Assignment_6_functions_loops

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Set working directory

As a standard I always start out by setting my working directory to the current folder:

```
#Setting working directory
setwd("/Users/matilde/Desktop/AU/Cultural Data Science/R/CDS2020_1")
```

Get the necessary packages

First, start with installing the relevant packages 'tidyverse', 'gganimate', and 'gapminder'.

#Question 1 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.

```
# Takes a dataset and multiplies the population column
# with the GDP per capita column.
calcGDP <- function(dat, year=NULL, country=NULL) {
  if(!is.null(year)) {
    dat <- dat[dat$year %in% year, ]
  }
  if (!is.null(country)) {
    dat <- dat[dat$country %in% country,]
  }
  gdp <- dat$gdpPercap * dat$pop

  new <- cbind(dat, gdp=gdp)
  return(new)
}

#Defining list of years to calculate
years <- c(1967, 1977, 1987, 1997, 2007, 2017)

#Using the values wanted
calcGDP(gapminder, years, "Denmark")
```

```
##   country continent year lifeExp     pop gdpPercap          gdp
## 1 Denmark    Europe 1967  72.960 4838800  15937.21  77116977700
## 2 Denmark    Europe 1977  74.690 5088419  20422.90 103920280028
## 3 Denmark    Europe 1987  74.800 5127024  25116.18 128771236166
## 4 Denmark    Europe 1997  76.110 5283663  29804.35 157476118456
## 5 Denmark    Europe 2007  78.332 5468120  35278.42 192906627081
```

#Question 2 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.

```r
#Creating a dataframe with only countries strartng with "B"
gapminder <- as.data.frame(gapminder)
candidateCountries <- grep("^B", unique(gapminder$country), value=TRUE)

#Looping over those countries and return message about life expectancy
#Strat by defining threshhold
lowerThreshold <- 50
upperThreshold <- 70
#Writing the loop
for (iCountry in candidateCountries) {
  tmp <- mean(gapminder[gapminder$country == iCountry, "lifeExp"])
  if(tmp >= 70){
    print(paste("Average Life Expectancy in", iCountry, "is equal to or larger than")) }
  else if (tmp>=50) {
   print(paste("Average Life Expectancy in", iCountry, "is between 50 and 70 years"))}
  else { print(paste("Average Life Expectancy in", iCountry, "is smaller than 50"))
  }}
```

```
## [1] "Average Life Expectancy in Bahrain is between 50 and 70 years"
## [1] "Average Life Expectancy in Bangladesh is smaller than 50"
## [1] "Average Life Expectancy in Belgium is equal to or larger than"
## [1] "Average Life Expectancy in Benin is smaller than 50"
## [1] "Average Life Expectancy in Bolivia is between 50 and 70 years"
## [1] "Average Life Expectancy in Bosnia and Herzegovina is between 50 and 70 years"
## [1] "Average Life Expectancy in Botswana is between 50 and 70 years"
## [1] "Average Life Expectancy in Brazil is between 50 and 70 years"
## [1] "Average Life Expectancy in Bulgaria is between 50 and 70 years"
## [1] "Average Life Expectancy in Burkina Faso is smaller than 50"
## [1] "Average Life Expectancy in Burundi is smaller than 50"
```

#Question 3 Optional: Write a script that loops over each country in the gapminder dataset, tests whether the country starts with a 'M' and graphs life expectancy against time (using plot() function) as a line graph if the mean life expectancy is under 50 years.