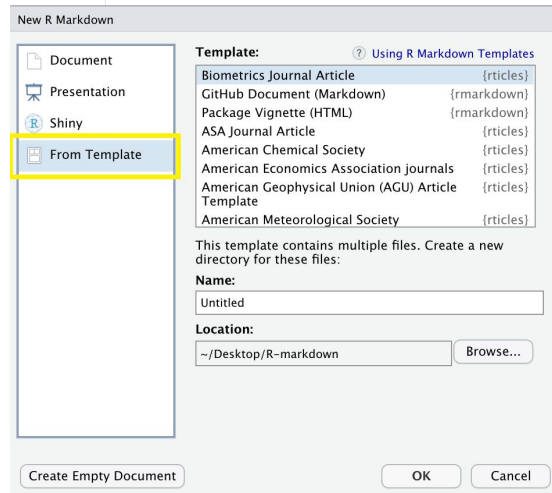
```
{r_pressure, echo=FALSE}
plot(pressure)
```



Finding Existing Templates?



On RStudio, load the `rticles` package by using the function `library(rticles)` (remember we've already installed the package earlier!). Once you've loaded the package, use the plus icon at the upper-left side of your screen to create a new document or proceed **with File > New File > R Markdown**



Type of Outputs from R Markdown



Authoring Books with R Markdown

- Preface
 - Why read this book
 - Structure of the book
 - Software information and conventions
 - Acknowledgments
- About the Author
- 1 Introduction
 - 1.1 Motivation
 - 1.2 Get started
 - 1.3 Usage
 - 1.4 Two rendering approaches
 - 1.5 Some tips
- 2 Components
 - 2.1 Markdown syntax
 - 2.1.1 Inline formatting
 - 2.1.2 Block-level elements
 - 2.1.3 Math expressions
 - 2.2 Markdown extensions by book...

2.4 Figures

By default, figures have no captions in the output generated by **knitr**, which means they will be placed wherever they were generated in the R code. Below is such an example.

```
par(mar = c(4, 4, 0.1, 0.1))  
plot(pressure, pch = 19, type = "b")
```

Temperature	Pressure
0	0
50	0
100	0
150	0
200	10
250	100
300	300
350	800

<https://bookdown.org/yihui/bookdown/>



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Type of Outputs from R Markdown



Distill Website



Make Your Computational Analysis Citable

This post introduces the steps needed by academic and non-academics to make their computational analysis in R citable.

AUTHOR	AFFILIATION
Batool Almarzouq	King Abdullah International Medical Research Center (KAIMRC)
PUBLISHED	CITATION
March 18, 2021	Almarzouq, 2021

Contents

Why make our computational analysis citable?

What is a DOI?

How can we create DOI for our R code?

- 1- Create a license

Although there are overwhelming resources about licensing and citation for R software packages, there's less attention paid to making non-package (data science) code in R citable. Academics and researchers who want to embrace Open Science practices are mostly unaware of how to make their R code citable before publishing in academic journals and what kind of license they may use to protect the intellectual property of their work.

<https://batool-blabber.netlify.app/>



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<https://github.com/Open-Science-Community-Saudi-Arabia>



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Type of Outputs from R Markdown



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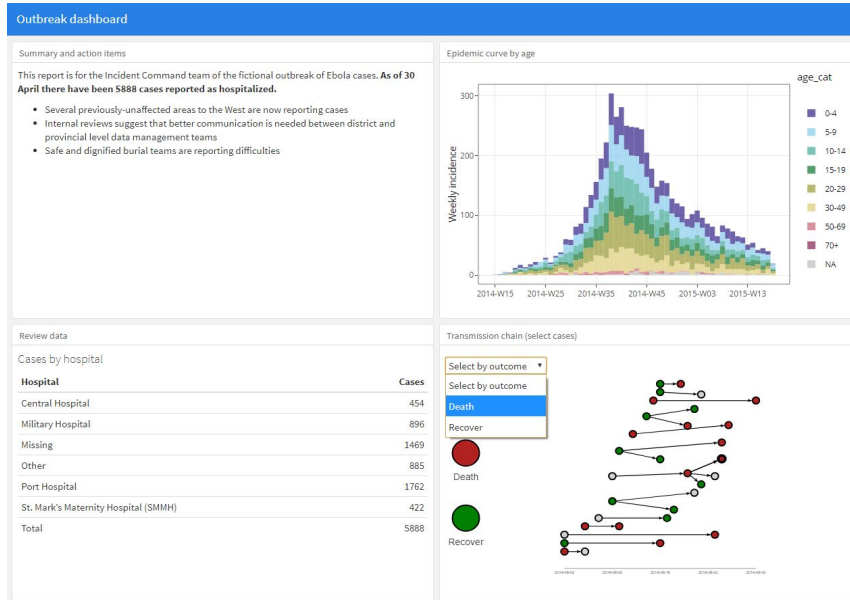
<https://osc-ksa.com/>



Type of Outputs from R Markdown



Flexdashboard



<https://pkgs.rstudio.com/flexdashboard>



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<https://github.com/Open-Science-Community-Saudi-Arabia>



<https://osc-ksa.com/>





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<https://osc-ksa.com/>

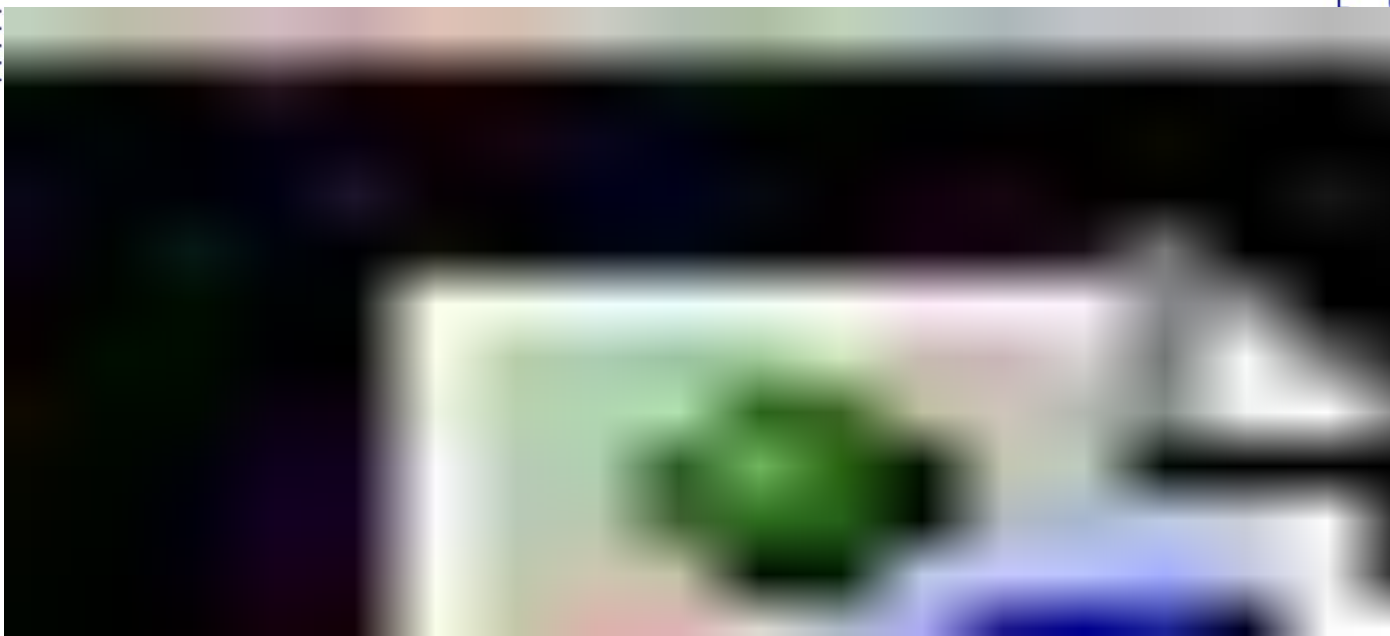


معنى هذا الرمز في لغة R

(و تُم) = %>%

dataset %>%

select(**column**)



@OpenSciSaudi

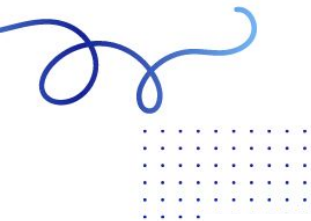


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<https://osc-ksa.com/>





- `filter()` : pick observations by their values

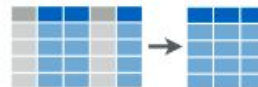


- `select()` : pick variables by their names

Subset Observations (Rows)



Subset Variables (Columns)





- `mutate()` : create new variables with functions of existing variables

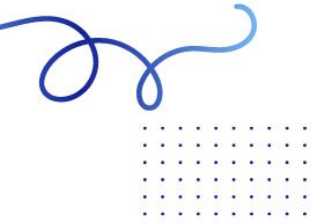
Make New Variables



- `summarise()` : collapse many values down to a single summary

Summarise Data





ggplot2: Build a data MASTERPIECE



Credit: Allison Horst



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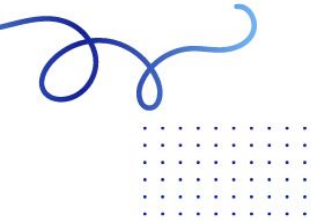


<https://github.com/Open-Science-Community-Saudi-Arabia>



<https://osc-ksa.com/>





Cutting corners to meet arbitrary management deadlines



Essential

Copying and Pasting from Stack Overflow

O'REILLY*

The Practical Developer
@ThePracticalDev

The internet will make those bad words go away



Essential

Googling the Error Message

O RLY?

The Practical Developer
@ThePracticalDev

You're a 10x hacker and it must be someone else's fault.



Blaming the User

Pocket Reference

O RLY?

@ThePracticalDev



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<https://osc-ksa.com/>





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TEAMS

Stack Overflow for Teams - Start collaborating and sharing organizational knowledge.

22,739,212 questions

Ask Question

Newest Active Bountied 348 Unanswered More Filter

0 votes **Moq.Dapper when setting up QueryAsync nothing is mocked**

0 answers
2 views

I am currently trying to write unit tests for my application using moq.dapper. Whenever I go to mock a dynamic type however nothing is returned. Below is my code var expectedQuestions = new List() [...]

c# .net moq dapper WilliamOrr 1 asked 1 min ago

0 votes **how to use svg in flutter?**

0 answers
2 views

After a lot of time and effort searching for the best way to interact with images in flutter I found this article on medium website but I didn't understand it - I think it's complicated for a beginner ...

flutter dart svg devlop 87 asked 1 min ago

0 votes **Cant get border to extend HTML Outlook**

0 answers
2 views

I am trying to create a certificate in an html email. I cannot get the border to extend to the right alignment. Below is my code and an image of it. I know that html in outlook doesnt behave the same ...

html outlook certificate border Tara 15 asked 1 min ago

The Overflow Blog

- GitHub Copilot is here. But what's the price? (Ep. 457)
- Skilling up to architect: What you need to land high-paying IT roles

Featured on Meta

- Testing new traffic management tool
- Duplicated votes are being cleaned up
- Trending: A new answer sorting option
- Ask Wizard Test Results and Next Steps
- Should we burninate the [hyphen] tag?
- Updated button styling for vote answers: currently in A/B testing

Collectives see all

Google Cloud



Blog Your Educational Journey!

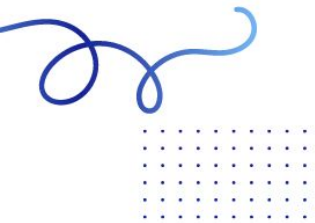


 **OSCSA**
Open Science Community Saudi Arabia
مجتمع العلوم المفتوحة في المملكة العربية السعودية



Create Your Blog in R





A huge thank YOU



**Mona
Al-Sharif**



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<https://github.com/Open-Science-Community-Saudi-Arabia>



<https://osc-ksa.com/>





Feedback



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