Creating a Board Game with R

#Galipoly

Jose Ameijeiras–Alonso

MODESTYA Group
University of Santiago de Compostela

Creating a Board Game with R
  Creating the board
    Starting at the beginning

Ingredients:

- Statistical software R.
- `library(base)`
- `library(graphics)`
- `library(grDevices)`
- `library(tcltk2)`

Basic functions:

- Concatenate: `c`
- Repeat elements: `rep`
- Length of the vector: `length`
- Sample: `sample`
- Sum of values: `sum`; `cumsum`

Basic control flow constructions:

- Conditional: `if(cond) expr`
- Count–controlled loop:
  `for(var in seq) expr`
- Condition–controlled loops:
  `while(cond) expr`
- Apply a function several times:
  `apply; lapply; sapply`

Creating a Board Game with R
Creating the board
The board

Creating the window:

- Create the window: `plot`
- Control the margins: `par`
- Control the width and height: `windows.options`

First steps for constructing the board:

- Create the lines: `segments`
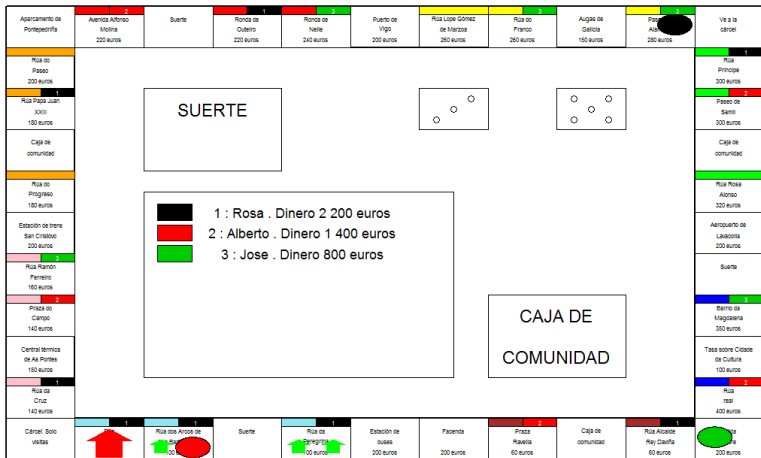- Create polygons: `polygon`
- Create points: `points`

Creating a Board Game with R
  Creating the board
    The board
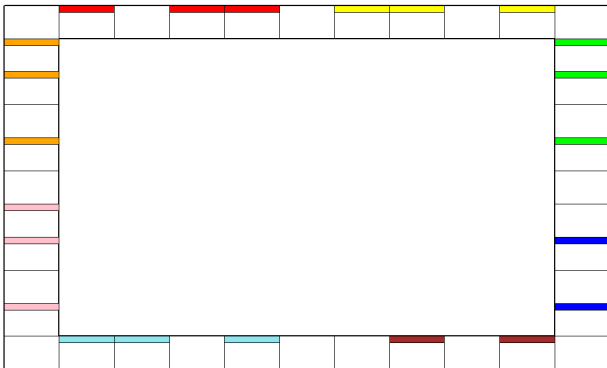
Writing the name of the streets:

- Draw words in the plot: text
- Size of the window:
  dev.size
- Number of characters: nchar

- Concatenate vectors: paste
- Split the elements of a vector:
  strsplit

Rúa Lope Gómez de Marzoa 260 euros	Rúa do Franco 260 euros	Augas de Galicia 150 euros	Paseo da Alameda 280 euros	Ve a la cárcel
				Rúa Principe 300 euros
				Paseo de Samil 300 euros
				Caja de comunidad
				Rúa Rosa Alonso 320 euros

Creating a Board Game with R
  Creating the board
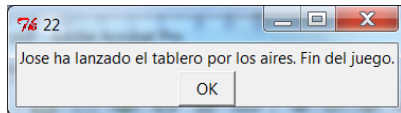   The board

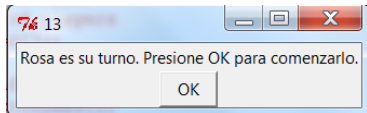## The complete board

- Create a function: `function(arg){statements;`
  `return(object)}`
- Running a code (from other script): `source`

Creating a Board Game with R
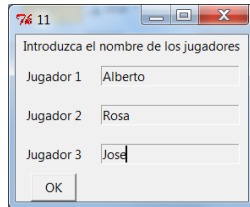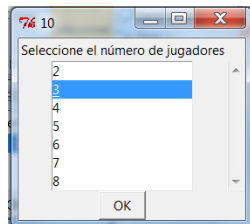 Dynamic of the game
    Graphical interface

The graphical interface

- library(tcltk2)
- Call the graphical interface: gi<-tktoplevel()
- Print the desired text in the box:
  tkgrid(tklabel(gi,text=''text''))
- Remove the graphical interface:
  OnOK<-function(){tkdestroy(gi)}
- Create an OK button:
  OK.but<-tkbutton(gi,text="OK",command=OnOK)
- Insert the OK button: tkgrid(OK.but)
- Wait until the action is done: tkwait.window(gi)

13 — Rosa es su turno. Presione OK para comenzarlo. [OK]

22 — Jose ha lanzado el tablero por los aires. Fin del juego. [OK]

Creating a Board Game with R
Dynamic of the game
Graphical interface

Other options

- Create a scroll bar: `tkscrollbar`
- A space for introducing a list: `tklistbox`
- Insert an option in the list: `tkinsert`
- Preselect an option: `tkselection.set`
- Save the current selection: `tkcurselection`

- Declare a Tcl variable with the default option: `x1<-tclVar()`
- The box to introduce the text: `x2<-tkentry(tt,textvariable=x1)`
- Insert it: `tkgrid(tklabel(gi,text=''text'',x2))`

Creating a Board Game with R
  Dynamic of the game
    The chance and community chest cards

Cards actions

Te desplazas a
la casilla 16

Pague 25 euros
a cada jugador

Con esta carta sale
de prisión

Esta carta no
tiene efecto

Creating a Board Game with R
  Dynamic of the game
    Buy process

Buying properties and houses

- If the player lands on an unowned property, he/she can buy the property for its listed purchase price.
- If the property landed on is already owned and unmortgaged, they must pay the owner a given rent.
- Houses (hotels) can only be built once a player owns all the properties in that color group.

Creating a Board Game with R
  Dynamic of the game
    Sell process
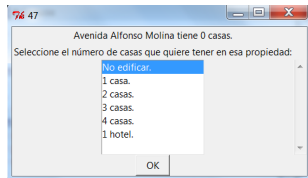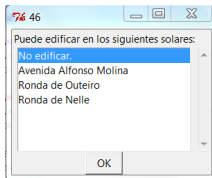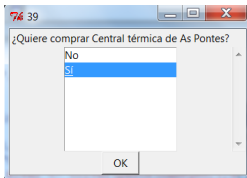
Selling properties and houses

- Players can sell properties or buildings at the same price that they bought them.
- They can mortgage properties at a fixed price.
- To unmortgage it, players can pay the mortgage price plus 10%.

Creating a Board Game with R
  Dynamic of the game
    Jail
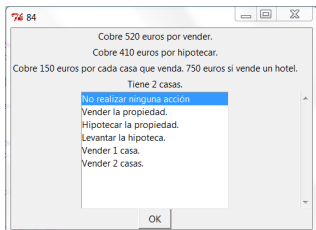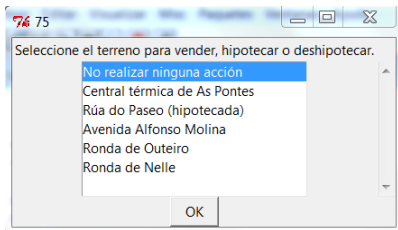
The jail

A player is sent to jail for doing any of the following:

- Landing directly on "Go to Jail".
- Throwing three consecutive doubles on one turn
- Drawing the "Go to Jail" card from either the Community Chest or Chance deck

To be released:

- Pay a fine.
- Use a Chance or Community Chest Get Out of Jail Free card.
- Roll doubles on the dice.

Creating a Board Game with R
  Dynamic of the game
    To close...
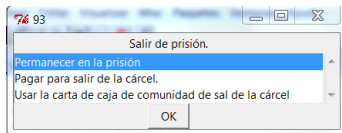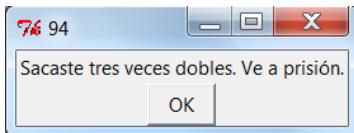
How can I play?

- Download from
  github.com/jose-ameijeiras
- In game_Galipoly.R change the folder path.
- Run the script.

What can be changed?

- The name of the streets: names_Galipoly.R
- The currency.
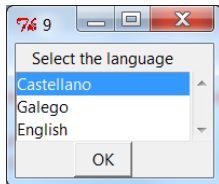- New languages can be added: laguage_xx_Galipoly.R

```
#Where the files are
folder="C:/Users/Usuario/Documents/Galipoly/"

#Dimensions of the window
width.window=20
height.window=12

#Script with the name of the streets
foldernam=paste(folder,"names_Galipoly.R",sep="")
source(foldernam)

#Coins
coins=c("ptas.","euros","dollars","pounds")
#The money converter
factorcoins=c(1000,10,10,10)

#Script with the language
languagesavail=c("Castellano","Galego","English")
languageChoice=GI1()
if(languageChoice==1){
folderlan=paste(folder,
"laguage_es_Galipoly.R",sep="")}
```

Creating a Board Game with R
Dynamic of the game
To close...

#EIOSdCpoly

github.com/jose-ameijeiras/galipoly

Creating a Board Game with R

#Galipoly

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MODESTYA Group
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github.com/jose-ameijeiras/galipoly
jose.ameijeiras@usc.es