w6_assignment

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Loading packages

```
library(pacman)
p_load(tidyverse, gganimate, gapminder, gifski, png, readr)
```

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.

```
# Inspecting data
head(gapminder)
```

```
## # A tibble: 6 x 6
##   country     continent  year lifeExp      pop gdpPercap
##   <fct>       <fct>     <int>   <dbl>    <int>     <dbl>
## 1 Afghanistan Asia       1952    28.8  8425333      779.
## 2 Afghanistan Asia       1957    30.3  9240934      821.
## 3 Afghanistan Asia       1962    32.0 10267083      853.
## 4 Afghanistan Asia       1967    34.0 11537966      836.
## 5 Afghanistan Asia       1972    36.1 13079460      740.
## 6 Afghanistan Asia       1977    38.4 14880372      786.
```

```
# Defining function for calculating GDP

gdp_function <- function(nation, time){
  this_subset <- gapminder %>%
  subset(country == nation & year == time)

  if (!is.numeric(this_subset$pop)) {
    stop("pop must be a numeric vector.")
  }
  if (!is.numeric(this_subset$gdpPercap)) {
    stop("gdpPercap must be a numeric vector.")
  }

  this_subset <- this_subset %>% mutate(pop*gdpPercap)
  GDP <- this_subset$`pop * gdpPercap`[1]

  return(GDP)
}

# Calculating GDP in Denmark during the years 1967, 1977, 1987, 1997, 2007, and
2017
gdp_function('Denmark', 1967)

## [1] 77116977700

gdp_function('Denmark', 1977)

## [1] 103920280028

gdp_function('Denmark', 1987)

## [1] 128771236166

gdp_function('Denmark', 1997)

## [1] 157476118456

gdp_function('Denmark', 2007)

## [1] 192906627081

gdp_function('Denmark', 2017)

## [1] NA
```

In order to calculate the GDP of a nation, we can use the information provided by data set on the population and GDP per capita for each nation per year. By multiplying the 'gdpPercap' column with the 'pop' column, we get the GDP of the nation for that year. This is then put into a function and applied to Denmark for the relevant years. The results can be seen above.

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.

```
B_df <- as.data.frame(matrix(0, nrow = 1, ncol = 8))  #new df to be filled with
data from loop
colnames(B_df) <- c(colnames(gapminder), "starts_with_B", "range_life_exp")

for (i in gapminder$country){ #looping through countries
  current_subset <- gapminder %>%
    subset(country == i)
  for (j in current_subset$year){ #looping through years for that country
    new_current_subset <- current_subset %>%
    subset(year == j)

    new_current_subset$starts_with_B <- startsWith('B', i) #returns TRUE in new
colum if country starts with B

    #determining size of life exp and adding this info to new column
    if (new_current_subset$lifeExp < 50){
      new_current_subset$range_life_exp <- "smaller than 50"
    }
    if (new_current_subset$lifeExp >= 50 & new_current_subset$lifeExp <= 70){
      new_current_subset$range_life_exp <- "between 50 and 70"
    }
    if (new_current_subset$lifeExp > 70){
      new_current_subset$range_life_exp <- "greater than 70"
    }

    B_df <- rbind(B_df, new_current_subset) #binding to B_df for each iteration of
the loop
  }
}
head(B_df[,-2])
```

```
##       country year lifeExp      pop gdpPercap starts_with_B  range_life_exp
## 1           0    0   0.000        0    0.0000             0               0
## 2 Afghanistan 1952  28.801  8425333  779.4453             0 smaller than 50
## 3 Afghanistan 1957  30.332  9240934  820.8530             0 smaller than 50
## 4 Afghanistan 1962  31.997 10267083  853.1007             0 smaller than 50
## 5 Afghanistan 1967  34.020 11537966  836.1971             0 smaller than 50
## 6 Afghanistan 1972  36.088 13079460  739.9811             0 smaller than 50
```

This loop returns a dataframe with information on every country for each year about the range of the lifeExp and whether country starts with 'B'.