

# BIOS 721 Midterm

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## Question 1

```
library(gapminder)
library(tidyverse)
library(knitr)
library(viridis)
library(wesanderson)
gap<-gapminder

table1<-gap%>%
  filter(year==2002|year==2007)%>%
  group_by(continent)%>%
  summarise(median_lifeExp=median(lifeExp))%>%
  arrange(median_lifeExp)

kable(table1,caption = "# The median life expectancy in the 2000s (years 2002 and 2007)",align = "c",col.names = c("Continent","Median Life Expectancy"))
```

*# The median life expectancy in the 2000s (years 2002 and 2007)*

Continent	Median Life Expectancy
Africa	52.4060
Asia	71.6570
Americas	72.8275
Europe	78.1770
Oceania	80.2870

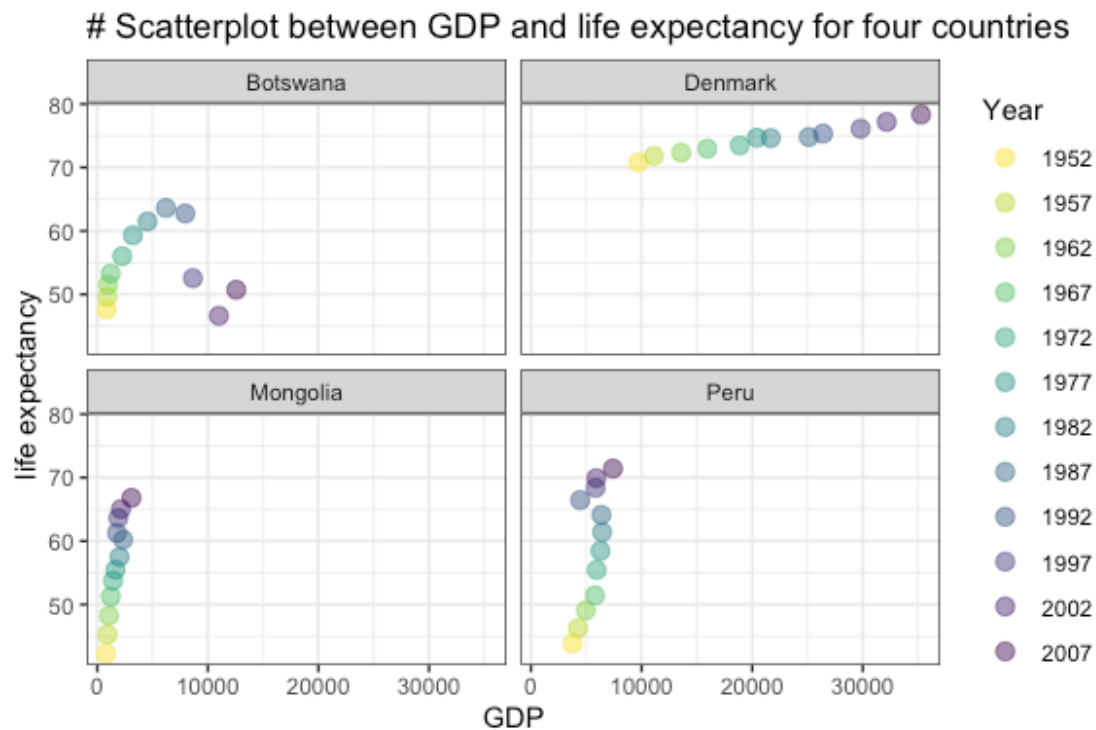
## Question 2

```
gap2<-gap%>%
  filter(country=="Denmark"|country=="Peru"|country=="Botswana"|country=="Mongolia")
gap2$year=as_factor(gap2$year)

a<-ggplot(gap2, aes(x = gdpPercap, y = lifeExp, color=year)) +
  geom_point(size=3, alpha=.5) +
  xlab("GDP") + ylab("life expectancy") +
  ggtitle("# Scatterplot between GDP and life expectancy for four countries")+
  theme(viridis)
```

```
scale_color_viridis(discrete = TRUE,direction = -1,name="Year")+
theme_bw()+
facet_wrap(~country)
```

a

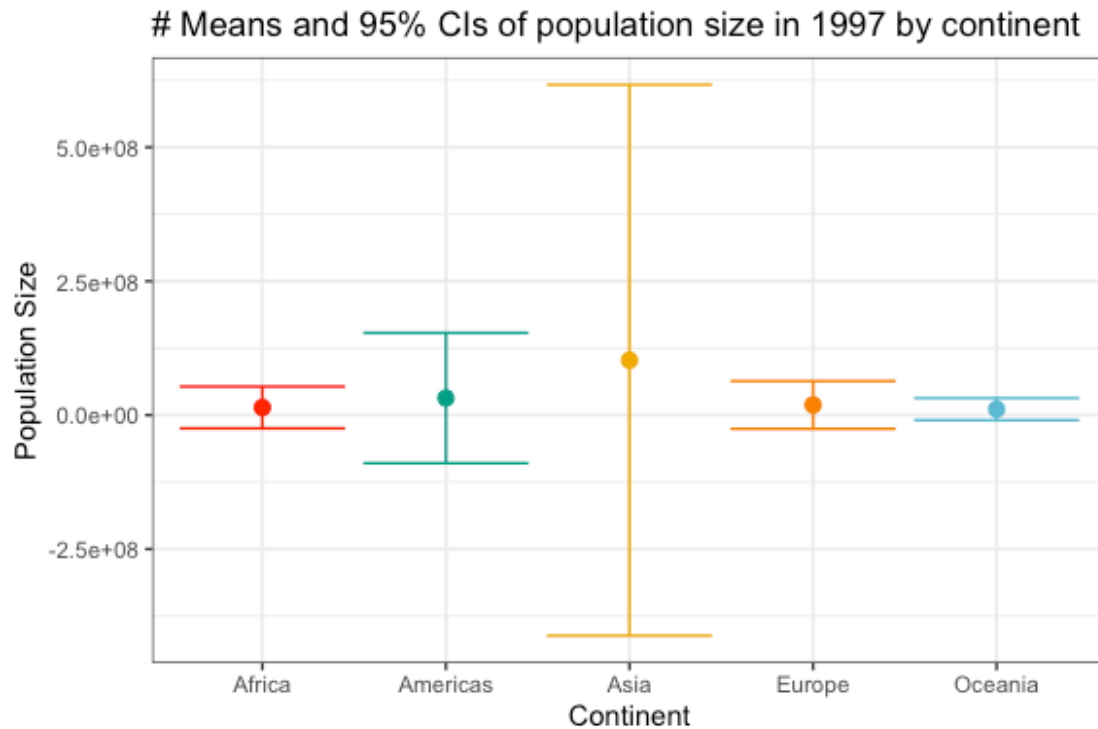


### Question 3

```
gap3<-gap%>%
  filter(year==1997)%>%
  group_by(continent)%>%
  summarise(mean=mean(pop),sd=sd(pop))%>%
  mutate(LB=mean-1.96*sd, UB=mean+1.96*sd)
col = wes_palette("Darjeeling1", 5, type = c("discrete"))

b<-ggplot(gap3,aes(x=continent,y=mean,color=continent))+
  geom_point(size=2.5)+
  geom_errorbar(aes(ymin=LB,ymax=UB))+
  ylab("Population Size")+ xlab("Continent")+
  ggtitle("# Means and 95% CIs of population size in 1997 by continen
t")+
  theme_bw()+
  theme(legend.position = "none")+
  scale_colour_manual(values=col)
```

b



#### Question 4

```
gap4<-gap%>%  
  filter(year==2007)%>%  
  filter(lifeExp<=min(lifeExp) | lifeExp>=max(lifeExp))%>%  
  arrange(lifeExp)%>%  
  select(country,lifeExp)
```

The country **Swaziland** has the lowest life expectancy at birth in the year 2007, with the value of **39.6** years. Whereas, the country **Japan** has the highest life expectancy at birth in the year 2007, with the value of **82.6** years.