

# Use of R Software

## Principle and Basics

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La science pour la santé  
From science to health



# Data File in Excel (1)

The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H	I	J	K	L
1	id	age	agecl	sex	sitFamily	wayolife	homeassist	fall	nbdrugs	CV	Psy	Antidiabetic
2	3	87	75+	Woman	Widower	Alone	0	Yes	6	1	0	1
3	6	81	75+	Woman	Widower	Alone	0	No	6	1	1	0
4	7	78	75+	Woman	Widower	Alone	0	No	8	1	0	1
5	10	75	75+	Woman	Widower	Alone	0	No	2	0	1	1
6	12	77	75+	Woman	Widower	Alone	0	No	13	1	1	0
7	19	96	75+	Male	Widower	Alone	1	Yes	3	0	0	1
8	21	78	75+	Woman	Married	Alone	0	Yes	10	1	1	0
9	26	66	65-74	Woman	Widower	Alone	0	No	1	0	1	0
10	29	81	75+	Woman	Widower	Alone	0	No	8	1	0	1
11	40	67	65-74	Woman	Widower	Alone	0	No	3	0	0	0
12	54	81	75+	Woman	Widower	Alone	0	No	2	1	0	0
13	57	83	75+	Woman	Widower	Alone	0	No	3	1	0	0
14	59	92	75+	Woman	Widower	Alone	0	Yes	7	0	1	0

Features Names

Individuals Data

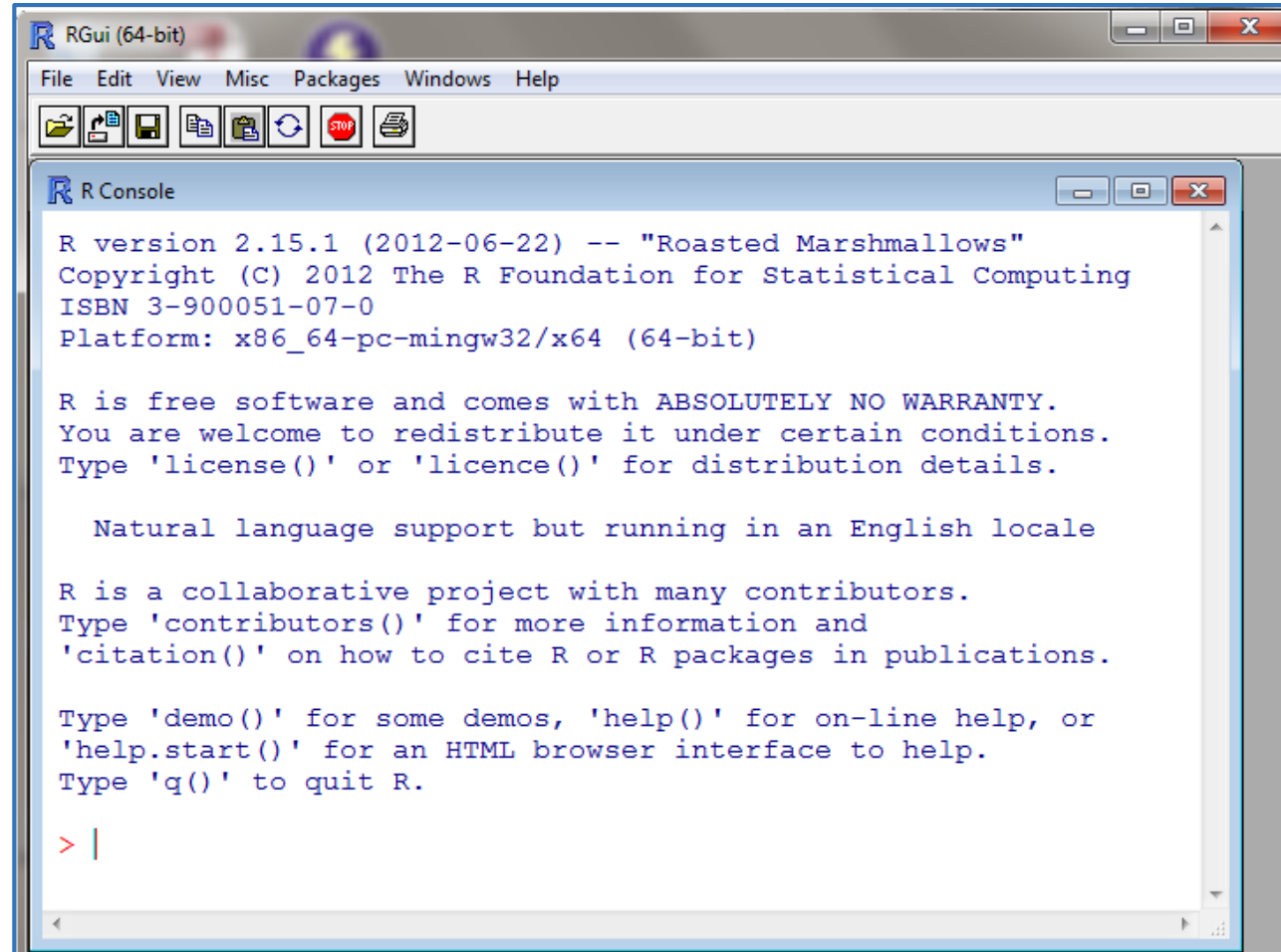
# Data File in Excel (2)

The screenshot shows the Microsoft Excel interface with the 'Save As' dialog box open. The dialog is titled 'Enregistrer sous' and shows the file name 'fallers' and the file type 'CSV (séparateur : point-virgule)'. The text 'Save As' and 'CSV (Comma delimited)(\* .csv)' are circled in red. The background shows an Excel spreadsheet with columns I, J, K, and L, and rows 13 and 14.

	I	J	K	L								
	nbdrugs	CV	Psy	Antidiabetic								
	6	1	0	1								
	6	1	1	0								
	8	1	0	1								
	2	0	1	1								
	13	1	1	0								
	3	0	0	1								
	10	1	1	0								
	1	0	1	0								
	8	1	0	1								
	3	0	0	0								
	2	1	0	0								
13	57	83	75+	Woman	Widower	Alone	0	No	3	1	0	0
14	59	92	75+	Woman	Widower	Alone	0	Yes	7	0	1	0

# R Console

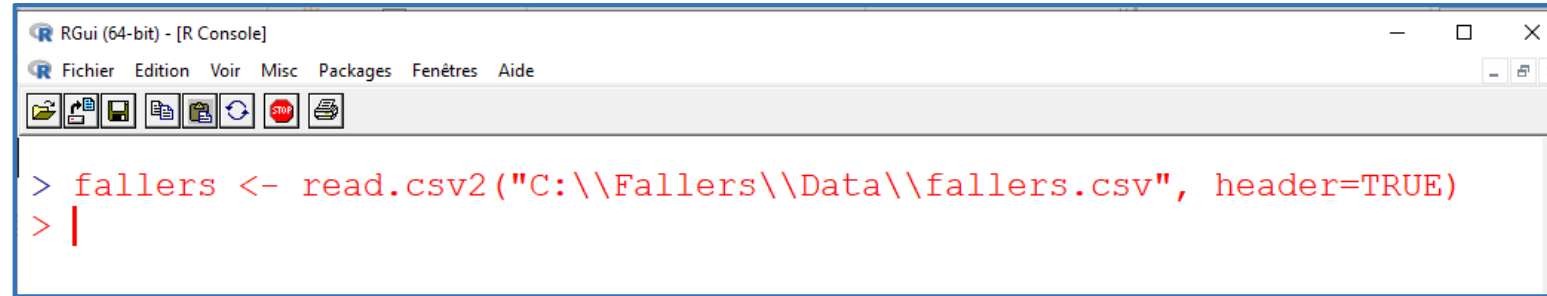
<http://www.r-project.org/>



The screenshot shows the RGui (64-bit) window with the R Console pane open. The console displays the following text:

```
R version 2.15.1 (2012-06-22) -- "Roasted Marshmallows"  
Copyright (C) 2012 The R Foundation for Statistical Computing  
ISBN 3-900051-07-0  
Platform: x86_64-pc-mingw32/x64 (64-bit)  
  
R is free software and comes with ABSOLUTELY NO WARRANTY.  
You are welcome to redistribute it under certain conditions.  
Type 'license()' or 'licence()' for distribution details.  
  
Natural language support but running in an English locale  
  
R is a collaborative project with many contributors.  
Type 'contributors()' for more information and  
'citation()' on how to cite R or R packages in publications.  
  
Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.  
Type 'q()' to quit R.  
  
> |
```

# Reads a Data File



```
RGui (64-bit) - [R Console]
Fichier Edition Voir Misc Packages Fenêtres Aide
> fallers <- read.csv2("C:\\Fallers\\Data\\fallers.csv", header=TRUE)
> |
```

# Writing Rules (1)

①

```
RGui (64-bit) - [R Console]
Fichier Edition Voir Misc Packages Fenêtres Aide
[Icons]
> MyResult <- MyOperation
> |
```

②

③

④

⑤

```
RGui (64-bit) - [R Console]
Fichier Edition Voir Misc Packages Fenêtres Aide
[Icons]
> c(1 : 10)
[1] 1 2 3 4 5 6 7 8 9 10
> MyVector <- c(1 : 10)
> MyVector
[1] 1 2 3 4 5 6 7 8 9 10
> MyVector*10
[1] 10 20 30 40 50 60 70 80 90 100
> |
```

# Data Checking

①

```
> fallers <- read.csv2("C:\\Fallers\\Data\\fallers.csv", header=TRUE)
```

②

```
> head(fallers)
```

```
  id age agecl  sex sitFamily wayolife homeassist fall nbdugs CV Psy Antidiabetic otherdrugs autowalk
1  3  87  75+ Woman  Widower  Alone          0  Yes     6  1  0           1           1  Assist
2  6  81  75+ Woman  Widower  Alone          0  No     6  1  1           0           0    Yes
3  7  78  75+ Woman  Widower  Alone          0  No     8  1  0           1           1    Yes
4 10  75  75+ Woman  Widower  Alone          0  No     2  0  1           1           0    Yes
5 12  77  75+ Woman  Widower  Alone          0  No    13  1  1           0           0  Assist
6 19  96  75+  Male  Widower  Alone          1  Yes     3  0  0           1           1    Yes
> |
```

# Writing Rules (2)

```
> fallers[1:10 , 1:5]
  id age agecl  sex sitFamily
1   3  87  75+ Woman   Widower
2   6  81  75+ Woman   Widower
3   7  78  75+ Woman   Widower
4  10  75  75+ Woman   Widower
5  12  77  75+ Woman   Widower
6  19  96  75+ Male   Widower
7  21  78  75+ Woman   Married
8  26  66 65-74 Woman   Widower
9  29  81  75+ Woman   Widower
10 40  67 65-74 Woman   Widower
> |
```

Lines 1 to 10

Columns 1 to 5



# Properties

```
RGui (64-bit) - [R Console]
Fichier Edition Voir Misc Packages Fenêtres Aide
> attributes(fallers)
① $names
[1] "id"          "age"          "agec1"        "sex"
[5] "sitFamily"   "wayolife"     "homeassist"   "fall"
[9] "nbdrugs"     "CV"           "Psy"          "Antidiabetic"
[13] "otherdrugs"  "autowalk"

② $class
[1] "data.frame"

③ $row.names
[1] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
[19] 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
[37] 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54
[55] 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72
[73] 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90
[91] 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108
[109] 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126
[127] 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144
```

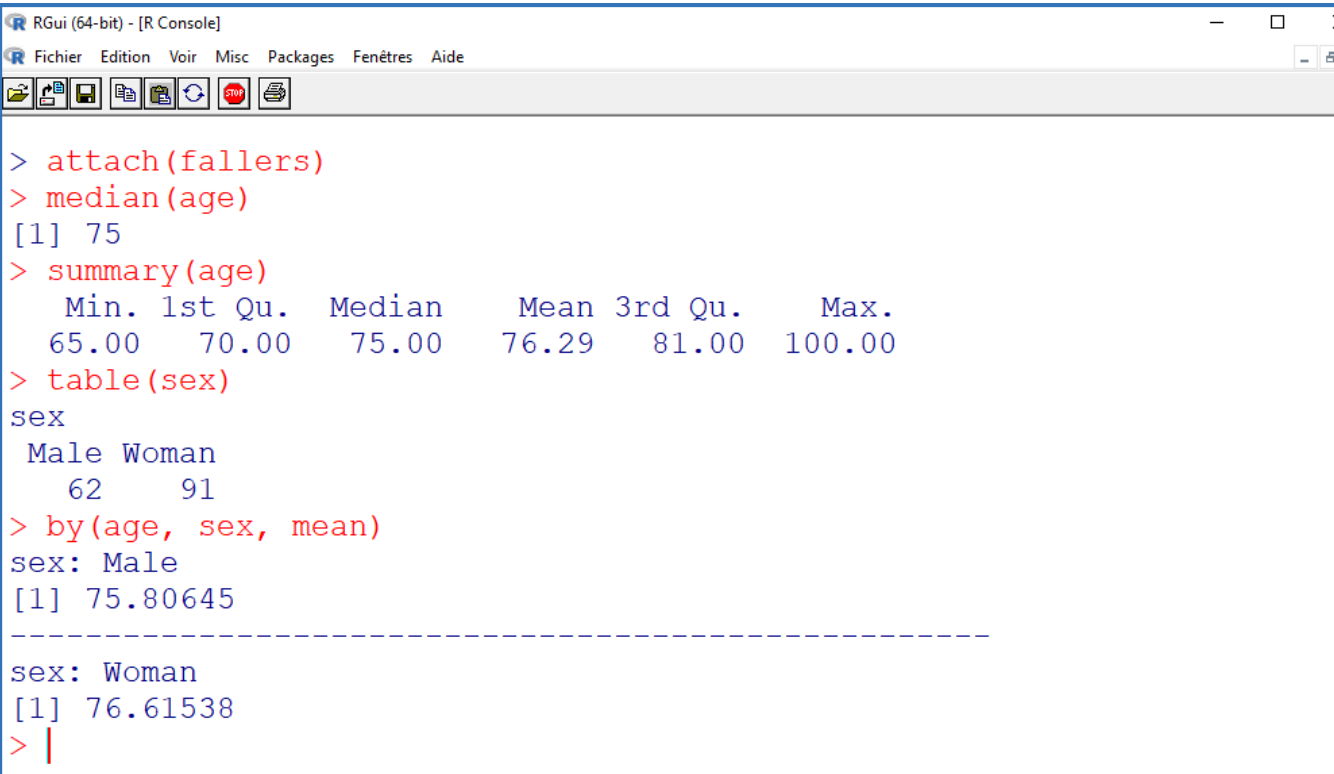
# Use (1)

```
RGui (64-bit) - [R Console]
Fichier Edition Voir Misc Packages Fenêtres Aide
[Icons]

1 > fallers$age
  [1] 87 81 78 75 77 96 78 66 81 67 81 83 92 95 71 71
 [17] 68 85 75 79 80 75 75 69 74 77 85 69 71 78 73 75
 [33] 71 93 77 67 66 66 75 78 74 78 75 77 66 69 83 75
 [49] 76 76 66 66 76 87 71 77 91 92 66 69 68 68 65 87
 [65] 78 75 74 74 75 90 87 75 75 88 90 65 71 83 88 73
 [81] 73 70 77 72 79 67 67 89 73 79 72 71 73 66 74 78
 [97] 72 65 78 87 65 65 69 70 69 82 76 85 82 67 65 73
[113] 68 67 76 73 67 71 71 69 78 79 65 75 75 77 70 78
[129] 74 68 73 70 73 82 84 88 90 90 87 87 100 84 86 99
[145] 90 70 72 89 67 86 73 72 70

2 > median(fallers$age)
  [1] 75
> |
```

# Use (2)



```
RGui (64-bit) - [R Console]
Fichier Edition Voir Misc Packages Fenêtres Aide

1 > attach(fallers)
2 > median(age)
[1] 75
3 > summary(age)
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
65.00  70.00   75.00   76.29  81.00  100.00
4 > table(sex)
sex
Male Woman
  62    91
5 > by(age, sex, mean)
sex: Male
[1] 75.80645
-----
sex: Woman
[1] 76.61538
> |
```

# Use (3)

①

```
> boxplot(age ~ sex, col=c(2, 4), ylab="Age (years)")
```

②

```
> jpeg(file="C:\\Fallers\\Results\\MyBxPlot.jpeg")
```

③

```
> boxplot(age ~ sex, col=c(2, 4), ylab="Age (years)")
```

④

```
> dev.off()
null device
      1
> |
```

# Use (4)

```
1 > wilcox.test(age[sex=="Woman"], age[sex=="Male"], paired=FALSE)

      Wilcoxon rank sum test with continuity correction

data:  age[sex == "Woman"] and age[sex == "Male"]
W = 3005.5, p-value = 0.4936
alternative hypothesis: true location shift is not equal to 0

2 > detach(fallers)
> |
```