W6\_Loops\_Functions

Jakub Raszka

26 10 2020

## Loading data, packages

## packages  
pacman::p\_load(ggplot2, tidyverse, gapminder, psych)  
  
## data  
gapminder <- gapminder

## 1: Function

Define a defensive function that calculates the Gross Domestic Product of a nation from the data available in the gapminder dataset. Using that function, calculate the GDP of Denmark in the following years: 1967, 1977, 1987, 1997, 2007, and 2017.

## defining function  
gdp\_calculator <- function(nation, year, population, gdp\_per\_capita){  
 GDP <- population \* gdp\_per\_capita  
   
 return(GDP)  
}  
  
## creating a dataframe of data only from Denmark and for desired years  
denmark\_7 <- gapminder %>%   
 filter(country == "Denmark") %>%   
 filter(grepl("\\d{2}[1,6,7,8,9,0]7", year))  
  
## upon close inspection, there is no data for year 2017!!  
  
## calculating gdp of country  
denmark\_7$gdp\_country <- gdp\_calculator(denmark\_7$country, denmark\_7$year, denmark\_7$pop, denmark\_7$gdpPercap)  
  
denmark\_7

## # A tibble: 5 x 7  
## country continent year lifeExp pop gdpPercap gdp\_country  
## <fct> <fct> <int> <dbl> <int> <dbl> <dbl>  
## 1 Denmark Europe 1967 73.0 4838800 15937. 77116977700.  
## 2 Denmark Europe 1977 74.7 5088419 20423. 103920280028.  
## 3 Denmark Europe 1987 74.8 5127024 25116. 128771236166.  
## 4 Denmark Europe 1997 76.1 5283663 29804. 157476118456.  
## 5 Denmark Europe 2007 78.3 5468120 35278. 192906627081.

## 2: Loop

Write a script that loops over each country in the gapminder dataset, tests whether the country starts with a ‘B’ , and print out whether the life expectancy is smaller than 50, between 50 and 70, or greater than 70.

## a loop prints whether a country name start with B or not, but what's the point??  
  
# creating a vector with unique country name (to prevent repetition)  
country\_name <- sort(unique(as.character(gapminder$country)), decreasing =F)  
  
# a loop   
## to prevent loops output to be too long, I restricted the conditon only to first 20 countries. However, it can be easily undone by deleting [1:20] after country name  
for (i in 1:length(country\_name[1:20])){  
   
 if(grepl("^B", country\_name[i]) == TRUE){  
 print(paste(country\_name[i], " starts with B."))  
 } else (print(paste(country\_name[i], " does not start with B.")))  
  
}

## [1] "Afghanistan does not start with B."  
## [1] "Albania does not start with B."  
## [1] "Algeria does not start with B."  
## [1] "Angola does not start with B."  
## [1] "Argentina does not start with B."  
## [1] "Australia does not start with B."  
## [1] "Austria does not start with B."  
## [1] "Bahrain starts with B."  
## [1] "Bangladesh starts with B."  
## [1] "Belgium starts with B."  
## [1] "Benin starts with B."  
## [1] "Bolivia starts with B."  
## [1] "Bosnia and Herzegovina starts with B."  
## [1] "Botswana starts with B."  
## [1] "Brazil starts with B."  
## [1] "Bulgaria starts with B."  
## [1] "Burkina Faso starts with B."  
## [1] "Burundi starts with B."  
## [1] "Cambodia does not start with B."  
## [1] "Cameroon does not start with B."

## creating an empty vector to store results  
gapminder$lifeexp\_task <- c("l")  
  
  
## printing a message in what range life expectancy is  
  
for (i in 1:nrow(gapminder)){  
   
 if(gapminder$lifeExp[i]< 50){  
   
 gapminder$lifeexp\_task[i] <- "The life expectancy is smaller than 50"  
   
 } else if (gapminder$lifeExp[i]>= 50 & gapminder$lifeExp[i] <= 70){  
   
 gapminder$lifeexp\_task[i] <- "The life expectancy is between 50 and 70."  
   
 } else(gapminder$lifeexp\_task[i] <- "The life expectancy is larger than 70.")  
  
}  
  
gapminder[10:20,c(4,7)]

## # A tibble: 11 x 2  
## lifeExp lifeexp\_task   
## <dbl> <chr>   
## 1 41.8 The life expectancy is smaller than 50   
## 2 42.1 The life expectancy is smaller than 50   
## 3 43.8 The life expectancy is smaller than 50   
## 4 55.2 The life expectancy is between 50 and 70.  
## 5 59.3 The life expectancy is between 50 and 70.  
## 6 64.8 The life expectancy is between 50 and 70.  
## 7 66.2 The life expectancy is between 50 and 70.  
## 8 67.7 The life expectancy is between 50 and 70.  
## 9 68.9 The life expectancy is between 50 and 70.  
## 10 70.4 The life expectancy is larger than 70.   
## 11 72 The life expectancy is larger than 70.