Coding the main tex (Rstudio, Excel - in progress)

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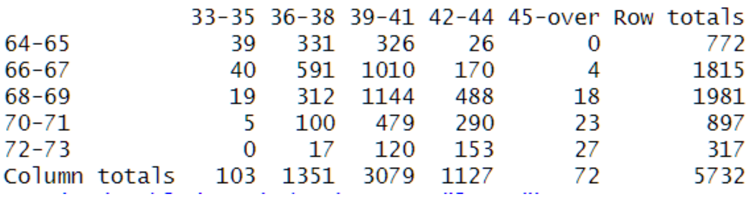
1 Explanation of the codes used in RStudio and Excel

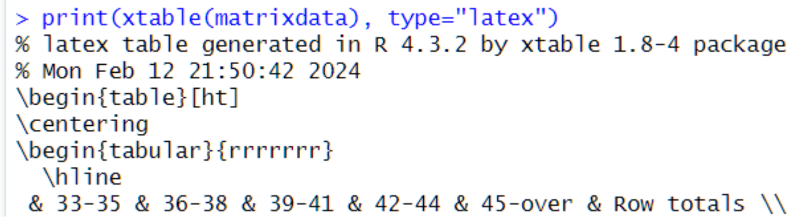
1.1 Rsutio code

```
# Loads the xtable library, which provides functions for exporting
tables to LaTeX or HTML
library(xtable)

# Creates a vector of cells with numeric values
cells <- c(39, 331, 326, 26, 0, 772, 40, 591, 1010, 170, 4, 1815, 19,
312, 1144, 488, 18, 1981, 5, 100, 479, 290, 23, 897, 0, 17, 120, 153,
27, 317, 103, 1351, 3079, 1127, 72, 5732)

# Creates a vector of column names
cnames<-c("33-35", "36-38", "39-41", "42-44", "45-over", "Row totals")

# Creates a vector of line names
rnames<-c("64-65", "66-67", "68-69", "70-71", "72-73", "Column totals")

# Creates a matrix from the vector of cells, with 6 rows and 6 columns,
and assigns the names of the rows and columns
matrixdata<-matrix(cells, nrow=6, ncol=6, byrow=TRUE, dimnames=list(rnames,cnames))

matrixdata #Display the matrix

# Print the matrix as a LaTeX table using the xtable function
print(xtable(matrixdata), type="latex")
-> The final result of this is:
```

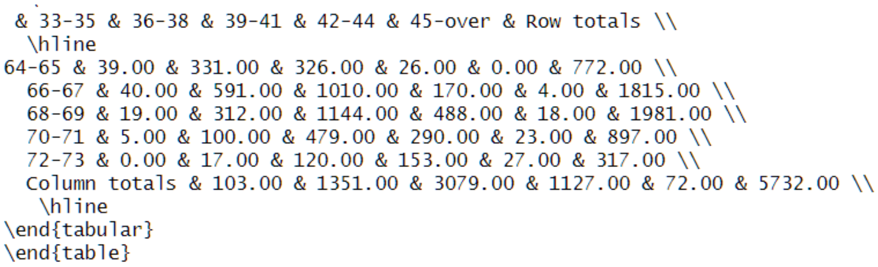
```
> library(xtable)
> cells <- c(39, 331, 326, 26, 0, 772, 40, 591, 1010, 170, 4, 1815, 19, 312, 1144, 488, 18, 1981, 5, 100, 479, 290, 23, 897, 0, 17, 120, 153, 27, 317, 103, 1351, 3079, 1127, 72, 5732)
> cnames<-c("33-35", "36-38", "39-41", "42-44", "45-over", "Row totals")
> rnames<-c("64-65", "66-67", "68-69", "70-71", "72-73", "Column totals")
> matrixdata<-matrix(cells, nrow=6, ncol=6, byrow=TRUE, dimnames=list(rnames,cnames))
> matrixdata
```



```
              33-35 36-38 39-41 42-44 45-over Row totals
64-65            39   331   326    26       0        772
66-67            40   591  1010   170       4       1815
68-69            19   312  1144   488      18       1981
70-71             5   100   479   290      23        897
72-73             0    17   120   153      27        317
Column totals   103  1351  3079  1127      72       5732
```

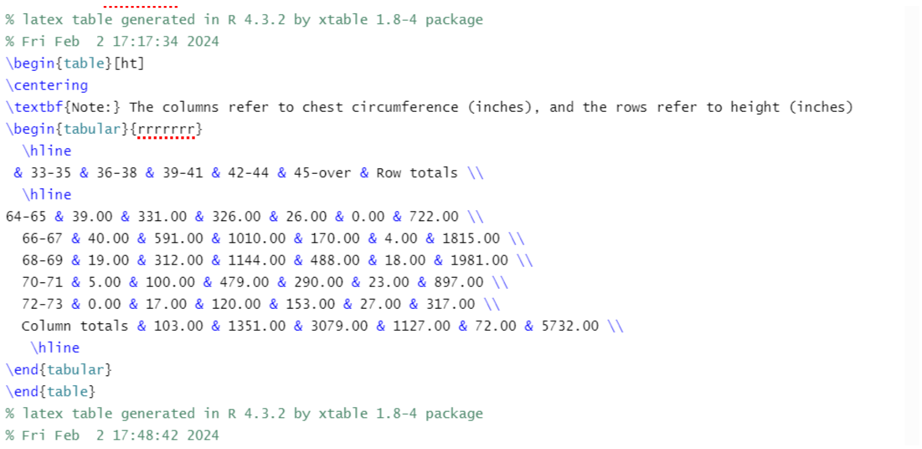


```
> print(xtable(matrixdata), type="latex")
% latex table generated in R 4.3.2 by xtable 1.8-4 package
% Mon Feb 12 21:50:42 2024
\begin{table}[ht]
\centering
\begin{tabular}{rrrrrrr}
  \hline
 & 33-35 & 36-38 & 39-41 & 42-44 & 45-over & Row totals \\
```



```
 & 33-35 & 36-38 & 39-41 & 42-44 & 45-over & Row totals \\
  \hline
64-65 & 39.00 & 331.00 & 326.00 & 26.00 & 0.00 & 772.00 \\
  66-67 & 40.00 & 591.00 & 1010.00 & 170.00 & 4.00 & 1815.00 \\
  68-69 & 19.00 & 312.00 & 1144.00 & 488.00 & 18.00 & 1981.00 \\
  70-71 & 5.00 & 100.00 & 479.00 & 290.00 & 23.00 & 897.00 \\
  72-73 & 0.00 & 17.00 & 120.00 & 153.00 & 27.00 & 317.00 \\
  Column totals & 103.00 & 1351.00 & 3079.00 & 1127.00 & 72.00 & 5732.00 \\
   \hline
\end{tabular}
\end{table}
```

Where I simply copy the code and paste in LaTex:



```
% latex table generated in R 4.3.2 by xtable 1.8-4 package
% Fri Feb  2 17:17:34 2024
\begin{table}[ht]
\centering
\textbf{Note:} The columns refer to chest circumference (inches), and the rows refer to height (inches)
\begin{tabular}{rrrrrrr}
  \hline
 & 33-35 & 36-38 & 39-41 & 42-44 & 45-over & Row totals \\
  \hline
64-65 & 39.00 & 331.00 & 326.00 & 26.00 & 0.00 & 722.00 \\
  66-67 & 40.00 & 591.00 & 1010.00 & 170.00 & 4.00 & 1815.00 \\
  68-69 & 19.00 & 312.00 & 1144.00 & 488.00 & 18.00 & 1981.00 \\
  70-71 & 5.00 & 100.00 & 479.00 & 290.00 & 23.00 & 897.00 \\
  72-73 & 0.00 & 17.00 & 120.00 & 153.00 & 27.00 & 317.00 \\
  Column totals & 103.00 & 1351.00 & 3079.00 & 1127.00 & 72.00 & 5732.00 \\
   \hline
\end{tabular}
\end{table}
% latex table generated in R 4.3.2 by xtable 1.8-4 package
% Fri Feb  2 17:48:42 2024
```

The use of fig:enter-label is for future reference: reference each image individually elsewhere in your document using `\ref{fig:label1}, \ref{fig:label2}`, etc.

1.2 Rsutudio code

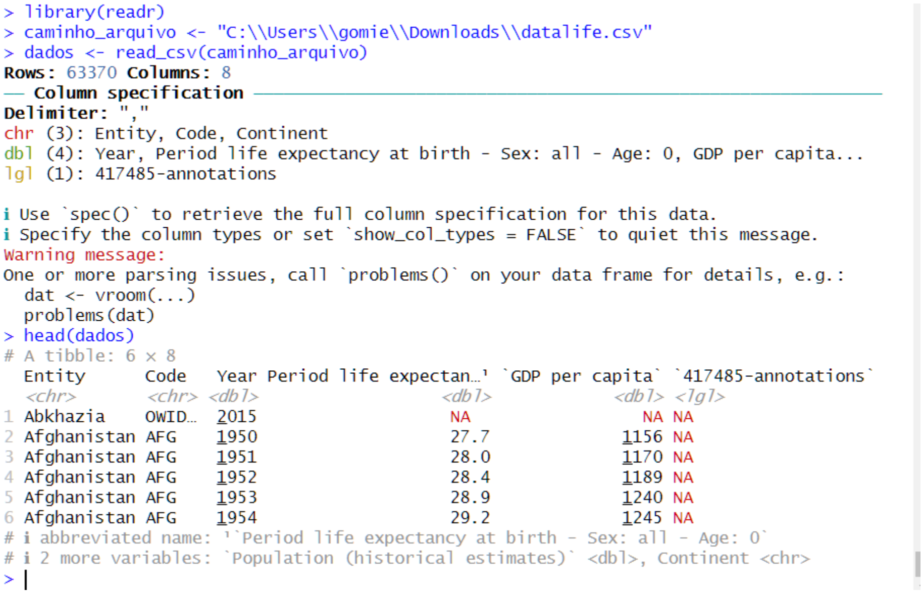
The following code is akin to the first one. In fact, only the content changes, but the structure and the results remain unchanged.

```
# Creates a second vector of cells with numeric values
cells2<-c(66.31, 66.84, 67.89, 69.16, 70.53, 38.41, 39.19, 40.26, 40.76,
41.80)

# Creates a vector of line names
rnames2<-c("mean of height given chest-inches ", "mean of chest given
height-inches")

# Creates a second matrix from the cell vector, with 2 rows and 5 columns,
and assigns the row names
matrixresum<-matrix(cells2, nrow=2, ncol=5, byrow=TRUE, dimnames=list(rnames2))

matrixresum #Display the matrix

# Print the matrix as a LaTeX table using the xtable function
print(xtable(matrixresum), type="latex")
```

1.3 Rstudio code

```
# Install the package 'readr', which contains functions for reading
tabulated data.
install.packages("readr")

# Load the package "readr" for use
library(readr)

# Defines the path to the file CSV that needs to be read
caminho_arquivo <- "C:\\Users\\gomie\\Downloads\\datalife.csv"

# Read the CSV file and save its content in the variable "dados".
dados <- read_csv(caminho_arquivo)

# Exhibit the first 6 lines of the dataset.
head(dados)
```

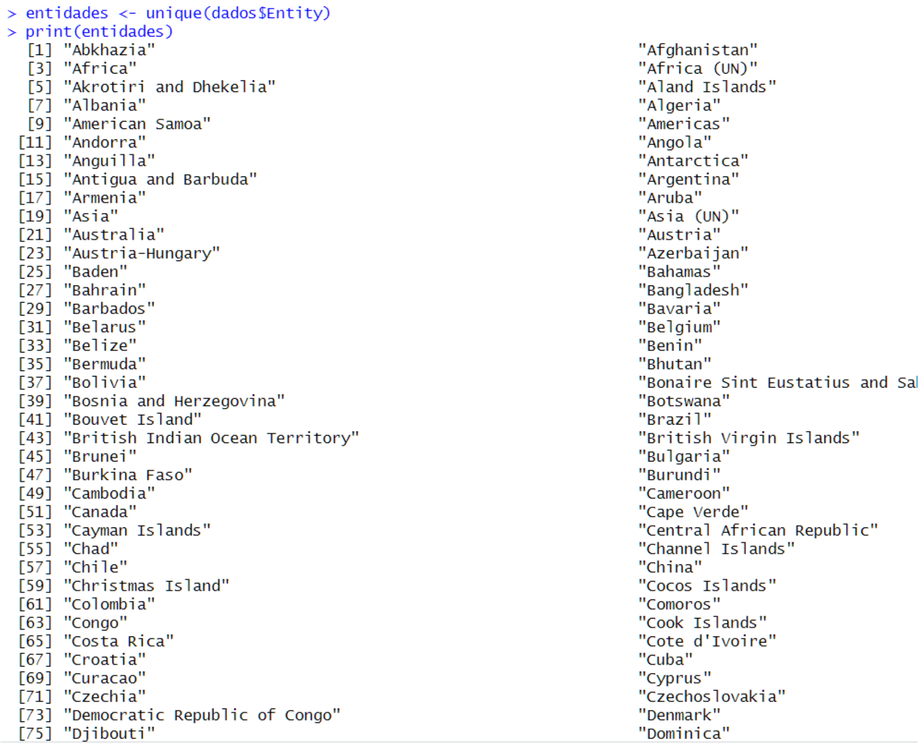
The result of these first lines above is this in the Rstudio:



```
> library(readr)
> caminho_arquivo <- "C:\\Users\\gomie\\Downloads\\datalife.csv"
> dados <- read_csv(caminho_arquivo)
Rows: 63370 Columns: 8
── Column specification ────────────────────────────────────────────────────────
Delimiter: ","
chr (3): Entity, Code, Continent
dbl (4): Year, Period life expectancy at birth - Sex: all - Age: 0, GDP per capita...
lgl (1): 417485-annotations

i Use `spec()` to retrieve the full column specification for this data.
i Specify the column types or set `show_col_types = FALSE` to quiet this message.
Warning message:
One or more parsing issues, call `problems()` on your data frame for details, e.g.:
  dat <- vroom(...)
  problems(dat)
> head(dados)
# A tibble: 6 × 8
  Entity      Code   Year Period life expectan…¹ `GDP per capita` `417485-annotations`
  <chr>       <chr> <dbl>                  <dbl>            <dbl> <lgl>
1 Abkhazia    OWID…  2015                   NA                 NA NA
2 Afghanistan AFG    1950                   27.7             1156 NA
3 Afghanistan AFG    1951                   28.0             1170 NA
4 Afghanistan AFG    1952                   28.4             1189 NA
5 Afghanistan AFG    1953                   28.9             1240 NA
6 Afghanistan AFG    1954                   29.2             1245 NA
# i abbreviated name: ¹`Period life expectancy at birth - Sex: all - Age: 0`
# i 2 more variables: `Population (historical estimates)` <dbl>, Continent <chr>
> |
```

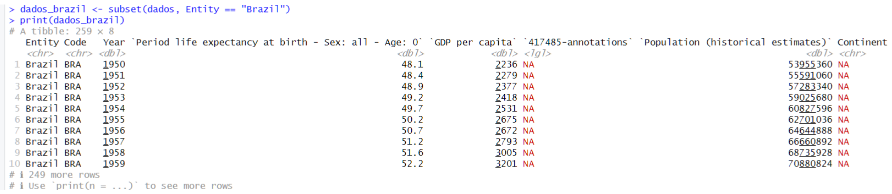
```
# Finds unique values in the 'Entity' column of the dataset and stores
them in the 'entities' variable.

entidades <- unique(dados$Entity)

# Prints the unique values found.
print(entidades)

# Creates a subset of the data where the entity is 'Brazil' and stores
it in the variable 'dados_brazil'.
dados_brazil <- subset(dados, Entity == "Brazil")

#Prints the data subset for 'Brazil'.
print(dados_brazil)
```

The result of these first lines above is this in the Rstudio (continues until [327]:



```
> entidades <- unique(dados$Entity)
> print(entidades)
 [1] "Abkhazia"                                                     "Afghanistan"
 [3] "Africa"                                                       "Africa (UN)"
 [5] "Akrotiri and Dhekelia"                                        "Aland Islands"
 [7] "Albania"                                                      "Algeria"
 [9] "American Samoa"                                               "Americas"
[11] "Andorra"                                                      "Angola"
[13] "Anguilla"                                                     "Antarctica"
[15] "Antigua and Barbuda"                                          "Argentina"
[17] "Armenia"                                                      "Aruba"
[19] "Asia"                                                         "Asia (UN)"
[21] "Australia"                                                    "Austria"
[23] "Austria-Hungary"                                              "Azerbaijan"
[25] "Baden"                                                        "Bahamas"
[27] "Bahrain"                                                      "Bangladesh"
[29] "Barbados"                                                     "Bavaria"
[31] "Belarus"                                                      "Belgium"
[33] "Belize"                                                       "Benin"
[35] "Bermuda"                                                      "Bhutan"
[37] "Bolivia"                                                      "Bonaire Sint Eustatius and Sal
[39] "Bosnia and Herzegovina"                                       "Botswana"
[41] "Bouvet Island"                                                "Brazil"
[43] "British Indian Ocean Territory"                               "British Virgin Islands"
[45] "Brunei"                                                       "Bulgaria"
[47] "Burkina Faso"                                                 "Burundi"
[49] "Cambodia"                                                     "Cameroon"
[51] "Canada"                                                       "Cape Verde"
[53] "Cayman Islands"                                               "Central African Republic"
[55] "Chad"                                                         "Channel Islands"
[57] "Chile"                                                        "China"
[59] "Christmas Island"                                             "Cocos Islands"
[61] "Colombia"                                                     "Comoros"
[63] "Congo"                                                        "Cook Islands"
[65] "Costa Rica"                                                   "Cote d'Ivoire"
[67] "Croatia"                                                      "Cuba"
[69] "Curacao"                                                      "Cyprus"
[71] "Czechia"                                                      "Czechoslovakia"
[73] "Democratic Republic of Congo"                                 "Denmark"
[75] "Djibouti"                                                     "Dominica"
```

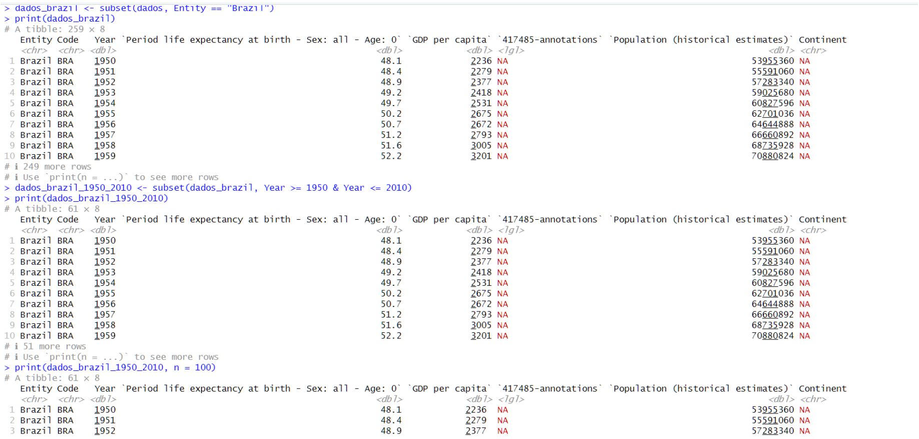
and:



```
> dados_brazil <- subset(dados, Entity == "Brazil")
> print(dados_brazil)
# A tibble: 259 × 8
   Entity Code   Year `Period life expectancy at birth - Sex: all - Age: 0` `GDP per capita` `417485-annotations` `Population (historical estimates)` Continent
   <chr>  <chr> <dbl>                                                 <dbl>            <dbl> <lgl>                                                         <dbl> <chr>
 1 Brazil BRA    1950                                                  48.1             2236 NA                                                         53955360 NA
 2 Brazil BRA    1951                                                  48.4             2279 NA                                                         55591060 NA
 3 Brazil BRA    1952                                                  48.9             2377 NA                                                         57283340 NA
 4 Brazil BRA    1953                                                  49.2             2418 NA                                                         59025680 NA
 5 Brazil BRA    1954                                                  49.7             2531 NA                                                         60827596 NA
 6 Brazil BRA    1955                                                  50.2             2675 NA                                                         62701036 NA
 7 Brazil BRA    1956                                                  50.7             2672 NA                                                         64644888 NA
 8 Brazil BRA    1957                                                  51.2             2793 NA                                                         66660892 NA
 9 Brazil BRA    1958                                                  51.6             3005 NA                                                         68735928 NA
10 Brazil BRA    1959                                                  52.2             3201 NA                                                         70880824 NA
# ℹ 249 more rows
# ℹ Use `print(n = ...)` to see more rows
```

```
# Creates a subset of the data for 'Brazil' where the year is between
1950 and 2010.
dados_brazil_1950_2010 <- subset(dados_brazil, Year >= 1950 & Year
<= 2010)

# Prints the subset of data for 'Brazil' between 1950 and 2010.
print(dados_brazil_1950_2010)

# Prints the first 100 rows of the data subset for 'Brazil' between
1950 and 2010
print(dados_brazil_1950_2010, n = 100)
```

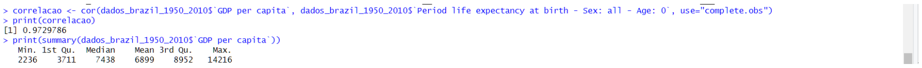
The result of these first lines above is this in the Rstudio (the last one continues until 2010) :



```
> dados_brazil <- subset(dados, Entity == "Brazil")
> print(dados_brazil)
# A tibble: 259 × 8
   Entity Code   Year `Period life expectancy at birth - Sex: all - Age: 0` `GDP per capita` `417485-annotations` `Population (historical estimates)` Continent
   <chr>  <chr> <dbl>                                                 <dbl>            <dbl> <lgl>                                                 <dbl> <chr>    
 1 Brazil BRA    1950                                                  48.1             2236 NA                                                 53955360 NA       
 2 Brazil BRA    1951                                                  48.4             2279 NA                                                 55591060 NA       
 3 Brazil BRA    1952                                                  48.9             2377 NA                                                 57283340 NA       
 4 Brazil BRA    1953                                                  49.2             2418 NA                                                 59025680 NA       
 5 Brazil BRA    1954                                                  49.7             2531 NA                                                 60827596 NA       
 6 Brazil BRA    1955                                                  50.2             2675 NA                                                 62701036 NA       
 7 Brazil BRA    1956                                                  50.7             2672 NA                                                 64644888 NA       
 8 Brazil BRA    1957                                                  51.2             2793 NA                                                 66660892 NA       
 9 Brazil BRA    1958                                                  51.6             3005 NA                                                 68735928 NA       
10 Brazil BRA    1959                                                  52.2             3201 NA                                                 70880824 NA       
# ℹ 249 more rows
# ℹ Use `print(n = ...)` to see more rows
> dados_brazil_1950_2010 <- subset(dados_brazil, Year >= 1950 & Year <= 2010)
> print(dados_brazil_1950_2010)
# A tibble: 61 × 8
   Entity Code   Year `Period life expectancy at birth - Sex: all - Age: 0` `GDP per capita` `417485-annotations` `Population (historical estimates)` Continent
   <chr>  <chr> <dbl>                                                 <dbl>            <dbl> <lgl>                                                 <dbl> <chr>    
 1 Brazil BRA    1950                                                  48.1             2236 NA                                                 53955360 NA       
 2 Brazil BRA    1951                                                  48.4             2279 NA                                                 55591060 NA       
 3 Brazil BRA    1952                                                  48.9             2377 NA                                                 57283340 NA       
 4 Brazil BRA    1953                                                  49.2             2418 NA                                                 59025680 NA       
 5 Brazil BRA    1954                                                  49.7             2531 NA                                                 60827596 NA       
 6 Brazil BRA    1955                                                  50.2             2675 NA                                                 62701036 NA       
 7 Brazil BRA    1956                                                  50.7             2672 NA                                                 64644888 NA       
 8 Brazil BRA    1957                                                  51.2             2793 NA                                                 66660892 NA       
 9 Brazil BRA    1958                                                  51.6             3005 NA                                                 68735928 NA       
10 Brazil BRA    1959                                                  52.2             3201 NA                                                 70880824 NA       
# ℹ 51 more rows
# ℹ Use `print(n = ...)` to see more rows
> print(dados_brazil_1950_2010, n = 100)
# A tibble: 61 × 8
   Entity Code   Year `Period life expectancy at birth - Sex: all - Age: 0` `GDP per capita` `417485-annotations` `Population (historical estimates)` Continent
   <chr>  <chr> <dbl>                                                 <dbl>            <dbl> <lgl>                                                 <dbl> <chr>    
 1 Brazil BRA    1950                                                  48.1             2236 NA                                                 53955360 NA       
 2 Brazil BRA    1951                                                  48.4             2279 NA                                                 55591060 NA       
 3 Brazil BRA    1952                                                  48.9             2377 NA                                                 57283340 NA       
```

```
# Calculates the correlation between 'GDP per capita' and 'Period life
expectancy at birth - Sex: all - Age: 0' for 'Brazil' between 1950
and 2010.
# "complete.obs": excludes pairs of observations with the NA value
in the corresponding variable. This means that observations must be
complete for each variable analyzed.
correlacao <- cor(dados_brazil_1950_2010$`GDP per capita`, dados_brazil_1950_2010$`Period
life expectancy at birth - Sex: all - Age: 0`, use="complete.obs")

# Prints the calculated correlation value.
print(correlacao)

# Prints a statistical summary for 'GDP per capita' for 'Brazil' between 1950 and 2010.
print(summary(dados_brazil_1950_2010$`GDP per capita`))
```

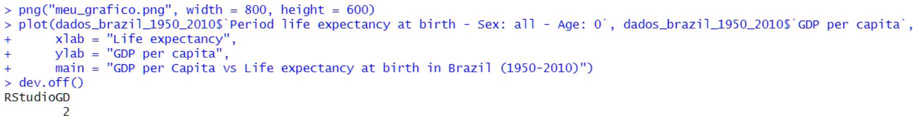
The result of these first lines above is this in the Rstudio:



```
> correlacao <- cor(dados_brazil_1950_2010$`GDP per capita`, dados_brazil_1950_2010$`Period life expectancy at birth - Sex: all - Age: 0`, use="complete.obs")
> print(correlacao)
[1] 0.9729786
> print(summary(dados_brazil_1950_2010$`GDP per capita`))
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max. 
   2236    3711    7438    6899    8952   14216 
```

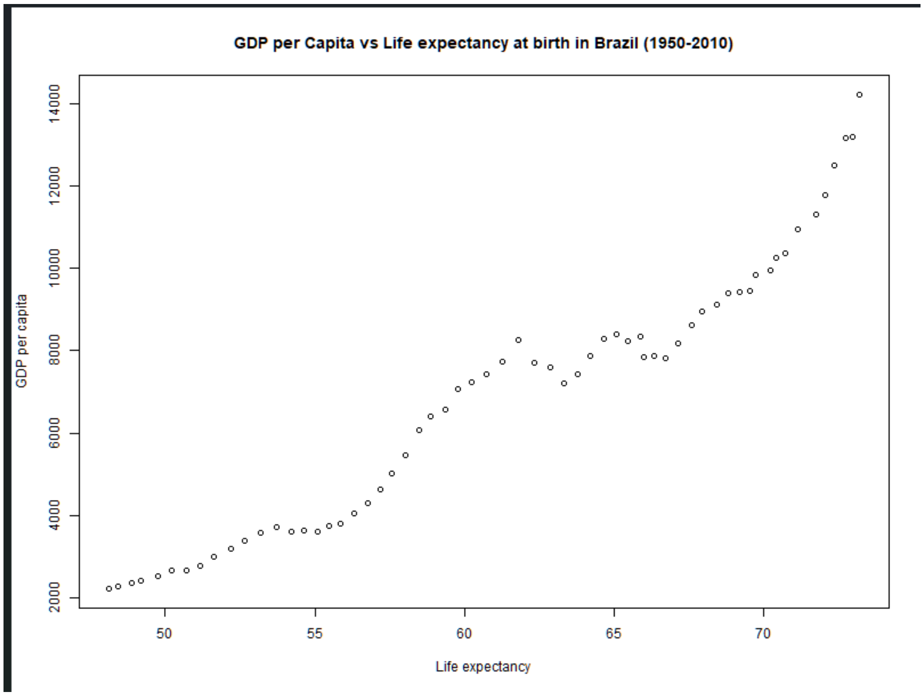
```
# Starts recording a graphic to a PNG file.
# The first argument of png, in this case "meu_grafico.png" indicates
the name of the file that will be saved.
png("meu_grafico.png", width = 800, height = 600)

# Creates a scatterplot of 'GDP per capita' versus 'Period life expectancy
at birth - Sex: all - Age: 0' for 'Brazil' between 1950 and 2010.
plot(dados_brazil_1950_2010$`Period life expectancy at birth - Sex:
all - Age: 0`, dados_brazil_1950_2010$`GDP per capita`,
     xlab = "Life expectancy",
     ylab = "GDP per capita",
     main = "GDP per Capita vs Life expectancy at birth in Brazil (1950-2010)")

# Closes the graphics device and saves the PNG file.
dev.off()

#The value 2 that is returned after calling dev.off() indicates that
the RStudioGD graphics device is now active again. This means that
any subsequent graphs you create will be displayed in RStudio’s plot
window, rather than being routed to a PNG file.
#To know where the file will be saved, you need to check the current
working folder. It is possible to find out which one it is using the
getwd() command.
If you want to change the current working folder, you can do this with
the setwd() function.
Example: setwd("C:\Users\gomie\OneDrive\estat"). Remember to replace
the slash \ with 2 single slashes \\ or one backslash.
To manually add a specific save location, it would be for example:
png("C:/Users/gomie/OneDrive/estat/meu_grafico.png", width = 800, height
= 600)
```

The result of these first lines above is this in the Rstudio:



```
> png("meu_grafico.png", width = 800, height = 600)
> plot(dados_brazil_1950_2010$`Period life expectancy at birth - Sex: all - Age: 0`, dados_brazil_1950_2010$`GDP per capita`,
+      xlab = "Life expectancy",
+      ylab = "GDP per capita",
+      main = "GDP per Capita vs Life expectancy at birth in Brazil (1950-2010)")
> dev.off()
RStudioGD
        2
```

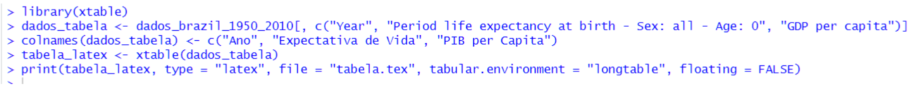
meu_grafico ✓ 13/02/2024 19:42 Arquivo PNG 7 KB



```
# Install the ’xtable’ package, which provides functions for exporting
tables to LaTeX or HTML.
install.packages("xtable")

# Load the ’xtable’ package for use.
library(xtable)

# Creates a subset of the data for ’Brazil’ between 1950 and 2010 with
the columns ’Year’, ’Period life expectancy at birth - Sex: all - Age:
0’, and ’GDP per capita’.
# In R, the comma is used to separate dimensions in an array or a data
frame. The part before the comma refers to the rows and the part after
the comma refers to the columns.
dados_brazil_1950_2010[, c("Year", "Period life expectancy at birth
- Sex: all - Age: 0", "GDP per capita")], the part before the comma
is empty, which means selecting all lines in the table of data. The
part after the comma is a vector of column names, which means selecting
only those specific columns.
dados_tabela <- dados_brazil_1950_2010[, c("Year", "Period life expectancy
at birth - Sex: all - Age: 0", "GDP per capita")]

# Rename the data subset columns.
#In R, the colnames() function is used to get or set the names of the
```

```
columns of an object, such as a data frame. In the code, colnames(table_data)
<- c("Year", "Life Expectancy", "GDP per Capita") is redefining the
names of the columns of the table_data data frame.
colnames(dados_tabela) <- c("Ano", "Expectativa de Vida", "PIB per
Capita"

# Converts the subset of data into a LaTeX table.
tabela_latex <- xtable(dados_tabela)

# Prints the LaTeX table in a file called 'table.tex'.
#type="latex": This specifies to print the object as LaTeX code.
file = "table.tex": This specifies the name of the file where the LaTeX
code will be saved. In this case, the code will be saved in a file
called \table.tex". tabular.environment = "longtable": This specifies
the LaTeX longtable environment for the table. The longtable environment
allows tables to span multiple pages, which is useful for very long
tables. floating = FALSE: In LaTeX, tables are typically placed in
a floating environment, which means that LaTeX can move the table to
a different location to better fit the page. If floating = FALSE, the
table will be placed exactly where it appears in the code, and will
not be moved.
print(tabela_latex, type = "latex", file = "tabela.tex", tabular.environment
= "longtable", floating = FALSE)
```

The result of these first lines above is this in the Rstudio:



```
> library(xtable)
> dados_tabela <- dados_brazil_1950_2010[, c("Year", "Period life expectancy at birth - Sex: all - Age: 0", "GDP per capita")]
> colnames(dados_tabela) <- c("Ano", "Expectativa de Vida", "PIB per Capita")
> tabela_latex <- xtable(dados_tabela)
> print(tabela_latex, type = "latex", file = "tabela.tex", tabular.environment = "longtable", floating = FALSE)
>
```

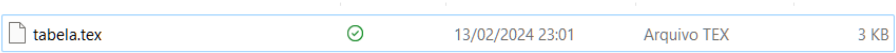
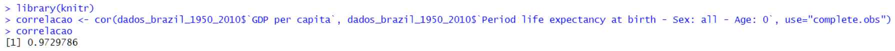


tabela.tex ✓ 13/02/2024 23:01 Arquivo TEX 3 KB

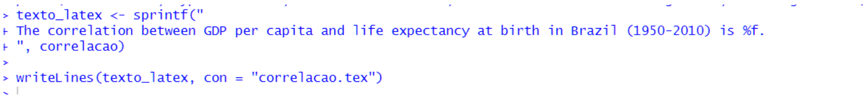
```
# To save the file in a specific location, include the full file path
in the file argument. On Windows, use double slashes (\\) or backslashes
(/).
print(tabela_latex, type = "latex", file = "C:/Users/gomie/OneDrive/estat/tabela.tex",
tabular.environment = "longtable", floating = FALSE)

# Install the 'knitr' package, which provides functions for dynamic
reporting.
install.packages("knitr")

# Carrega o pacote 'knitr' para uso.
library(knitr)
```

```
# Calculates the correlation between ’GDP per capita’ and ’Period life
expectancy at birth - Sex: all - Age: 0’ for ’Brazil’ between 1950
and 2010.
correlacao <- cor(dados_brazil_1950_2010$‘GDP per capita‘, dados_brazil_1950_2010$‘Period
life expectancy at birth - Sex: all - Age: 0‘, use="complete.obs")

# The sprintf function is used to format a string. It replaces each
format specifier (%f) in the string with the value of the corresponding
variable (in this case, ’correlation’).
texto_latex <- sprintf("The correlation between GDP per capita and
life expectancy at birth in Brazil (1950-2010) is %f.", correlacao)

# The writeLines() function is used to write text to a file. writeLines(texto_latex,
con = "correlacao.tex") is writing the contents of text_latex to a
file called \correlacao.tex". The con argument specifies the file name.
writeLines(texto_latex, con = "correlacao.tex")
```

The result of these first lines above is this in the Rstudio:



```
> library(knitr)
> correlacao <- cor(dados_brazil_1950_2010$`GDP per capita`, dados_brazil_1950_2010$`Period life expectancy at birth - Sex: all - Age: 0`, use="complete.obs")
> correlacao
[1] 0.9729786
```



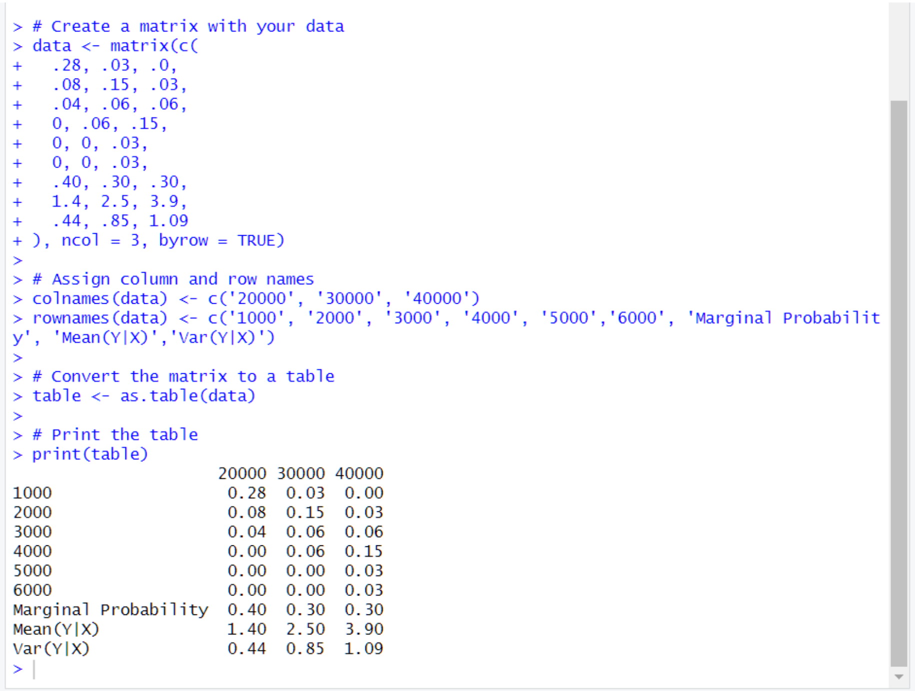
```
> texto_latex <- sprintf("
+ The correlation between GDP per capita and life expectancy at birth in Brazil (1950-2010) is %f.
+ ", correlacao)
>
> writeLines(texto_latex, con = "correlacao.tex")
```

correlacao.tex ✓ 13/02/2024 23:15 Arquivo TEX 1 KB

1.4 Rstudio code

```
# Creates a matrix with the data
#This part of the code creates an array called data with 3 columns.
Numbers are entered into the matrix row by row (byrow = TRUE).
data <- matrix(c(
  .28, .03, .0,
  .08, .15, .03,
  .04, .06, .06,
  0, .06, .15,
  0, 0, .03,
  0, 0, .03,
  .40, .30, .30,
  1.4, 2.5, 3.9,
  .44, .85, 1.09
), ncol = 3, byrow = TRUE)

# Assign names to columns and rows
colnames(data) <- c(’20000’, ’30000’, ’40000’)
rownames(data) <- c(’1000’, ’2000’, ’3000’, ’4000’, ’5000’,’6000’,
’Marginal Probability’, ’Mean(Y|X)’,’Var(Y|X)’)

# Converts the matrix to a table
table <- as.table(data)

# Print the table
print(table)
```

The result of these first lines above is this in the Rstudio:

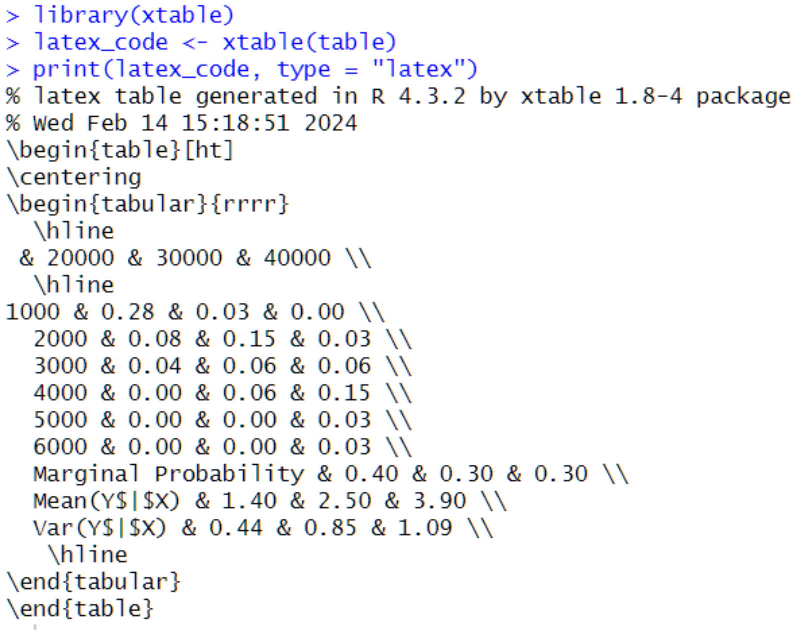


```
> # Create a matrix with your data
> data <- matrix(c(
+   .28, .03, .0,
+   .08, .15, .03,
+   .04, .06, .06,
+   0, .06, .15,
+   0, 0, .03,
+   0, 0, .03,
+   .40, .30, .30,
+   1.4, 2.5, 3.9,
+   .44, .85, 1.09
+ ), ncol = 3, byrow = TRUE)
>
> # Assign column and row names
> colnames(data) <- c('20000', '30000', '40000')
> rownames(data) <- c('1000', '2000', '3000', '4000', '5000','6000', 'Marginal Probabilit
y', 'Mean(Y|X)','Var(Y|X)')
>
> # Convert the matrix to a table
> table <- as.table(data)
>
> # Print the table
> print(table)
                     20000 30000 40000
1000                  0.28  0.03  0.00
2000                  0.08  0.15  0.03
3000                  0.04  0.06  0.06
4000                  0.00  0.06  0.15
5000                  0.00  0.00  0.03
6000                  0.00  0.00  0.03
Marginal Probability  0.40  0.30  0.30
Mean(Y|X)             1.40  2.50  3.90
Var(Y|X)              0.44  0.85  1.09
>
```

```
# This line loads the xtable library. The xtable library is an R package
that provides an easy way to export tables from R to LaTeX or HTML.
library(xtable)

# Here, the xtable() function of the xtable library is used to convert
the R table into a LaTeX table. The result is stored in the latex_code
variable.
latex_code <- xtable(table)
```

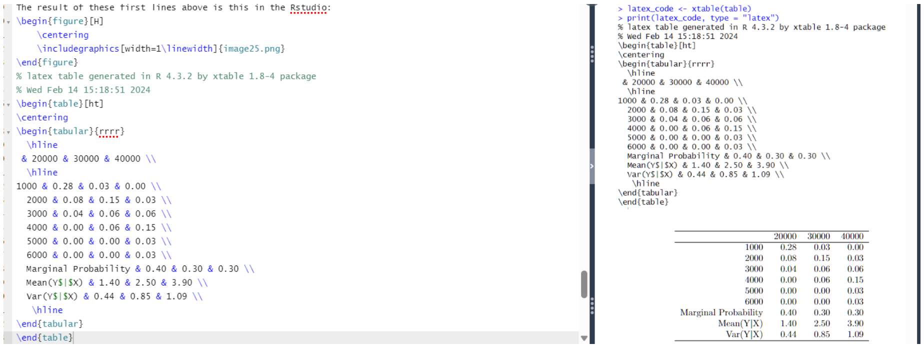
```
# This line prints the LaTeX table to the console. The type="latex"
argument specifies that the table should be printed as LaTeX code.
print(latex_code, type = "latex")
```

The result of these first lines above is this in the Rstudio:



```
> library(xtable)
> latex_code <- xtable(table)
> print(latex_code, type = "latex")
% latex table generated in R 4.3.2 by xtable 1.8-4 package
% Wed Feb 14 15:18:51 2024
\begin{table}[ht]
\centering
\begin{tabular}{rrrr}
  \hline
 & 20000 & 30000 & 40000 \\
  \hline
1000 & 0.28 & 0.03 & 0.00 \\
  2000 & 0.08 & 0.15 & 0.03 \\
  3000 & 0.04 & 0.06 & 0.06 \\
  4000 & 0.00 & 0.06 & 0.15 \\
  5000 & 0.00 & 0.00 & 0.03 \\
  6000 & 0.00 & 0.00 & 0.03 \\
  Marginal Probability & 0.40 & 0.30 & 0.30 \\
  Mean(Y$|$X) & 1.40 & 2.50 & 3.90 \\
  Var(Y$|$X) & 0.44 & 0.85 & 1.09 \\
   \hline
\end{tabular}
\end{table}
```

It would be possible to just paste the text into LaTeX and the table would appear, as in the following image:



```
The result of these first lines above is this in the Rstudio:
\begin{figure}[H]
    \centering
    \includegraphics[width=1\linewidth]{image25.png}
\end{figure}
% latex table generated in R 4.3.2 by xtable 1.8-4 package
% Wed Feb 14 15:18:51 2024
\begin{table}[ht]
\centering
\begin{tabular}{rrrr}
  \hline
 & 20000 & 30000 & 40000 \\
  \hline
1000 & 0.28 & 0.03 & 0.00 \\
  2000 & 0.08 & 0.15 & 0.03 \\
  3000 & 0.04 & 0.06 & 0.06 \\
  4000 & 0.00 & 0.06 & 0.15 \\
  5000 & 0.00 & 0.00 & 0.03 \\
  6000 & 0.00 & 0.00 & 0.03 \\
  Marginal Probability & 0.40 & 0.30 & 0.30 \\
  Mean(Y$|$X) & 1.40 & 2.50 & 3.90 \\
  Var(Y$|$X) & 0.44 & 0.85 & 1.09 \\
   \hline
\end{tabular}
\end{table}
```

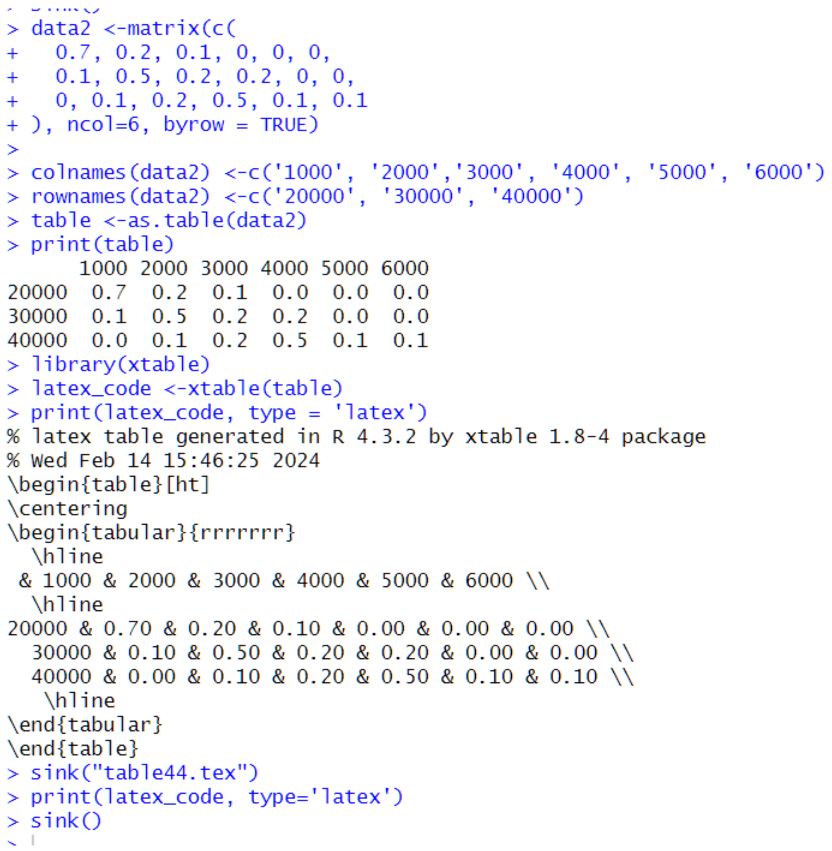
```
> latex_code <- xtable(table)
> print(latex_code, type = "latex")
% latex table generated in R 4.3.2 by xtable 1.8-4 package
% Wed Feb 14 15:18:51 2024
\begin{table}[ht]
\centering
\begin{tabular}{rrrr}
  \hline
 & 20000 & 30000 & 40000 \\
  \hline
1000 & 0.28 & 0.03 & 0.00 \\
  2000 & 0.08 & 0.15 & 0.03 \\
  3000 & 0.04 & 0.06 & 0.06 \\
  4000 & 0.00 & 0.06 & 0.15 \\
  5000 & 0.00 & 0.00 & 0.03 \\
  6000 & 0.00 & 0.00 & 0.03 \\
  Marginal Probability & 0.40 & 0.30 & 0.30 \\
  Mean(Y$|$X) & 1.40 & 2.50 & 3.90 \\
  Var(Y$|$X) & 0.44 & 0.85 & 1.09 \\
   \hline
\end{tabular}
\end{table}
```

	20000	30000	40000
1000	0.28	0.03	0.00
2000	0.08	0.15	0.03
3000	0.04	0.06	0.06
4000	0.00	0.06	0.15
5000	0.00	0.00	0.03
6000	0.00	0.00	0.03
Marginal Probability	0.40	0.30	0.30
Mean(Y|X)	1.40	2.50	3.90
Var(Y|X)	0.44	0.85	1.09

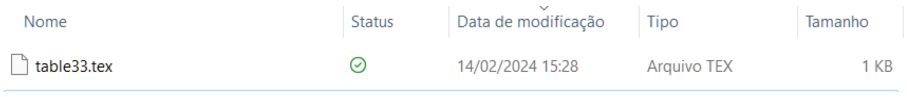
```
#The sink() function redirects the R console output to a file. In this
case, the output will be redirected to the table33.tex file. If the
file does not exist, it will be created
sink("table33.tex")
```

```
#This line prints the LaTeX table again, but this time the output will
be written to the table33.tex file because the sink() function was
called previously.
print(latex_code, type = "latex")

#Finally, this line closes the connection to the table33.tex file.
This means that the R console output will be redirected back to the
console. It is important to always close the connection to the file
after you have finished writing to it to avoid problems.
sink()
```

The result of these first lines above is this in the Rstudio:



```
> data2 <-matrix(c(
+   0.7, 0.2, 0.1, 0, 0, 0,
+   0.1, 0.5, 0.2, 0.2, 0, 0,
+   0, 0.1, 0.2, 0.5, 0.1, 0.1
+ ), ncol=6, byrow = TRUE)
>
> colnames(data2) <-c('1000', '2000','3000', '4000', '5000', '6000')
> rownames(data2) <-c('20000', '30000', '40000')
> table <-as.table(data2)
> print(table)
      1000 2000 3000 4000 5000 6000
20000  0.7  0.2  0.1  0.0  0.0  0.0
30000  0.1  0.5  0.2  0.2  0.0  0.0
40000  0.0  0.1  0.2  0.5  0.1  0.1
> library(xtable)
> latex_code <-xtable(table)
> print(latex_code, type = 'latex')
% latex table generated in R 4.3.2 by xtable 1.8-4 package
% Wed Feb 14 15:46:25 2024
\begin{table}[ht]
\centering
\begin{tabular}{rrrrrrr}
  \hline
 & 1000 & 2000 & 3000 & 4000 & 5000 & 6000 \\
  \hline
20000 & 0.70 & 0.20 & 0.10 & 0.00 & 0.00 & 0.00 \\
  30000 & 0.10 & 0.50 & 0.20 & 0.20 & 0.00 & 0.00 \\
  40000 & 0.00 & 0.10 & 0.20 & 0.50 & 0.10 & 0.10 \\
   \hline
\end{tabular}
\end{table}
> sink("table44.tex")
> print(latex_code, type='latex')
> sink()
```

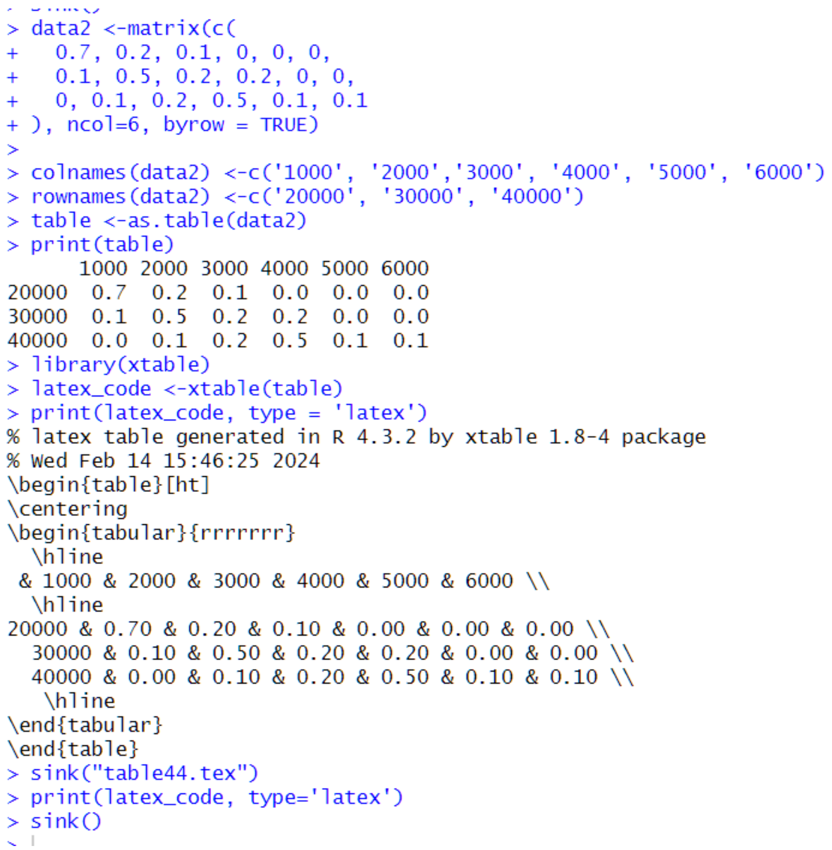


Nome	Status	Data de modificação	Tipo	Tamanho
table33.tex	✓	14/02/2024 15:28	Arquivo TEX	1 KB

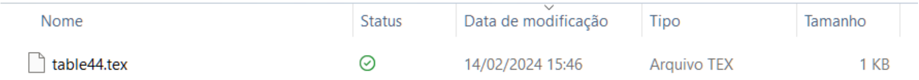
```
#This line creates a matrix called data2 with 6 columns. Numbers are
entered into the matrix row by row (byrow = TRUE).
data2 <-matrix(c(
  0.7, 0.2, 0.1, 0, 0, 0,
  0.1, 0.5, 0.2, 0.2, 0, 0,
  0, 0.1, 0.2, 0.5, 0.1, 0.1
), ncol=6, byrow = TRUE)

# These two lines assign names to the columns and rows of the data2
matrix, respectively
colnames(data2) <-c(’1000’, ’2000’,’3000’, ’4000’, ’5000’, ’6000’)
rownames(data2) <-c(’20000’, ’30000’, ’40000’)

# This line converts the data2 array into a table. The as.table() function
is used for this conversion.
table <-as.table(data2)

# This line prints the table to the console. The print() function is
used for this printing.
print(table)

#This line loads the xtable library. The xtable library is an R package
that provides an easy way to export tables from R to LaTeX or HTML.
library(xtable)

# This line uses the xtable() function from the xtable library to convert
the R table into a LaTeX table. The result is stored in the latex_code
variable.
latex_code <-xtable(table)

# This line prints the LaTeX table to the console. The print() function
is used for this printing. The type = ’latex’ argument specifies that
the table should be printed as LaTeX code.
print(latex_code, type = ’latex’)

# This line redirects the R console output to a file called table44.tex.
The sink() function is used for this redirection. If the file does
not exist, it will be created.
sink("table44.tex")

# This line prints the LaTeX table again. However, this time the output
will be written to the table44.tex file because the sink() function
was called previously.
print(latex_code, type=’latex’)

# This line closes the connection with the table44.tex file. This means
```

```
that the R console output will be redirected back to the console. It
is important to always close the connection to the file after you have
finished writing to it to avoid problems.
sink()
```

The result of these first lines above is this in the Rstudio:



```
> data2 <-matrix(c(
+   0.7, 0.2, 0.1, 0, 0, 0,
+   0.1, 0.5, 0.2, 0.2, 0, 0,
+   0, 0.1, 0.2, 0.5, 0.1, 0.1
+ ), ncol=6, byrow = TRUE)
>
> colnames(data2) <-c('1000', '2000','3000', '4000', '5000', '6000')
> rownames(data2) <-c('20000', '30000', '40000')
> table <-as.table(data2)
> print(table)
      1000 2000 3000 4000 5000 6000
20000  0.7  0.2  0.1  0.0  0.0  0.0
30000  0.1  0.5  0.2  0.2  0.0  0.0
40000  0.0  0.1  0.2  0.5  0.1  0.1
> library(xtable)
> latex_code <-xtable(table)
> print(latex_code, type = 'latex')
% latex table generated in R 4.3.2 by xtable 1.8-4 package
% Wed Feb 14 15:46:25 2024
\begin{table}[ht]
\centering
\begin{tabular}{rrrrrrr}
  \hline
 & 1000 & 2000 & 3000 & 4000 & 5000 & 6000 \\
  \hline
20000 & 0.70 & 0.20 & 0.10 & 0.00 & 0.00 & 0.00 \\
  30000 & 0.10 & 0.50 & 0.20 & 0.20 & 0.00 & 0.00 \\
  40000 & 0.00 & 0.10 & 0.20 & 0.50 & 0.10 & 0.10 \\
   \hline
\end{tabular}
\end{table}
> sink("table44.tex")
> print(latex_code, type='latex')
> sink()
```



Nome	Status	Data de modificação	Tipo	Tamanho
table44.tex	✓	14/02/2024 15:46	Arquivo TEX	1 KB