Lab 3

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Ex 1.0: Loading libraries

```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --
```

```
## v ggplot2 3.3.5     v purrr   0.3.4
## v tibble  3.1.6     v dplyr   1.0.7
## v tidyr   1.1.4     v stringr 1.4.0
## v readr   2.1.1     v forcats 0.5.1
```

```
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(gapminder)
```

Ex 1.1 : Three countries in 1970's

```
gapminder |>
  filter(country == "Nigeria"| country == "Ghana"| country == "Senegal") |>
  filter(year >= 1970 & year <=1979)
```

```
## # A tibble: 6 x 6
##    country continent  year lifeExp      pop gdpPercap
##    <fct>   <fct>     <int>  <dbl>    <int>     <dbl>
## 1 Ghana   Africa     1972   49.9  9354120     1178.
## 2 Ghana   Africa     1977   51.8 10538093      993.
## 3 Nigeria Africa     1972   42.8 53740085     1698.
## 4 Nigeria Africa     1977   44.5 62209173     1982.
## 5 Senegal Africa     1972   45.8  4588696     1598.
## 6 Senegal Africa     1977   48.9  5260855     1562.
```

Ex 1.2 : Three countries in 1970's with respective GDP Per Capita

```
gapminder |> filter(country == "Nigeria"| country == "Ghana"| country == "Senegal") |>
  filter(year >= 1970 & year <=1979) |>
  select(country, gdpPercap)
```

```
## # A tibble: 6 x 2
##   country gdpPercap
##   <fct>       <dbl>
## 1 Ghana       1178.
## 2 Ghana        993.
## 3 Nigeria     1698.
## 4 Nigeria     1982.
## 5 Senegal     1598.
## 6 Senegal     1562.
```

Ex 1.3: Changes in life expectancy by country

```
lifechanged <-  gapminder|>
  arrange(country) |>
  mutate(lifeChange = lifeExp - lag(lifeExp))  |> filter(lifeChange < 0)
```

Ex 1.4: Maximum GDP per capita experienced by each country

```
gapminder |>
  arrange(country) |>
  group_by(country) |>
  filter(gdpPercap==max(gdpPercap))
```

```
## # A tibble: 142 x 6
## # Groups:   country [142]
##     country      continent  year lifeExp       pop gdpPercap
##     <fct>        <fct>     <int>   <dbl>     <int>     <dbl>
##  1 Afghanistan  Asia       1982    39.9  12881816      978.
##  2 Albania      Europe     2007    76.4   3600523     5937.
##  3 Algeria      Africa     2007    72.3  33333216     6223.
##  4 Angola       Africa     1967    36.0   5247469     5523.
##  5 Argentina    Americas   2007    75.3  40301927    12779.
##  6 Australia    Oceania    2007    81.2  20434176    34435.
##  7 Austria      Europe     2007    79.8   8199783    36126.
##  8 Bahrain      Asia       2007    75.6    708573    29796.
##  9 Bangladesh   Asia       2007    64.1 150448339     1391.
## 10 Belgium      Europe     2007    79.4  10392226    33693.
## # ... with 132 more rows
```

Ex 1.5 Scatterplot of Canada's life expectance vs GDP Per Capita

```
gapminder |>filter(country=="Canada") |>
  ggplot(aes(y = lifeExp, x = gdpPercap, size = gdpPercap)) +
  geom_point() +
  scale_x_continuous(
    name = "GDP per capita",
    trans = "log10",
    labels = scales::dollar_format()) +
  labs(y = "Life Expectancy",
       title = "Scatterplot of Life Expectancy and GDP Per Capita for Canada")
```

Scatterplot of Life Expectancy and GDP Per Capita for Canada
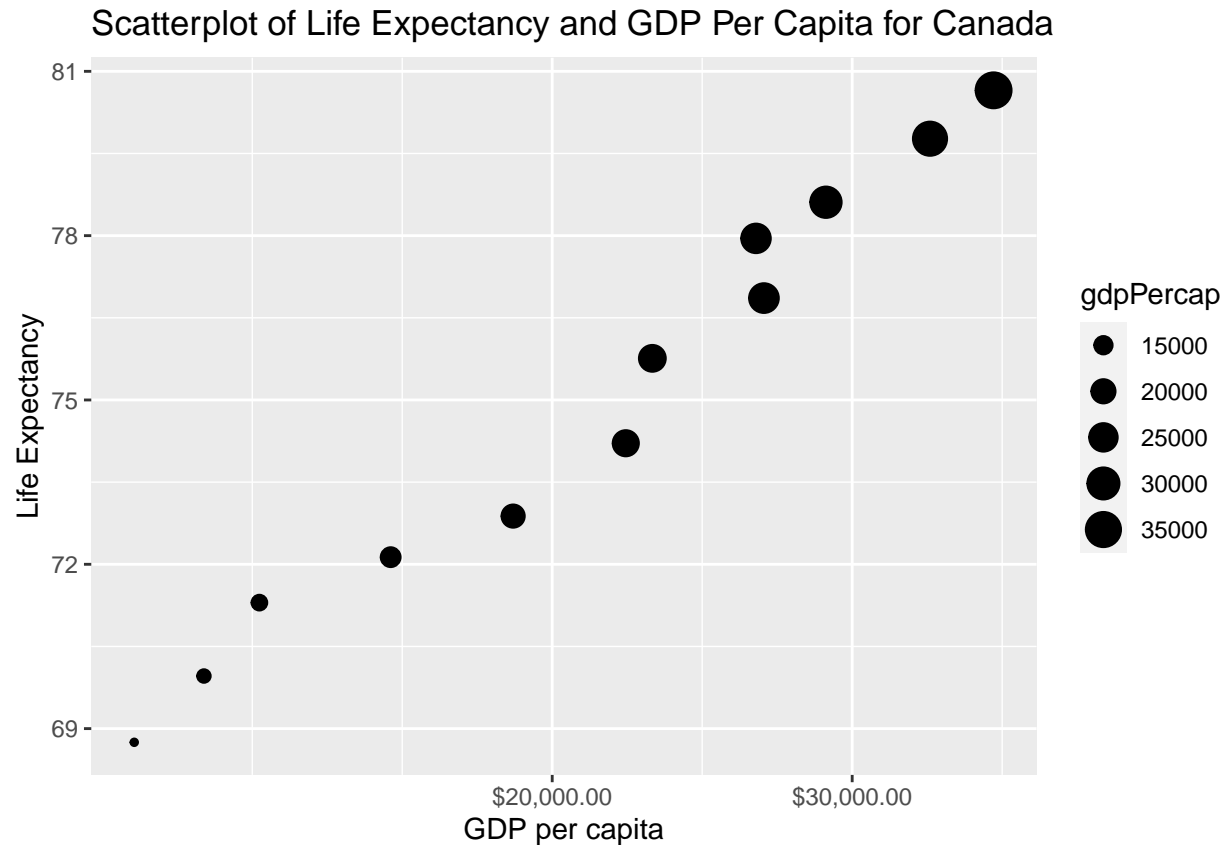
Ex 2.1 Exploring Palmerpenguins using dplyr and ggplot

```
library(palmerpenguins)

penguins |>
  group_by(species) |>
  summarise(bill_length_mean = mean(bill_length_mm, na.rm = T),
            body_mass_mean = mean(body_mass_g, na.rm = T),
            bill_length_sd = sd(bill_length_mm, na.rm = T),
            body_mass_sd = sd(body_mass_g, na.rm = T))
```

```
## # A tibble: 3 x 5
##   species   bill_length_mean body_mass_mean bill_length_sd body_mass_sd
##   <fct>                <dbl>          <dbl>          <dbl>        <dbl>
## 1 Adelie                38.8          3701.           2.66         459.
## 2 Chinstrap             48.8          3733.           3.34         384.
## 3 Gentoo                47.5          5076.           3.08         504.
```

```
penguins |> ggplot(aes( x =  body_mass_g, y=  bill_length_mm)) +
  geom_point(aes(color =species))+
  geom_smooth() +
  labs(x = "Body mass",
       y = "Bill length",
       title = "Scatterplot of Body mass and Bill length for Penguins")
```

Scatterplot of Body mass and Bill length for Penguins