Exploring Gapminder and using `dplyr`

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Contents

Exercise 1: Basic `dplyr`

Filter

```
three_countries <- filter(gapminder, country == c("Hong Kong, China","Canada","Korea, Rep."))

three_countries %>% kable()
```

country	continent	year	lifeExp	pop	gdpPercap
Canada	Americas	1957	69.960	17010154	12489.950
Canada	Americas	1972	72.880	22284500	18970.571
Canada	Americas	1987	76.860	26549700	26626.515
Canada	Americas	2002	79.770	31902268	33328.965
Hong Kong, China	Asia	1952	60.960	2125900	3054.421
Hong Kong, China	Asia	1967	70.000	3722800	6197.963
Hong Kong, China	Asia	1982	75.450	5264500	14560.531
Hong Kong, China	Asia	1997	80.000	6495918	28377.632
Korea, Rep.	Asia	1962	55.292	26420307	1536.344
Korea, Rep.	Asia	1977	64.766	36436000	4657.221
Korea, Rep.	Asia	1992	72.244	43805450	12104.279
Korea, Rep.	Asia	2007	78.623	49044790	23348.140

Pipe

```
gdp_dat <- three_countries %>% select(country, gdpPercap)
```

Countries with a drop in life expectancy

All countries that have experienced a drop in life expectancy.

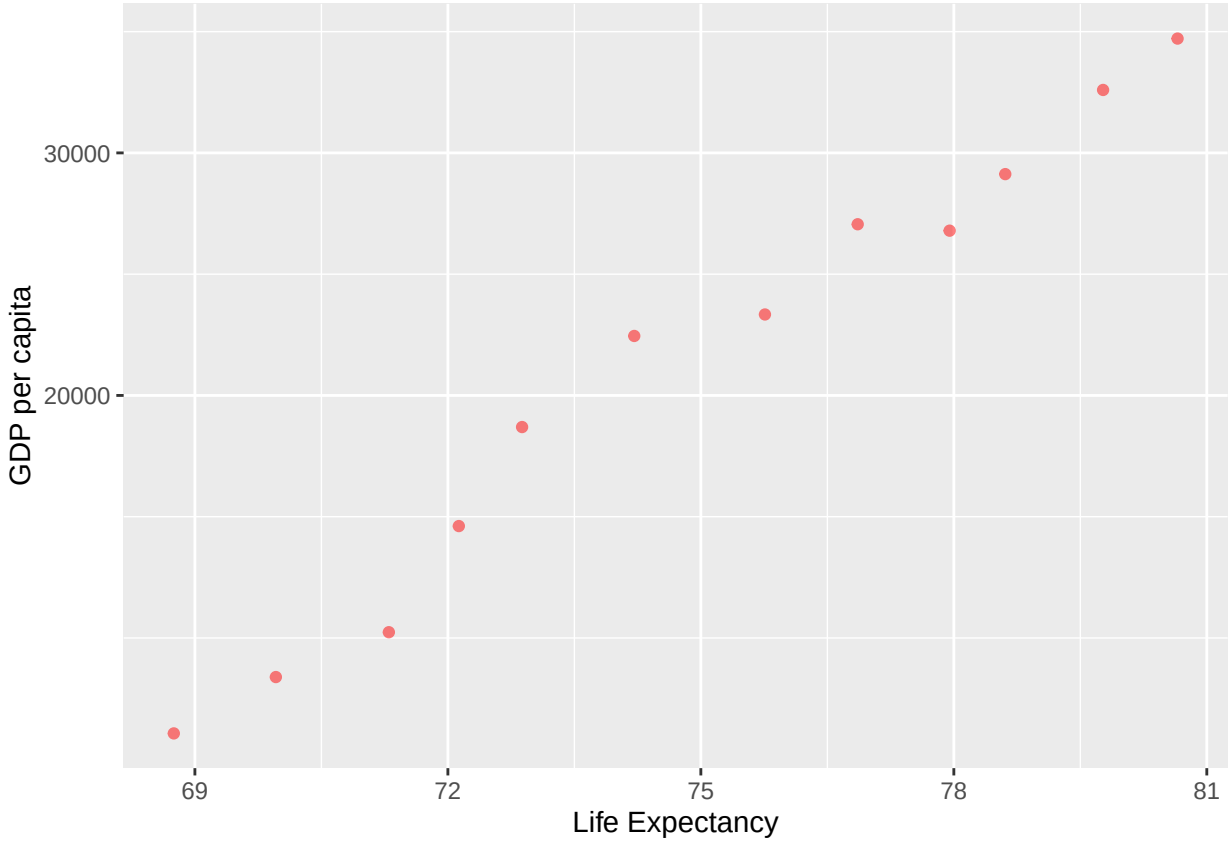
```
gapminder_lifeExpChange <- gapminder %>%  group_by(country) %>% mutate(lifeExpChange = lifeExp - lag(li

gapminder_lifeExpChange %>% filter( lifeExpChange < 0) %>%  select(country,continent,year,lifeExp,lifeE
```

Max GDP per capita

```
gapminder %>% group_by(country) %>% mutate(max_gdpPercap = max(gdpPercap)) %>% filter(gdpPercap == max_
```

Canada's life expectancy vs. GDP per capita

```
gapminder %>% filter(country=="Canada") %>% ggplot(aes(lifeExp,gdpPercap)) + geom_point(alpha = 0.5, co
```



Exercise 2: Explore inidividual variables with `dplyr`

Quantitative variable

Possible values

```
range <-gapminder %>% select(gdpPercap) %>% range()
print(range)
```

```
## [1]    241.1659 113523.1329
```

```
mingdp <- range[1]
maxgdp <- range[2]
```

This tells us that minimum value of gdpPercap is 241.1659 and the maximum is 113523.1329. Let's find the corresponding countries.

```
gapminder %>% select(country, year,gdpPercap) %>% filter(gdpPercap == mingdp) %>% kable()
```

country	year	gdpPercap
Congo, Dem. Rep.	2002	241.1659
Congo is the countr	y that	recorded the minimum gdpPercap.

```
gapminder %>% select(country, year,gdpPercap) %>% filter(gdpPercap == maxgdp) %>% kable()
```

country	year	gdpPercap
Kuwait	1957	113523.1
Congo is t	he coun	try that recorded the minimum gdpPercap.

Typical values / Spread of data / Distribution

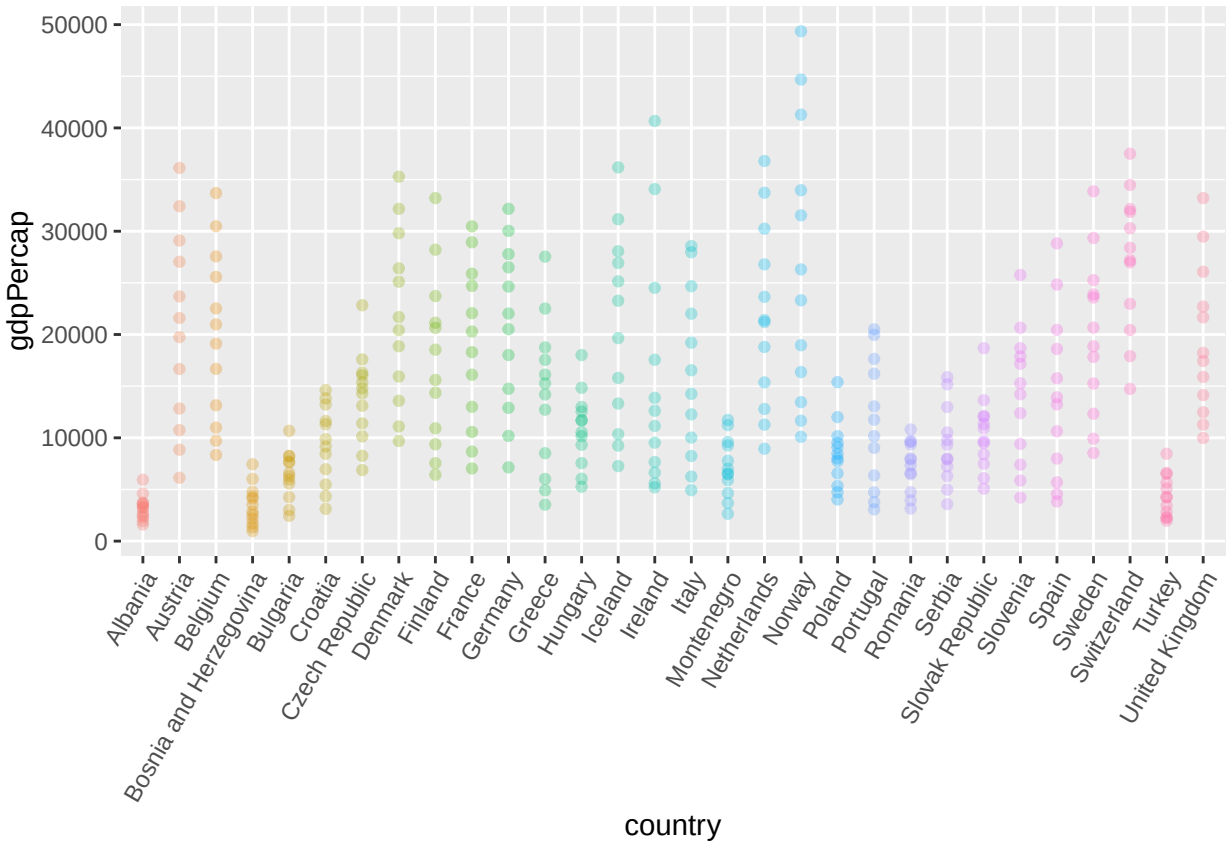
Let's get a statistical summary of life expectancy, popularion and gdp per capita for Europe:

```
gapminder %>%filter(continent=="Europe") %>% select(lifeExp,pop,gdpPercap) %>% summary() %>% kable()
```

lifeExp	pop	gdpPercap
Min. :43.59	Min. : 147962	Min. : 973.5
1st Qu.:69.57	1st Qu.: 4331500	1st Qu.: 7213.1
Median :72.24	Median : 8551125	Median :12081.8
Mean :71.90	Mean :17169765	Mean :14469.5
3rd Qu.:75.45	3rd Qu.:21802867	3rd Qu.:20461.4
Max. :81.76	Max. :82400996	Max. :49357.2

The distribution of gdpPercap across all the countries in Europe:

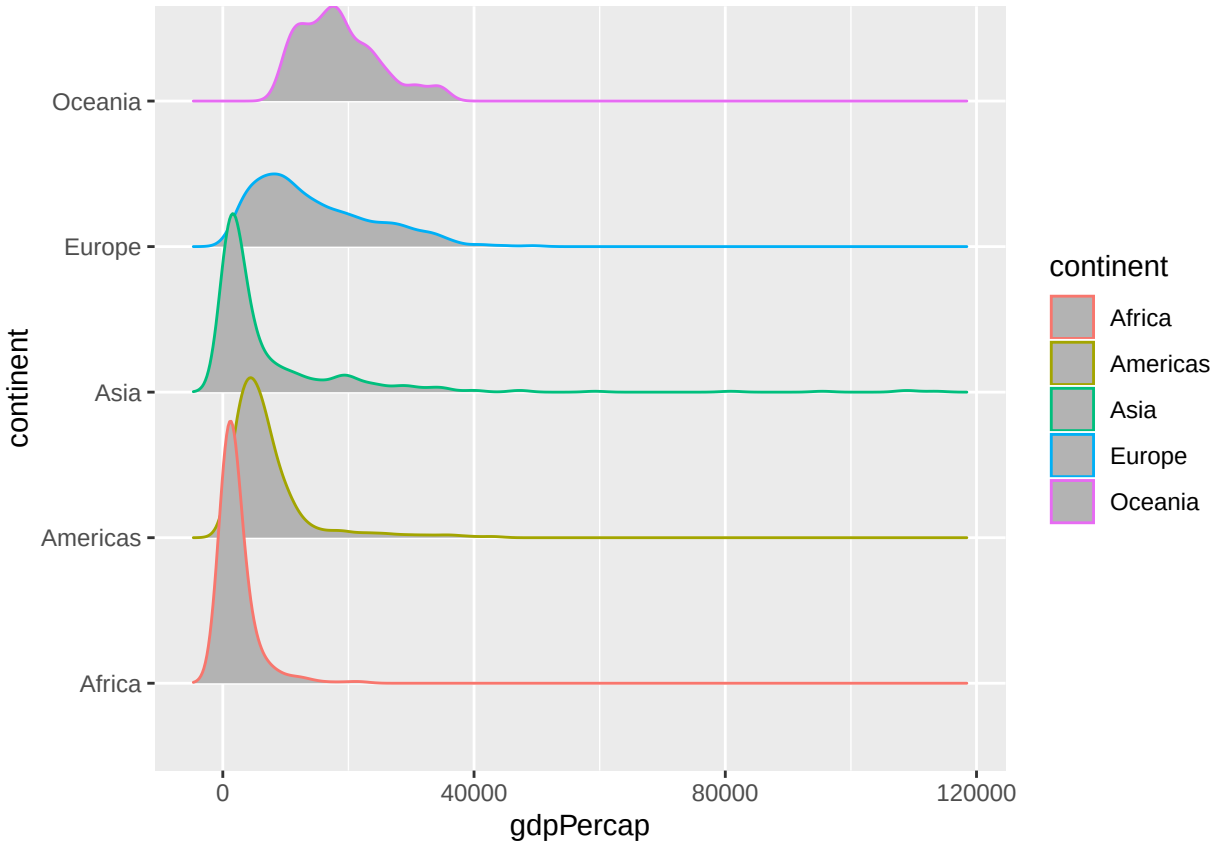
```
gapminder %>% filter(continent=="Europe") %>% ggplot(aes(country,gdpPercap, color = country)) + geom_po
```



The following plots the density estimates of gdp per capita for each continent (estimates the underlying distribution of the data).

```
ggplot(gapminder, aes(gdpPercap, continent, color = continent)) +
  ggridges::geom_density_ridges(bins = 50)
```

```
## Picking joint bandwidth of 1650
```



Categorical variable

```
library(datasets)
```

We will use a different data set to explore a categorical variable. Let's explore cut variable

```
diamonds <- as_tibble(diamonds)
```

Possible values of the variable

```
cut_unique <- diamonds %>% select(cut) %>% unique()
cut_unique %>% kable()
```

cut
Ideal
Premium
Good
Very Good
Fair

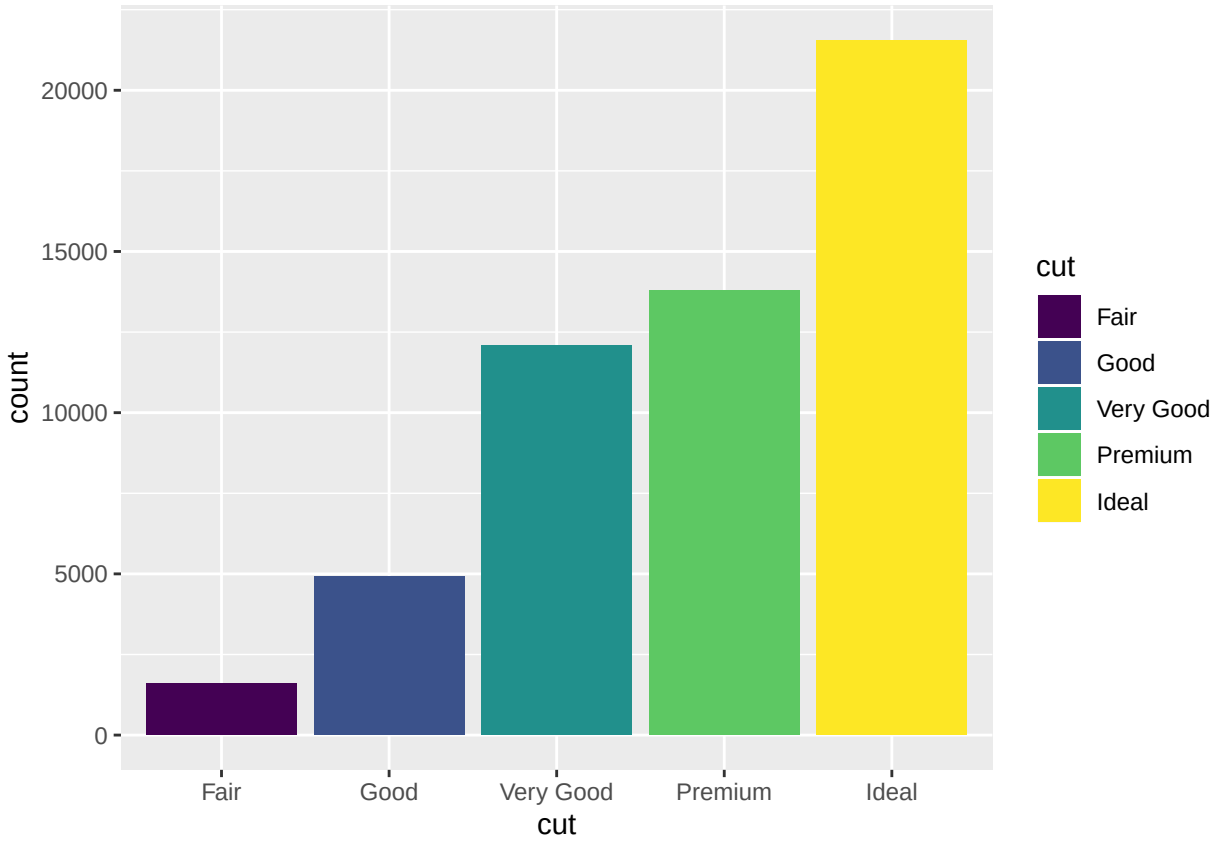
Typical values / Spread of data / Distribution

```
diamonds %>% count(cut) %>% kable()
```

cut	n
Fair	1610
Good	4906
Very Good	12082
Premium	13791
Ideal	21551

We can plot this count data:

```
diamonds %>%  ggplot(aes(cut,fill = cut)) + geom_bar()
```



We see that a 'fair' cut diamond is very rare, and 'ideal' cut is the most common one.

More plots

Exploring the country with biggest drop in 10 years and plot it over the years.

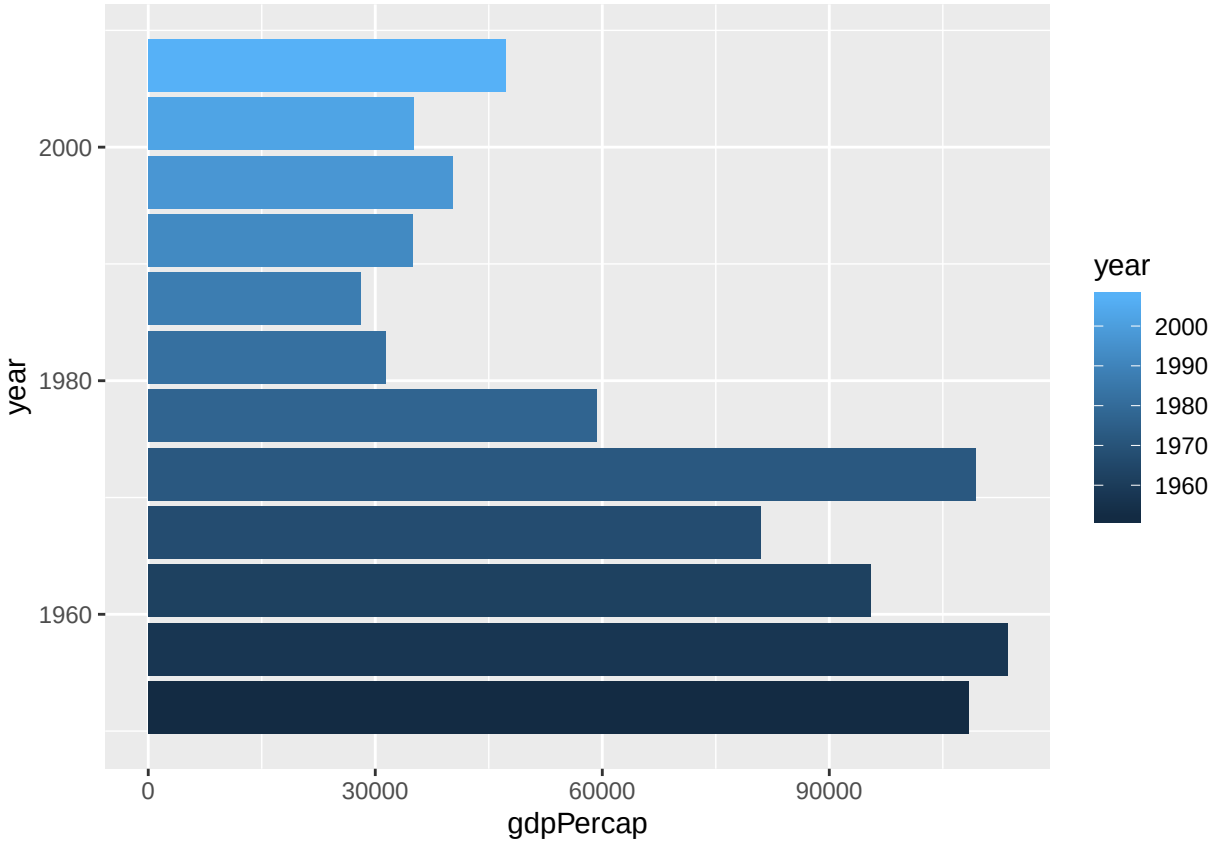
```
gapminder %>% group_by(country) %>% arrange(year) %>% mutate(dec_gdpPercap=difference(gdpPercap,2)) %>%
```

country	continent	year	gdpPercap	dec_gdpPercap
Kuwait	Asia	1982	31354.036	-77993.8313
Libya	Africa	1987	11770.590	-10180.6220
Serbia	Europe	1997	7914.320	-7956.5582
Venezuela	Americas	1987	9883.585	-3260.3663
New Zealand	Oceania	1992	18363.325	730.9145

Kuwait recorded the biggest drop of GDP in 10 years. Let's see what happened over the years in Kuwait.

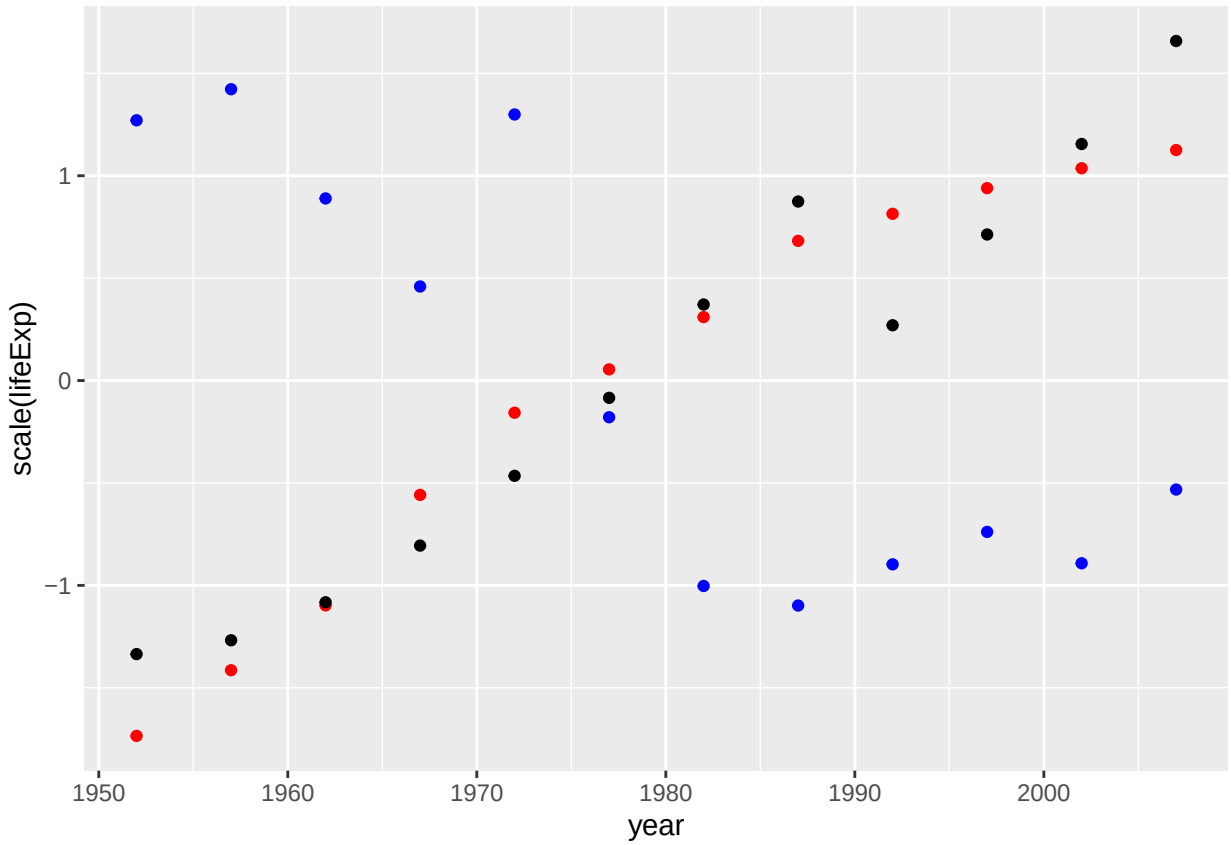
```
gapminder %>% filter(country=="Kuwait") %>% ggplot(aes(year, gdpPercap,fill=year)) + geom_col(stat="ide
```

```
## Warning: Ignoring unknown parameters: stat
```



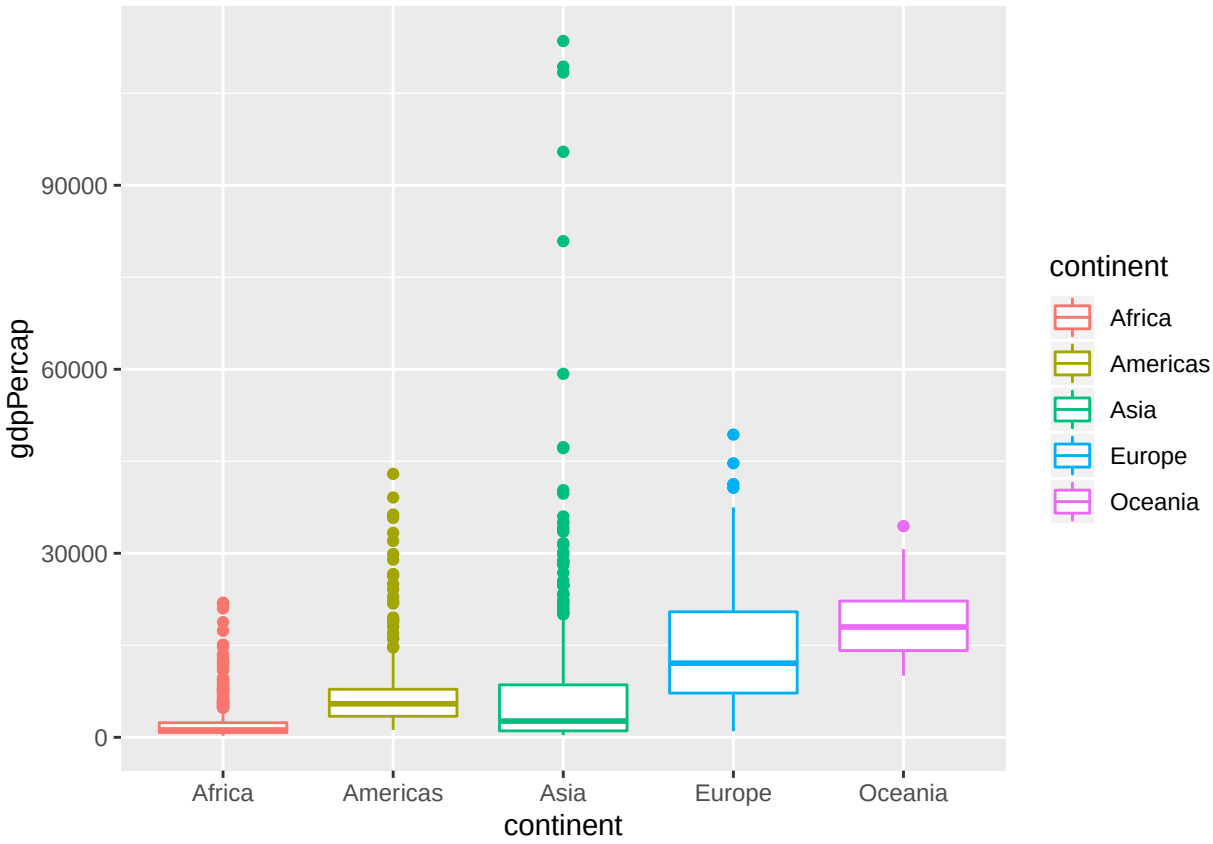
There seemed to have been a huge boom around 1960's but in the 2000's it dratically decreased. Could there have been some other factors that came into play?

```
gapminder %>% filter(country=="Kuwait") %>% ggplot(aes(x = year)) + geom_point(aes(y=scale(lifeExp)), c
```



It seems as though gdp per capita has an inverse relationship with the population and life expectancy in Kuwait.

```
gapminder %>% ggplot(aes(continent,gdpPercap, color = continent)) + geom_boxplot()
```



We see that Asia has the most fluctuations in gdpPercap.