

# Introduction



R est un [langage de programmation](#) et un [logiciel libre](#) destiné aux [statistiques](#) et à la [science des données](#).

R is a free software environment for statistical computing and graphics.

# Introduction



R est devenu très populaire au fil du temps grâce à 2 ou 3 caractéristiques :

La communauté des utilisateurs est très active et partage les expériences

C'est un logiciel libre et gratuit

C'est un bon logiciel de statistique


C'est devenu un très bon outil de visualisation des données (graphiques)

Il est aujourd'hui incontournable mais comme tout logiciel (notamment de programmation) il y a un coût d'entrée : une connaissance minimale qui permet d'être suffisamment à l'aise pour se l'approprier.

# Introduction



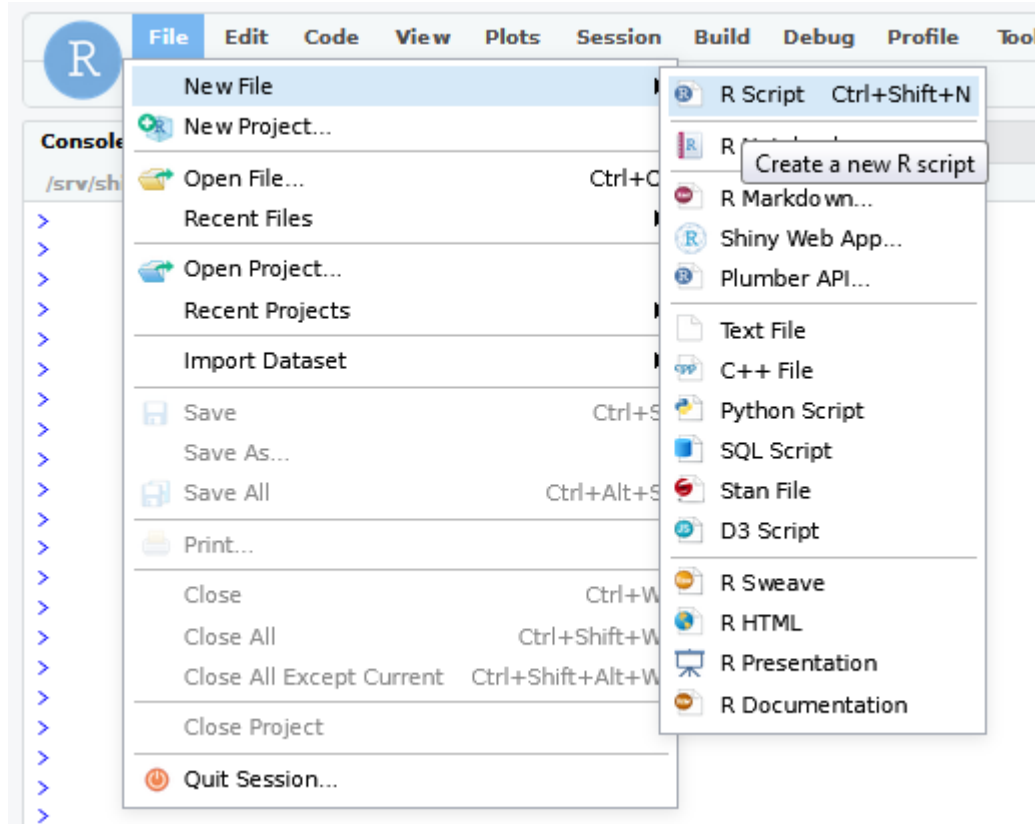
Pour utiliser , il y a plusieurs interfaces, nous allons utiliser Rstudio

To use  several interface are available and we will use Rstudio

<https://rstudio.com/>



# Introduction



# Introduction



The screenshot shows the R Studio interface with the following components and callouts:

- Source Editor:** A blue box labeled "Ecrire ce que je vais faire : le script" is overlaid on the main script editor area.
- Environment Panel:** A blue box labeled "Liste des objets en mémoire" is overlaid on the Environment panel, which currently shows "Global Environment".
- Files Panel:** A blue box labeled "Gestionnaire de fichier" is overlaid on the Files panel, which displays a file explorer view of the project directory.
- Console:** A blue box labeled "Exécution du script" is overlaid on the Console area, which shows the execution path: `/srv/shiny-server/discardless_app/app11/`.

Name	Size	Modified
..		
Rhistory	26.8 KB	Mar 10, 2020, 11:41 PM
app.R	6.6 KB	Mar 10, 2020, 11:41 PM
app_Fonctionne.R	6.1 KB	Apr 2, 2019, 11:20 AM
bd_marquage_SMAC.csv	324.8 KB	Dec 7, 2020, 8:37 AM
bd_marquage_SMAC.xlsx	167.8 KB	Mar 11, 2020, 9:29 AM
div.RDS	5.7 KB	Mar 10, 2020, 11:41 PM
logoSMAC2.png	87.8 KB	Mar 10, 2020, 11:41 PM
Sauvegarde		
server.R	28.7 KB	Dec 7, 2020, 8:52 AM
server_fonctionne.R	20.9 KB	Mar 10, 2020, 11:41 PM
shape		
ui.R	5.2 KB	Mar 12, 2020, 11:14 PM
ui_Fonctionne.R	2.7 KB	Mar 10, 2020, 11:41 PM



# Introduction



The screenshot shows the RStudio interface with the following components:

- Code Editor:** Contains the R code:

```
data<-data.frame(  
  annee=c(2010,2011,2012,2013,2014),  
  catches=c(20,50,60,70,70)  
)
```
- Environment Panel:** Shows "Global Environment" with the message "Environment is empty".
- Files Panel:** Shows a file explorer view of a directory containing various files and folders, including "Rhistory", "app.R", "app\_Fonctionne.R", "bd\_marquage\_SMAC.csv", "bd\_marquage\_SMAC.xlsx", "div.RDS", "logoSMAC2.png", "Sauvegarde", "server.R", "server\_fonctionne.R", "shape", "ui.R", and "ui\_Fonctionne.R".
- Console:** Shows the execution path: "/srv/shi".

A blue text box is overlaid on the code editor, containing the following text:

La fonction data.frame crée un tableau avec 2 colonnes et chaque colonne contient un vecteur de valeur (c() est un vecteur)



# Introduction



Je sélectionne ma fonction et je l'exécute  
→ Run

```
data<-data.frame(annee=c(2010,2011,2012,2013,2014)  
catches=c(20,50,60,70,70))
```

Environment is empty

Name	Size	Modified
..		
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# Introduction



The screenshot shows the RStudio interface with the following elements:

- Code Editor:** Contains R code: `data<-data.frame(annee=c(2010,2011,2012,2013,2014), catches=c(20,50,60,70,70))`. A blue box highlights the code, and a 'Run' button is visible.
- Environment Pane:** Shows 'Global Environment' with a 'data' object containing '5 obs. of 2 variables'. A blue circle with the number '2' is next to it.
- Files Pane:** Shows a file explorer view of a directory containing various files like 'Rhistory', 'app.R', 'app\_Fonctionne.R', etc.
- Terminal/Console:** Shows the output of the code execution: `> data<-data.frame(annee=c(2010,2011,2012,2013,2014), catches=c(20,50,60,70,70))`. A blue circle with the number '1' is next to it.
- Instructional Overlay:** A blue box with white text says 'Je sélectionne ma fonction et je l'exécute → Run' with a 'Run' button below it.





# Introduction



The screenshot shows the RStudio interface with the following elements:

- Code Editor:** Contains the R code:

```
1 data<-data.frame(annee=c(2010,2011,2012,2013,2014),
2 catches=c(20,50,60,70,70))
3
4
5 head
6
7
8
9
10
11
```
- Environment Pane:** Shows the 'data' object with 5 observations and 2 variables. A blue circle with the number '2' is overlaid on this pane.
- Help Pane:** A tooltip for the 'head' function is displayed, explaining its usage: 'Returns the first or last parts of a vector, matrix, table, data frame or function. Since head() and tail() are generic functions, they may also have been extended to other classes. Press F1 for additional help.'
- Files Pane:** Shows a file explorer view of the project directory.
- Run Button:** A blue box with a 'Run' button and a green arrow is overlaid on the code editor, with a blue circle containing the number '1' next to it.
- Code Execution:** Below the code editor, the executed code is shown:

```
> data<-data.frame(annee=c(2010,2011,2012,2013,2014),
+ catches=c(20,50,60,70,70))
> |
```

Un autre intérêt de Rstudio → la complétion de caractère



# Introduction



The screenshot shows the RStudio interface with the following components:

- Code Editor:** Contains the following R code:

```
1 data<-data.frame(annee=c(2010,2011,2012,2013,2014),
2 catches=c(20,50,60,70,70))
3
4
5 head(data)
6
```
- Environment Pane:** Shows the 'Global Environment' with a variable 'data' containing '5 obs. of 2 variables'. A blue circle with the number '2' is overlaid on this pane.
- Files Pane:** Shows a file explorer view of the project directory, listing files such as 'Rhistory', 'app.R', 'app\_Fonctionne.R', 'bd\_marquage\_SMAC.csv', 'bd\_marquage\_SMAC.xlsx', 'div.RDS', 'logoSMAC2.png', 'Sauvegarde', 'server.R', 'server\_fonctionne.R', 'shape', 'ui.R', and 'ui\_Fonctionne.R'.
- Console:** Shows the output of the code execution, with a blue circle with the number '1' overlaid on the first line. The output is:

```
> data<-data.frame(annee=c(2010,2011,2012,2013,2014),
+ catches=c(20,50,60,70,70))
>
> head(data)
  annee catches
1  2010     20
2  2011     50
3  2012     60
4  2013     70
5  2014     70
```
- Buttons:** A 'Run' button is visible in the code editor area.



# Introduction



The screenshot shows the RStudio environment with a script editor on the left and a plot window on the right. The script editor contains the following code:

```
1 data<-data.frame(annee=c(2010,2011,2012,2013,2014),
2 catches=c(20,50,60,70,70))
3
4
5 head(data)
6
7 library(ggplot2)
8
9 ggplot(data)+geom_line(aes(x=annee,y=catches))
10
```

A blue callout box highlights the following text:

library() permet de charger de nouvelles fonctionnalités, des extensions  
ggplot2 est une extension pour faire de « beau graphiques »

The console window shows the execution of the code, resulting in the following output:

```
> data<-data.frame(annee=c(2010,2011,2012,2013,2014),
+ catches=c(20,50,60,70,70))
>
> head(data)
  annee catches
1  2010      20
2  2011      50
3  2012      60
4  2013      70
5  2014      70
```

The plot window displays a line graph with 'annee' on the x-axis and 'catches' on the y-axis. The data points are (2010, 20), (2011, 50), (2012, 60), (2013, 70), and (2014, 70). A blue arrow points from the 'Run' button in the script editor to the plot window.



# Introduction



The screenshot shows the RStudio interface. The console at the bottom left displays the following data:

>	2	2011	50
>	3	2012	60
>	4	2013	70
>	5	2014	70

The plot window on the right shows a line graph with 'annee' on the x-axis (2010 to 2014) and a y-axis with a value of 20. The line starts at 20 in 2010, rises to 50 in 2011, 60 in 2012, and remains at 70 for 2013 and 2014.

Pour utiliser la fonction `library(ggplot2)`, il faut au préalable que la librairie ait été installée (téléchargé et installé). Pour cela il existe 2 sources pour aller chercher des extensions : le CRAN ou un outil de mise à disposition de code comme github.

Le CRAN est la librairie officielle où sont disponible les packages/extensions validées. Github est un outil à la mode qui a moins de contrôle quand à la bonne marche des packages. C'est utile quand on a des packages en developpement.

# Introduction



12  
13 `install.packages("ggplot2")`

Environment History Connections Build Git Tutorial  
Global Environment  
Data  
data 5 obs. of 2 variables

Files Plots Packages Help Viewer

2012 2013 2014  
année

16:19  
18/01/2021

Pour installer un packages depuis le CRAN  
`install.packages`

Cette installation n'est à faire qu'une fois, par contre dès que l'on veut réellement utiliser le package, il faut utiliser la commande  
`library(ggplot2)`



# Introduction



The screenshot shows the RStudio interface. The source editor on the left contains the following R code:

```
1  
12  
13 library(devtools)  
14  
15 install_github("polehalieutique/demerstem")  
16
```

The Environment panel on the right shows the Global Environment with a data object containing 5 observations of 2 variables. Below the code editor, a plot is visible showing a line graph with data points for the years 2012, 2013, and 2014. The x-axis is labeled 'annee' and the y-axis is partially visible. The status bar at the bottom indicates the date 18/01/2021 and time 16:19.

Pour installer un packages depuis github, il faut d'abord avoir le package (devtools) et une fois ce package chargé - library(devtools) - on a accès à la fonction install\_github



# Introduction



The screenshot shows the RStudio interface with the following elements:

- Code Editor:** Lines 13-15 contain the code:

```
13 library(devtools)
14
15 install_github("polehalieutique/demerstem")
16
```
- Environment Panel:** Shows 'Global Environment' with a 'data' object containing '5 obs. of 2 variables'.
- Plots Panel:** Displays a line graph with x-axis labels '2012', '2013', and '2014'. The y-axis is partially labeled 'année'.
- Taskbar:** Shows the date '18/01/2021' and time '16:19'.

Et ce package demerstem developpé par polehalieutique va nous permettre d'accéder à plein de fonctions que l'on va utiliser cette semaine. Ces fonctions sont encore en cours de développement et on va pouvoir les améliorer encore après cette semaine de test.



# Introduction



## R Markdown

from  R Studio

La dernière petite touche sur l'interface Rstudio, on peut faire des scripts simples où on peut faire du Rmarkdown.

Un fichier Rmarkdown sert à faire des rapports automatiques dans lesquelles on peut ajouter des commentaires, des scripts et les résultats du script.



# Introduction



The image shows a screenshot of the R Studio application window. The 'File' menu is open, displaying a list of options. The 'R Markdown...' option is highlighted. The background shows a code editor with line numbers 1-16 and a console window at the bottom with some text.

File Menu Item	Shortcut	File Type
New File		R Script
New Project...		R Notebook
Open File...	Ctrl+O	R Markdown...
Reopen with Encoding...		Shiny Web App...
Recent Files		Plumber API...
Open Project...		C File
Recent Projects		C++ File
Import Dataset		Header File
Save	Ctrl+S	Markdown File
Save As...		HTML File
Save with Encoding...		CSS File
Save All	Ctrl+Alt+S	JavaScript File
Knit Document	Ctrl+Shift+K	D3 Script
Compile Report...		Python Script
Print...		Shell Script
Close	Ctrl+W	SQL Script
Close All	Ctrl+Shift+W	Stan File
Close All Except Current	Ctrl+Alt+Shift+W	Text File
Close Project		R Sweave
Sign Out		R HTML
		R Presentation

# Introduction



← → ↺ 🏠

**R** File Edit Co

New File

New Project

Open File...

Reopen with

Recent Files

Open Project

Recent Proje

Import Data

Save

Save As...

Save with Er

Save All

Knit Docume

Compile Rep

Print...

Close

Close All

Close All Except Current

Close Project

Sign Out

### New R Markdown

**Document**

Presentation

Shiny

From Template

**Title:** premier script

**Author:** Jerome Guitton

**Default Output Format:**

- HTML**  
Recommended format for authoring (you can switch to PDF or Word output anytime).
- PDF**  
PDF output requires TeX (MiKTeX on Windows, MacTeX 2013+ on OS X, TeX Live 2013+ on Linux).
- Word**  
Previewing Word documents requires an installation of MS Word (or Libre/Open Office on Linux).

Create Empty Document

OK Cancel

15:1

Console

```
/home2  
*** in  
** bui  
** tes  
** tes
```

Text File

R Sweave

R HTML

R Presentation

# Introduction



```
Presentation_intro.rmd x custom.css x R Untitled3* x Rmd Untitled4 x data x
< > ABC Knit Insert Run
1 ---
2 title: "premier script"
3 author: "Jerome Guitton"
4 date: "18/01/2021"
5 output: html_document
6 ---
7
8 ```{r setup, include=FALSE}
9 knitr::opts_chunk$set(echo = TRUE)
10 ```
11
12 ## R Markdown
13
14 This is an R Markdown document. Markdown is a simple formatting syntax
15 for authoring HTML, PDF, and MS Word documents. For more details on
    using R Markdown see <http://rmarkdown.rstudio.com>.
```



# Introduction



The image shows a screenshot of the R Studio File menu. The menu is open, and the 'Save As...' option is highlighted in blue. The menu items include: New File, New Project..., Open File... (Ctrl+O), Reopen with Encoding..., Recent Files, Open Project..., Recent Projects, Import Dataset, Save (Ctrl+S), Save As..., Renam... (with a tooltip 'Save current file to a specific path'), Save with Encoding..., Save All (Ctrl+Alt+S), Knit Document (Ctrl+Shift+K), Publish..., Print..., Close (Ctrl+W), Close All (Ctrl+Shift+W), Close All Except Current (Ctrl+Alt+Shift+W), Close Project, Sign Out, and Quit Session... The background shows a code editor with line numbers 1-16 and a console window at the bottom left.

# Introduction



```
---  
title: "premier script"  
author: "Jerome Guitton"  
date: "18/01/2021"  
output:  
  html_document: default  
  pdf_document: default  
---
```

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

```
## Premiers emois sous R
```

Ceci est un document support de cours sur les évaluations de stock

```
```{r cars}  
data<-data.frame(annee=c(2010,2011,2012,2013,2014),  
                  catches=c(20,50,60,70,70))  
  
head(data)  
  
```
```

```
## Je fais mon premier graphique
```

You can also embed plots, for example:

```
```{r }  
library(ggplot2)  
  
ggplot(data)+geom_line(aes(x=annee,y=catches))  
  
```
```



# Introduction



```
---  
title: "premier script"  
author: "Jerome Guitton"  
date: "18/01/2021"  
output:  
  html_document: default  
  pdf_document: default  
---
```

```
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```

```
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```

# Introduction



Le principe du Rmarkdown c'est que les chunks (en grisé) sont des morceaux de code R qui sont exécutés quand on clique sur le  et qui affichent le résultat dans le document lui-même --> code, résultats du code et commentaires sont intégrés dans le même document et permettent de produire un document propre

```
```{r cars}
data<-data.frame(annee=c(2010,2011,2012,2013,2014),
                  catches=c(20,50,60,70,70))


head(data)
```
```

|   | <b>annee</b><br><dbl> | <b>catches</b><br><dbl> |
|---|-----------------------|-------------------------|
| 1 | 2010                  | 20                      |
| 2 | 2011                  | 50                      |
| 3 | 2012                  | 60                      |
| 4 | 2013                  | 70                      |
| 5 | 2014                  | 70                      |

5 rows

# Introduction



Le principe du Rmarkdown c'est que les chunks (en grisé) sont des morceaux de code R qui sont exécutés quand on clique sur le  et qui affichent le résultat dans le document lui-même --> code, résultats du code et commentaires sont intégrés dans le même document et permettent de produire un document propre



premier script

Jerome Guitton

18/01/2021

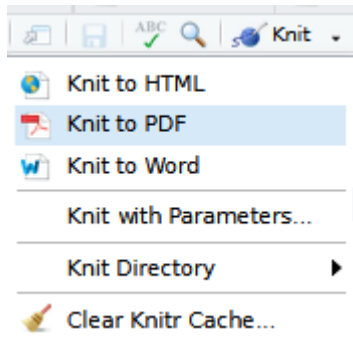
## Premiers mois sous R

Ceci est un document support de cours sur les évaluations de stock

```
data<-data.frame(annee=c(2010,2011,2012,2013,2014),
catches=c(20,50,60,70,70))
```

head(data)

```
## annee catches
## 1 2010      20
## 2 2011      50
## 3 2012      60
## 4 2013      70
## 5 2014      70
```







GT4 - Outils d'évaluation de stocks, Sénégal 1-5 Fev 2021



GT4 - Outils d'évaluation de stocks, Sénégal 1-5 Fev 2021