Data Visualisation using Plotly in R.

As Data for my project I used some gapminder.org files (Total population, Income per capita, Food supply in kcal per person per day, Life expectancy, Government present of allocations for health) and some files for country division into regions and ISO codes.

As tool for project was used library Plotly in R.

For the project were used following libraries:

```
# Loading packages

library(plotly)
library(ggplot2)
library(dplyr)
library(plyr)
library(readr)
library(choroplethr)
library(choroplethrMaps)

#install.packages("choroplethr")
#install.packages("choroplethrMaps")
```

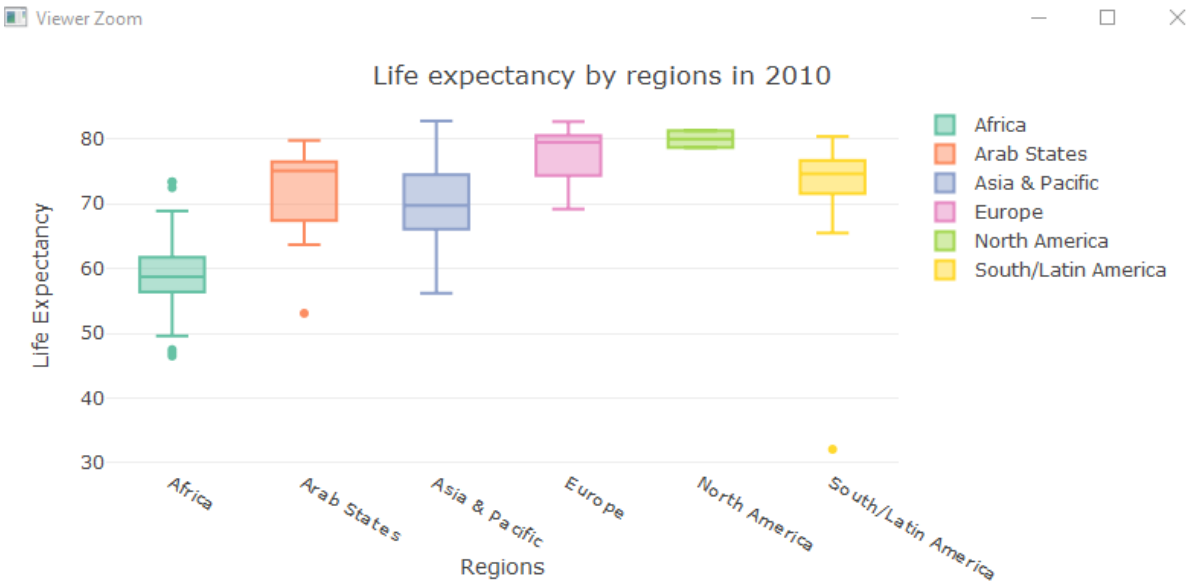
In first part of the project I read Data from .csv files.

As files that I got were very different one from another, I decided to limit my project to most consistent years between 1995 and 2010. All other years were dropped from my dataset.

After this I gathered all years into one column and merged all information in one dataset

```
> head(df_total)
      country year  gdp lexp health growth food         Region      pop Codes
1 Afghanistan 2010 1610 56.2   1.59   2.81 2100 Asia & Pacific 28800000   AFG
2 Afghanistan 2007 1290 54.6   1.48   2.76 2050 Asia & Pacific 26600000   AFG
3 Afghanistan 2000  972 51.6     NA   3.49 1790 Asia & Pacific 20100000   AFG
4 Afghanistan 2008 1300 55.2   1.48   2.51 2040 Asia & Pacific 27300000   AFG
5 Afghanistan 2003 1100 53.0   1.48   4.82 1890 Asia & Pacific 23100000   AFG
6 Afghanistan 1996  904 51.4     NA   4.14 1840 Asia & Pacific 17800000   AFG
>
```

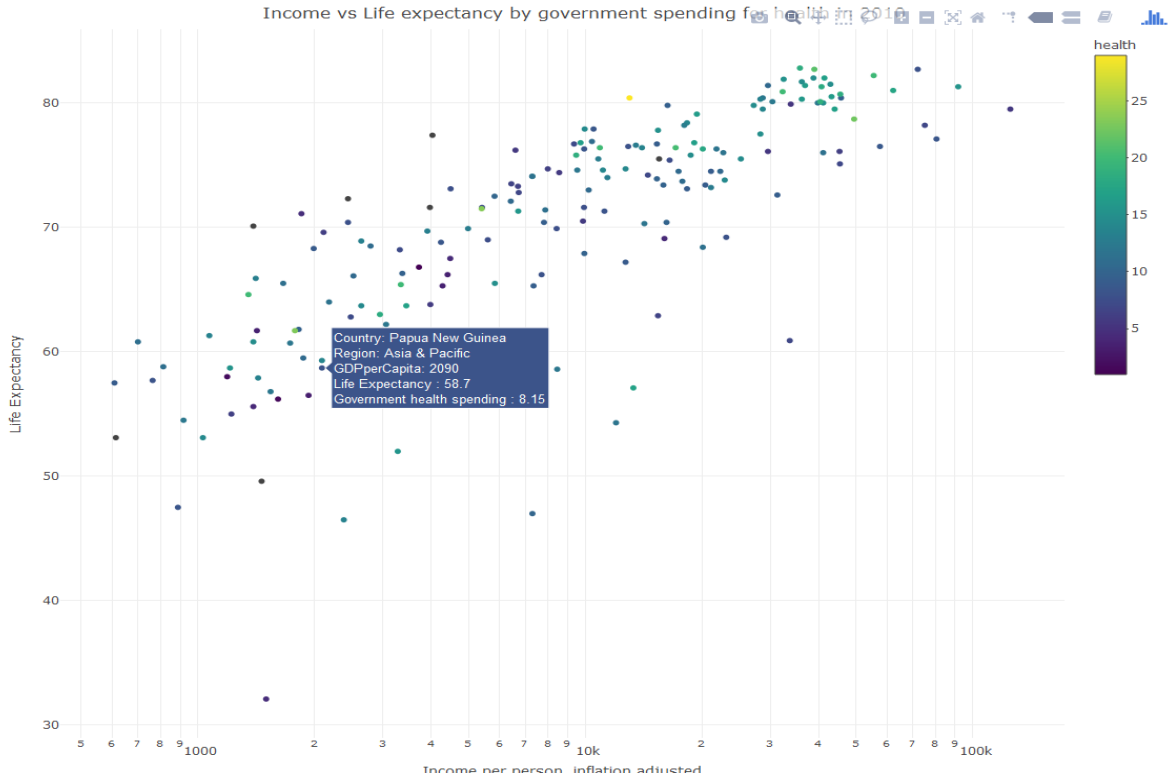
The first chart is a boxplot of life expectancy per region:



It shows the lowest life expectancy for African countries.

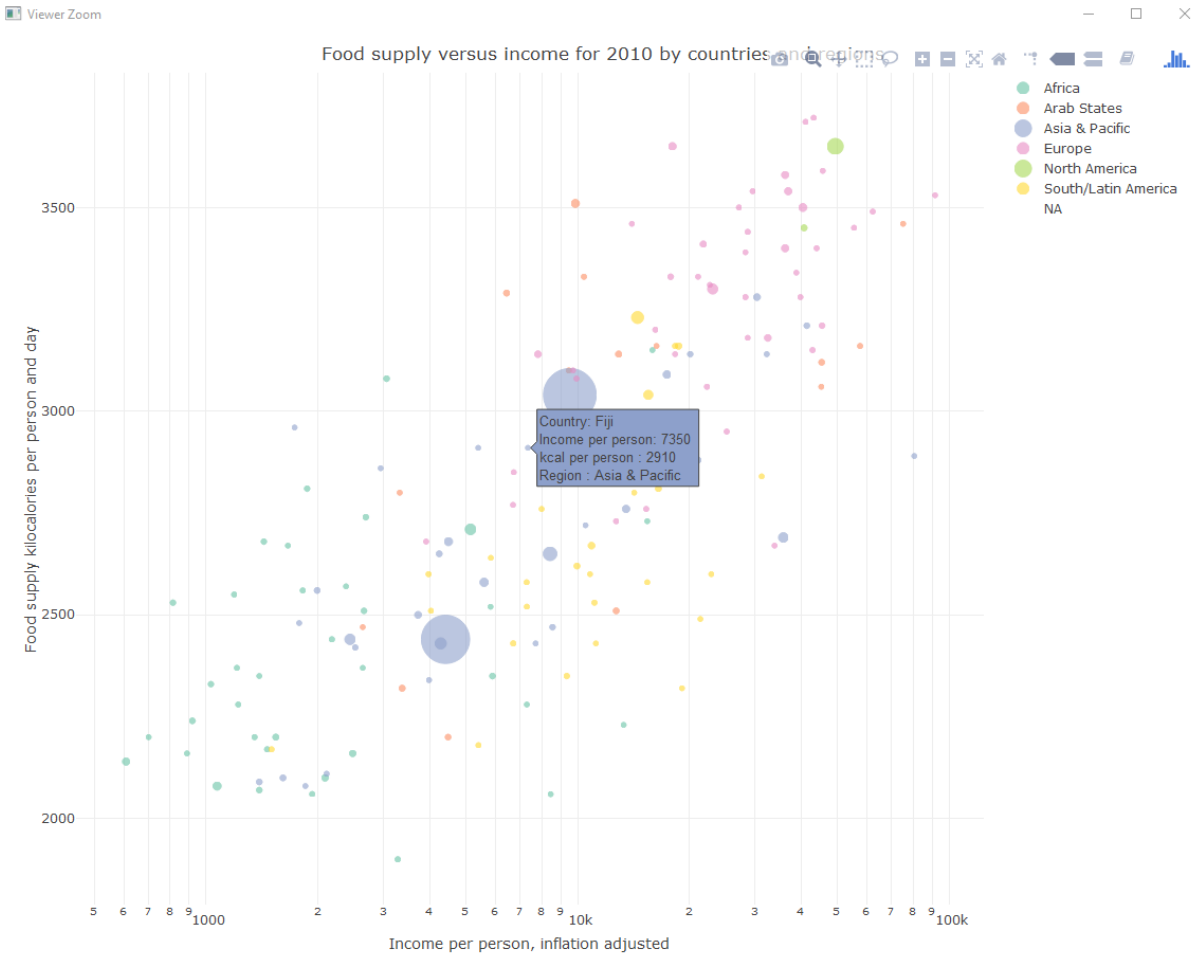
I decided to do a research and find if there is a correlation between life expectancy and other variables.

Next chart is a static scatter plot of Income vs Life expectancy and government allocation for health as variable for color group.



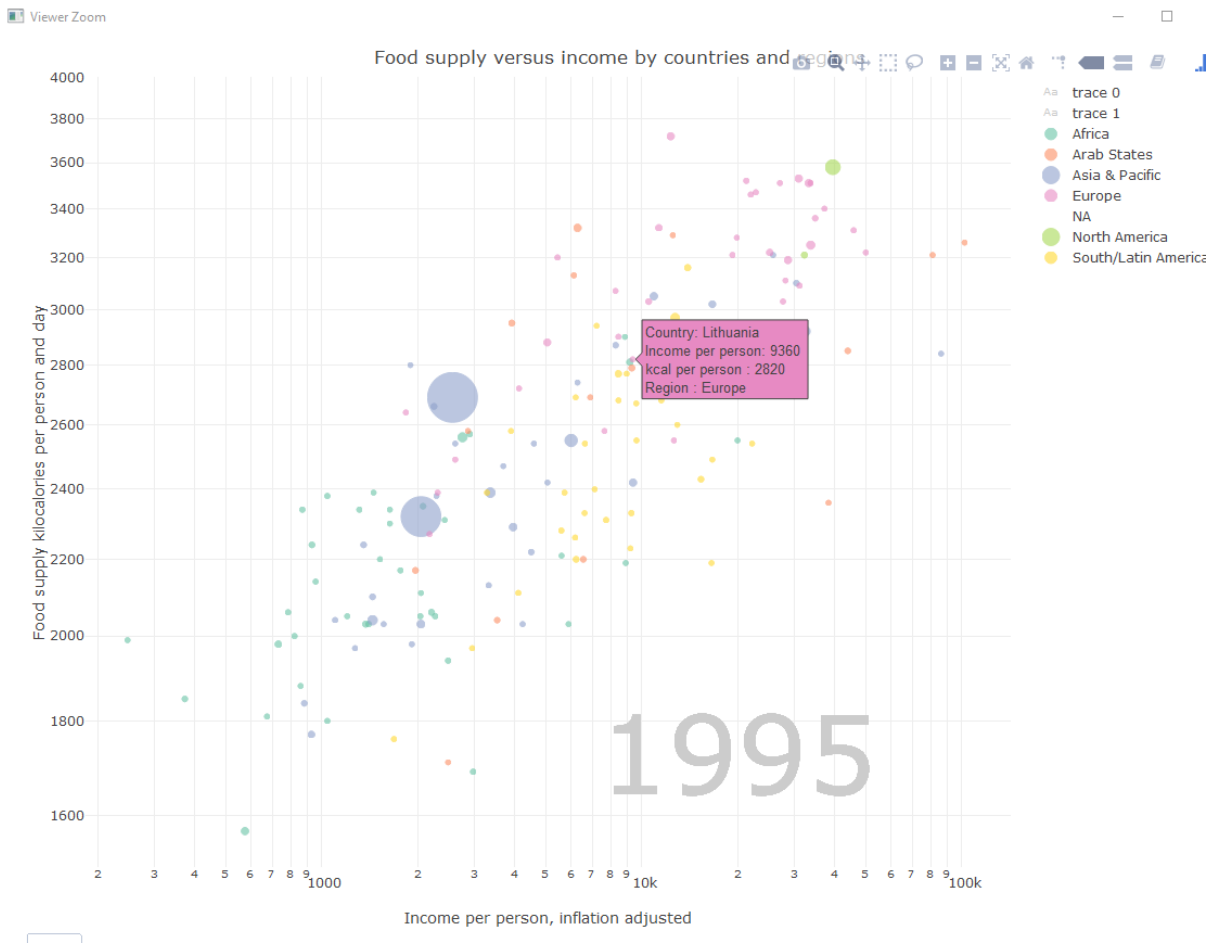
I decided to make a more complex scatterplot with bubbles that is showing dependence between Food supply and GDP per capita, using color to

differentiate region and bubble dimension for total population. When hovering other bubbles, there is more useful information. The scatterplot is limited to information for 2010.



As plotly provides a wide range of tools for animation, next is the similar scatterplot, but with information about years 1995-2010 in 2 variants: one for one layer animated scatterplot and for 2 layers scatterplot for better visualisation of year on the screen.

Every frame in them is defined by a year. Text for year is situated in the left bottom corner and animation has a frame rate of 1000 milliseconds, 300 of which are reserved for transition stage. The type of movement was used “back”



To use more possibilities of Plotly for animation and interactivity, I used library Crosstalk, that gives possibility to use a lot of tools that are used in Shiny, but without loading server.

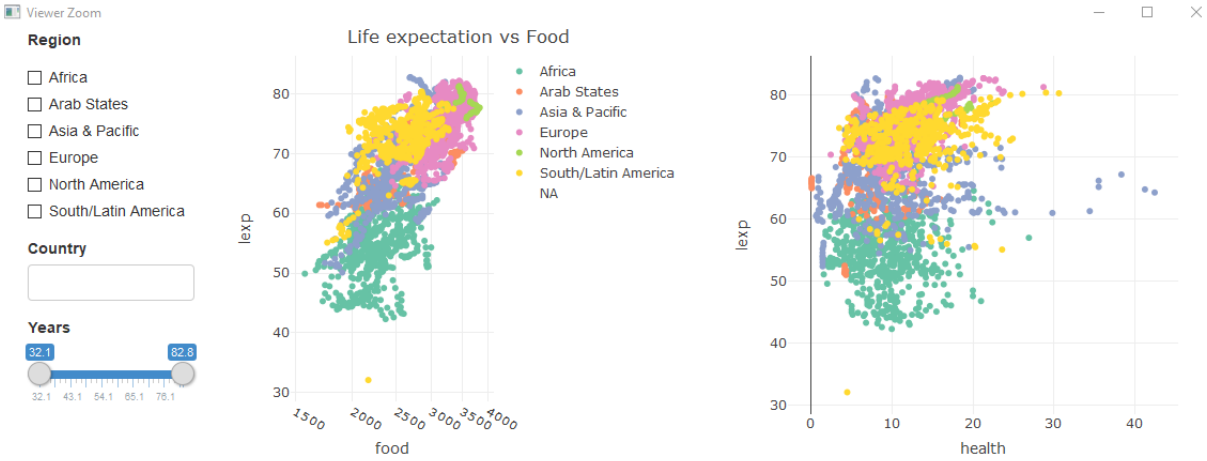
For this goal I generated 2 small scatterplots showing life expectancy vs food supply and government allocation for health.

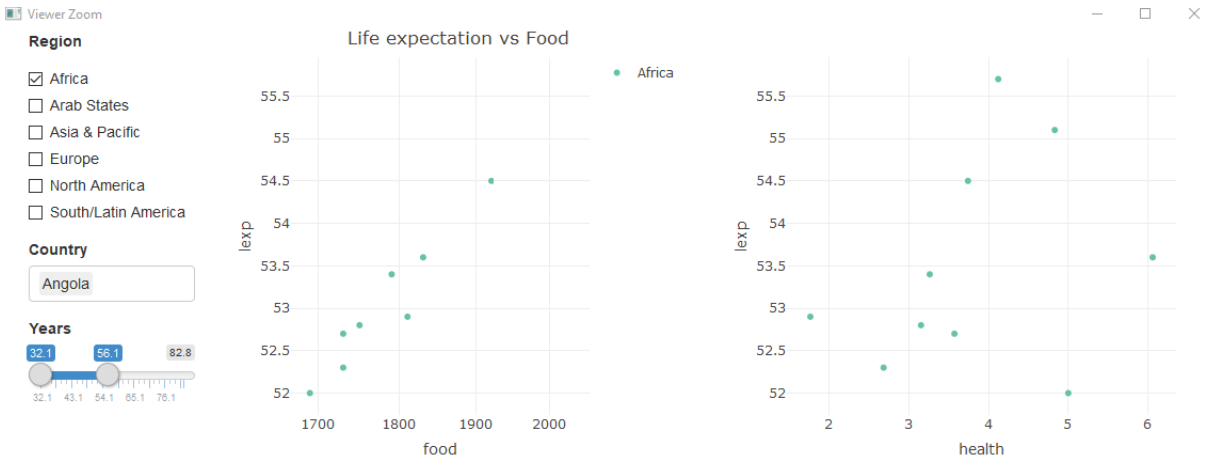
There are few combinations of these two plots with different tools as checkbox, select option and slider.

Use of function bscols gives possibility to select different options for both scatterplots and see more detailed chart.

In the following screenshot we can see a checkbox for region, a selective option for country and a slider for life expectancy.

Following screenshot show plots without any selection and with complete selection.



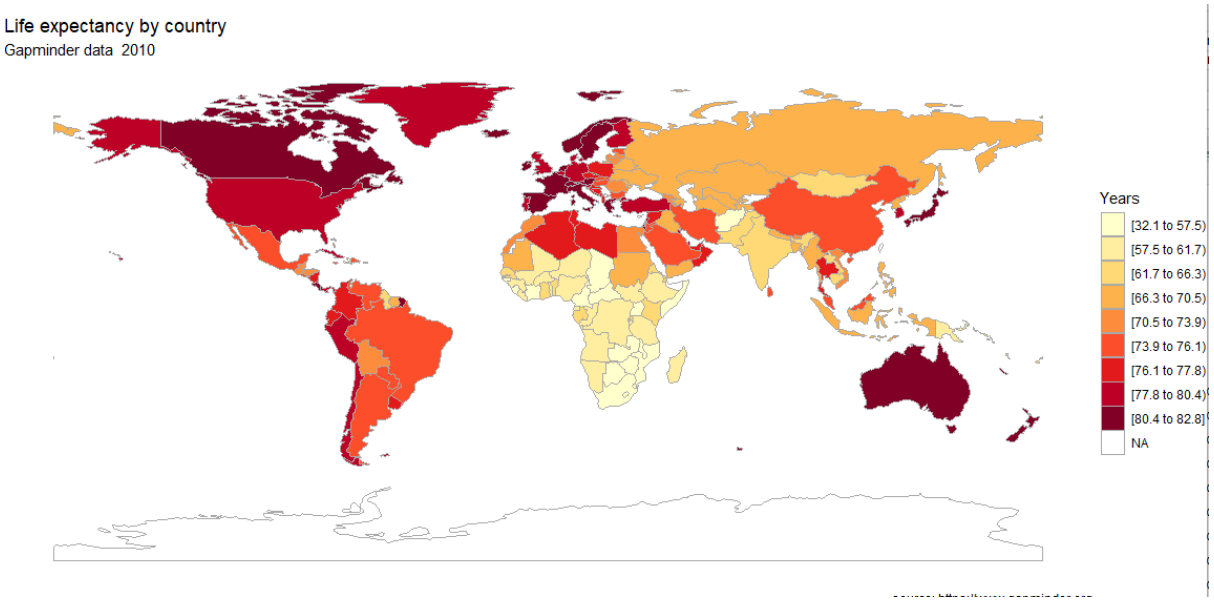


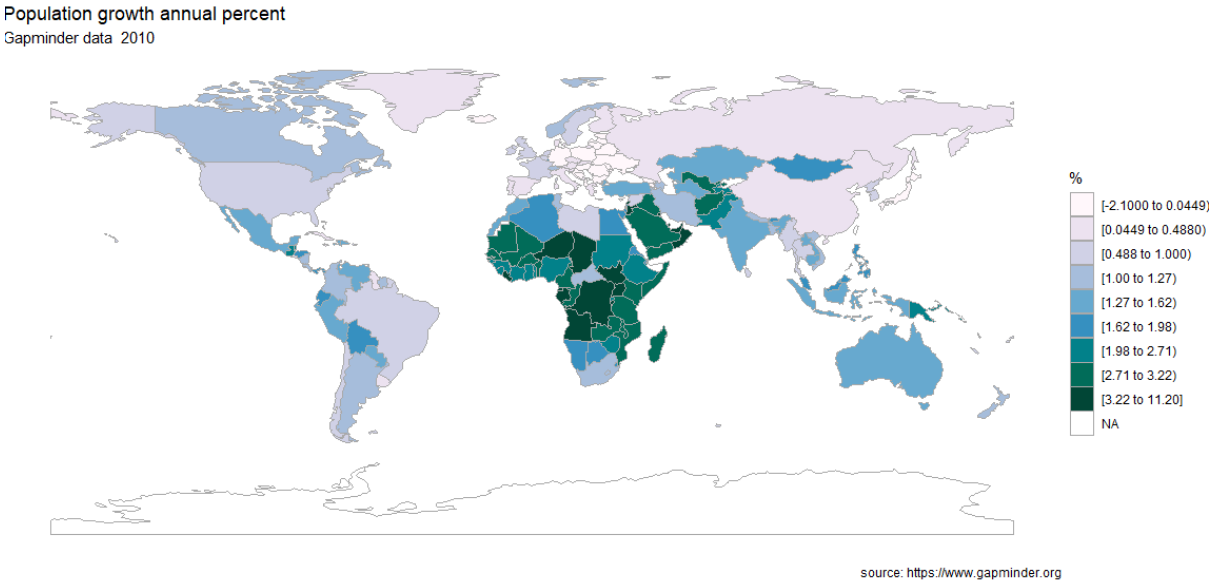
The same two scatterplots were used with function subplot to show possibility of hover over selection of one plot, that results in selection of the same data in the second scatterplot:

In the end I decided to use possibilities of another library: ChoroplerhrMaps.

I was fascinated by how in few lines of code it was possible to show different world maps with information from my dataset for 2010.

For example, below are 2 snapshots for map of high life expectancy and map of growth of population, that shows a very small increase in population for countries with high life expectancy. This visualises process of population aging in most of countries with high income per person.





In process of work on this assignment I didn't find a correlation between my information, but I used some tools of Plotly that gave me a moral satisfaction and desire to use these library in the future for more researches of tools and its possibilities.