homework_w43_functions_with_gapminder

EOL

2022-10-31

```
# inspect data
ls.str(df)
```

```
## continent :  Factor w/ 5 levels "Africa","Americas",..: 3 3 3 3 3 3 3 3 3 3 ...
## country :  Factor w/ 142 levels "Afghanistan",..: 1 1 1 1 1 1 1 1 1 1 ...
## gdpPercap :  num [1:1704] 779 821 853 836 740 ...
## lifeExp :  num [1:1704] 28.8 30.3 32 34 36.1 ...
## pop :  int [1:1704] 8425333 9240934 10267083 11537966 13079460 14880372 12881816 13867957 16317921 2
## year :  int [1:1704] 1952 1957 1962 1967 1972 1977 1982 1987 1992 1997 ...
```

```
sum(is.na(df)) # if output is 0 it means no missing values
```

```
## [1] 0
```

Use the gapminder dataset from Week 43 to produce solutions to the three tasks below. Post the .R script or .Rmd and .html in your au##### github repository and link it here: https://github.com/Digital-Methods-HASS/au650627_olsen_emma

1) Define a defensive function that calculates the Gross Domestic Product of a nation from the data available in the gapminder dataset.

You can use the population and GDPpercapita columns for it. Using that function, calculate the GDP of Denmark in the following years: 1967, 1977, 1987, 1997, 2007, and 2017.

```
gdp_func <- function(df, year, country) {
  nation_data = df[which(df$year == year & df$country==country),]
  gdp = (nation_data$gdpPercap * nation_data$pop)
  print(paste(country,"did in year", year, "have a GDP of", gdp))
    }
```

```
dk_years <- c(1967, 1977, 1987, 1997, 2007, 2017)

for (i in 1:length(dk_years)){
  gdp_func(df,year=dk_years[i], country="Denmark")
}
```

```
## [1] "Denmark did in year 1967 have a GDP of 77116977699.724"
## [1] "Denmark did in year 1977 have a GDP of 103920280027.729"
## [1] "Denmark did in year 1987 have a GDP of 128771236166.089"
```

```
## [1] "Denmark did in year 1997 have a GDP of 157476118455.789"
## [1] "Denmark did in year 2007 have a GDP of 192906627080.569"
## [1] "Denmark did in year 2017 have a GDP of "
```

The output above shows the GDP of Denmark in the years 1967, 1977, 1987, 1997, 2007, 2017. The function still runs although it has been given a year not present in the dataset (there was no data from Denmark in year 2017). However, the output is empty as it was not possible to calculated this value. It could be predicted based on previous trends but not calculated on the basis of the dataset at hand.

2) Write a script that loops over each country in the gapminder dataset, tests whether the country starts with a 'B' , and prints out whether the life expectancy is smaller than 50, between 50 and 70, or greater than 70. (Hint: remember the grepl function, and review the Control Flow tutorial)

```
for (i in 1:nrow(df)) {
   if(grepl("^B", df$country[i])){ # grepl func sets value to TRUE if country starts with B (and contin
    if (df$lifeExp[i] < 50 ){ # life expectancy below 50
      text = "below 50"}

     else if (df$lifeExp[i] >= 50 & df$lifeExp[i] <= 70){
      text = " between 50 and 70"}

     else if (df$lifeExp[i] > 70){
      text = "grather than 70"}

     msg = paste0(df$country[i], "'s life expectancy is ", text)
     print(msg)

     }}
```

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## [1] "Bahrain's life expectancy is  between 50 and 70"
## [1] "Bahrain's life expectancy is  between 50 and 70"
## [1] "Bahrain's life expectancy is  between 50 and 70"
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