Economist

Hanh Nguyen

The dataset (Economist.csv) consists of countries scored on how corrupt their public sectors are seen to be (Corruption Perceptions Index - CPI) and on achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living (Human Development Index - HDI).

```
library(ggplot2)
library(ggrepel)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

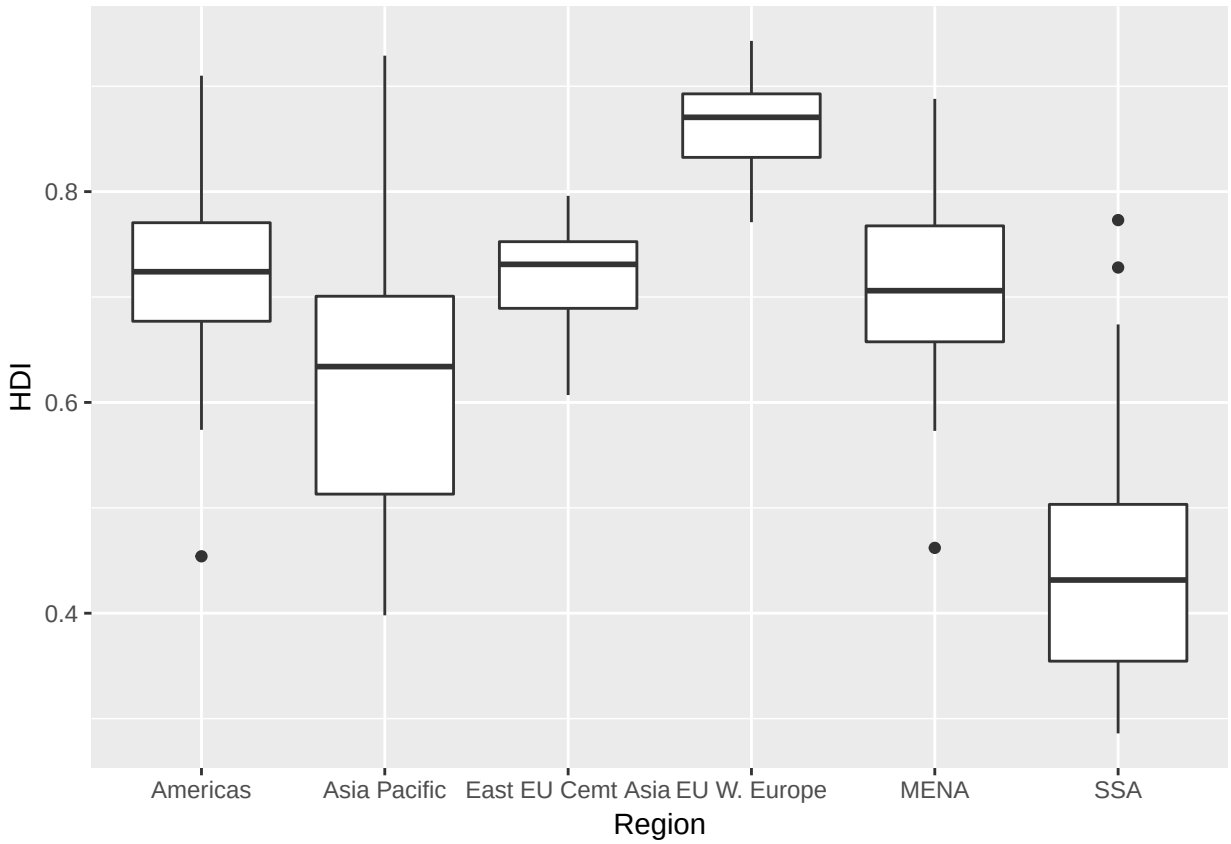
```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(reshape2)
dat = read.csv(file="/Users/user/GitHub/data-vis/dataSets/EconomistData.csv",header=TRUE)
dat$CPI.Rank = rank(dat$CPI,ties.method="first")
```

1. Visualization on national level

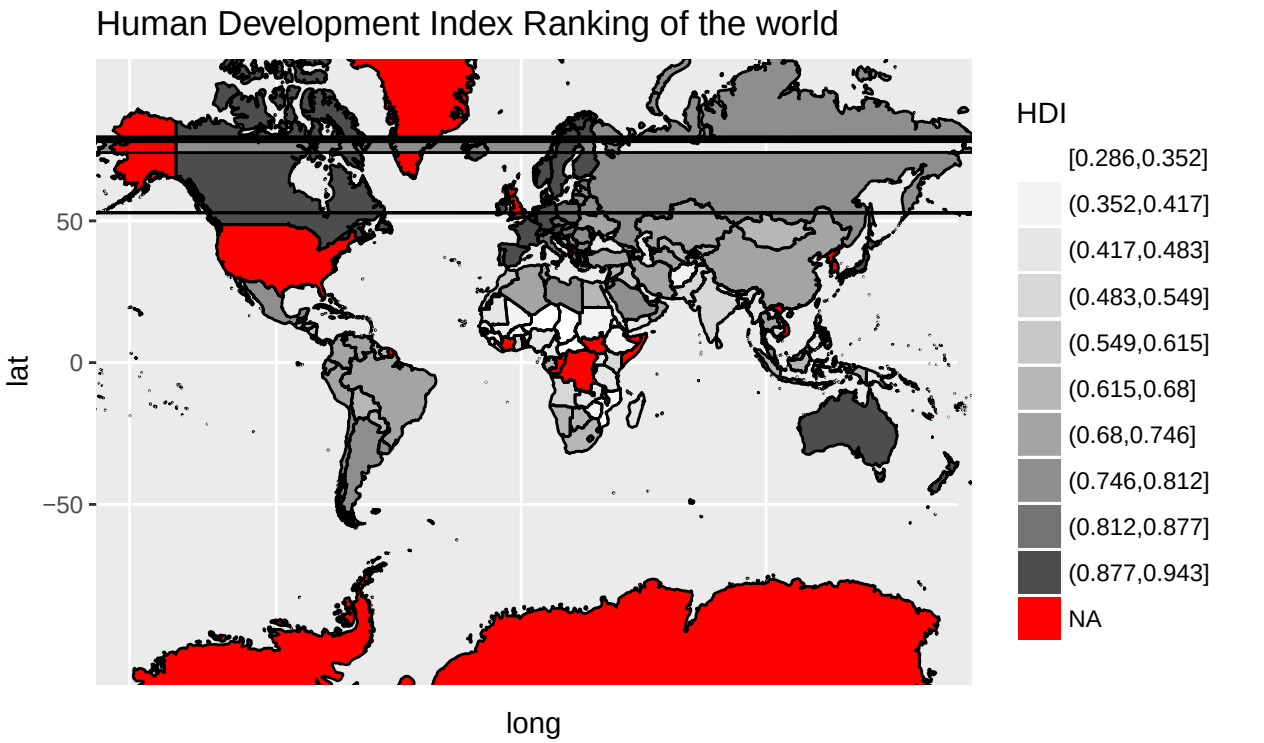
Human Development summary

```
dat %>%
  ggplot(aes(x = Region, y = HDI)) + geom_boxplot()
```



Human Development on the world map

```
dfworldmap = map_data("world")
map_data = merge(dfworldmap, dat,by.x="region",by.y="Country",all=TRUE)
map_data = transform(map_data, HDI = cut_interval(HDI, 10))
map_data = map_data[order(map_data$order),]
map_data %>%
  ggplot(aes(x=long, y=lat, group=group)) +
  geom_polygon(aes(fill = HDI)) +
  scale_fill_grey(start=1, end =.3) +
  geom_path(colour='black') +
  coord_map() +
  ggtitle("Human Development Index Ranking of the world")
```



cut_interval makes n groups with equal range; *cut_number* makes n groups with (approximately) equal numbers of observations; *cut_width* makes groups of width.

Some countries are named differently from dat and dfworldmap so renaming them is necessary.

Countries in dat that do not have any match in dfworldmap: **df1 = map_data[is.na(map_data$long),]**

Countries in dfworldmap that do not have any match in dfworldmap: **df2 = map_data[is.na(map_data$CPI),]** and **sort(unique(df2$region))**

```
dat$Country[dat$Country=="Korea (South)"] = "South Korea"
```

```
## Warning in `[<-.factor`(`*tmp*`, dat$Country == "Korea (South)", value =
## structure(c(1L, : invalid factor level, NA generated
```

```
dat$Country[dat$Country=="United States"] = "USA"
```

```
## Warning in `[<-.factor`(`*tmp*`, dat$Country == "United States", value =
## structure(c(1L, : invalid factor level, NA generated
```

```
dat$Country[dat$Country=="Britain"] = "UK"
```

```
## Warning in `[<-.factor`(`*tmp*`, dat$Country == "Britain", value =
## structure(c(1L, : invalid factor level, NA generated
```

```
dat$Country[dat$Country=="Trinidad and Tobago"] = "Trinidad"
```

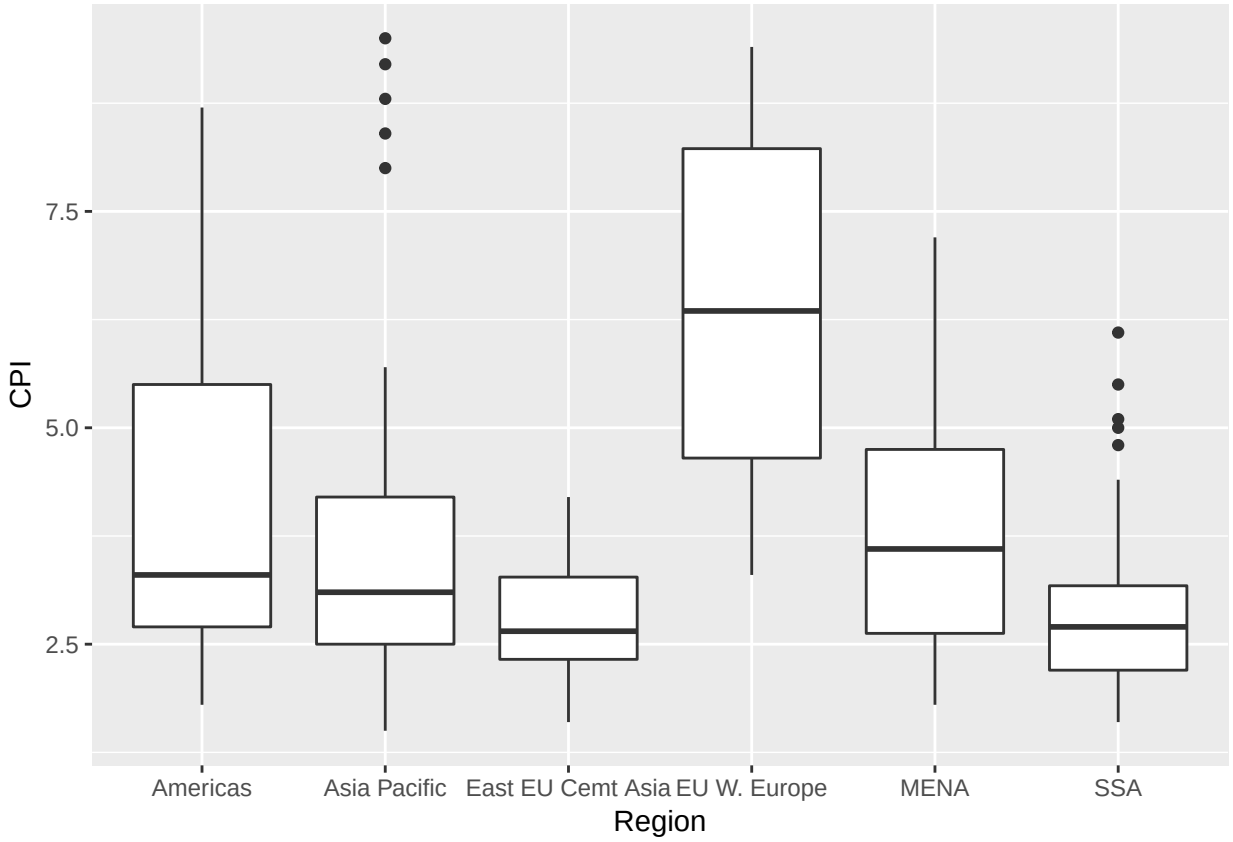
```
## Warning in `[<-.factor`(`*tmp*`, dat$Country == "Trinidad and Tobago",
## value = structure(c(1L, : invalid factor level, NA generated
```

```
dat$Country[dat$Country=="Congo  Republic"] = "Democratic Republic of the Congo"
```

```
## Warning in `[<-.factor`(`*tmp*`, dat$Country == "Congo Republic", value =
## structure(c(1L, : invalid factor level, NA generated
```

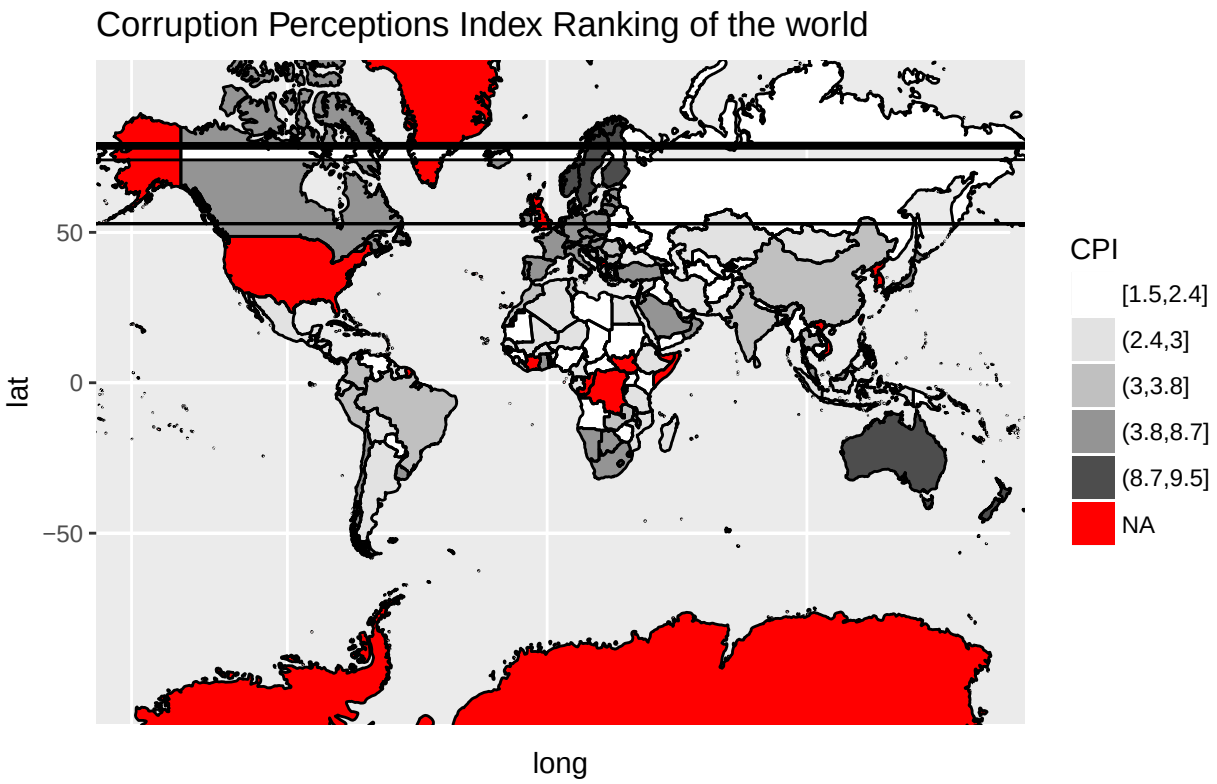
Corruption Perceptions

```
dat %>%
  ggplot(aes(x = Region, y = CPI)) + geom_boxplot()
```



Corruption Perceptions on the world map

```
map_data = merge(dfworldmap, dat,by.x="region",by.y="Country",all.x=TRUE)
map_data = transform(map_data, CPI = cut_number(CPI, 5))
map_data = map_data[order(map_data$order),]
map_data %>%
  ggplot(aes(x=long, y=lat, group=group)) +
  geom_polygon(aes(fill = CPI)) +
  scale_fill_grey(start=1, end =.3) +
  geom_path(colour='black') +
  coord_map() +
  ggtitle("Corruption Perceptions Index Ranking of the world")
```

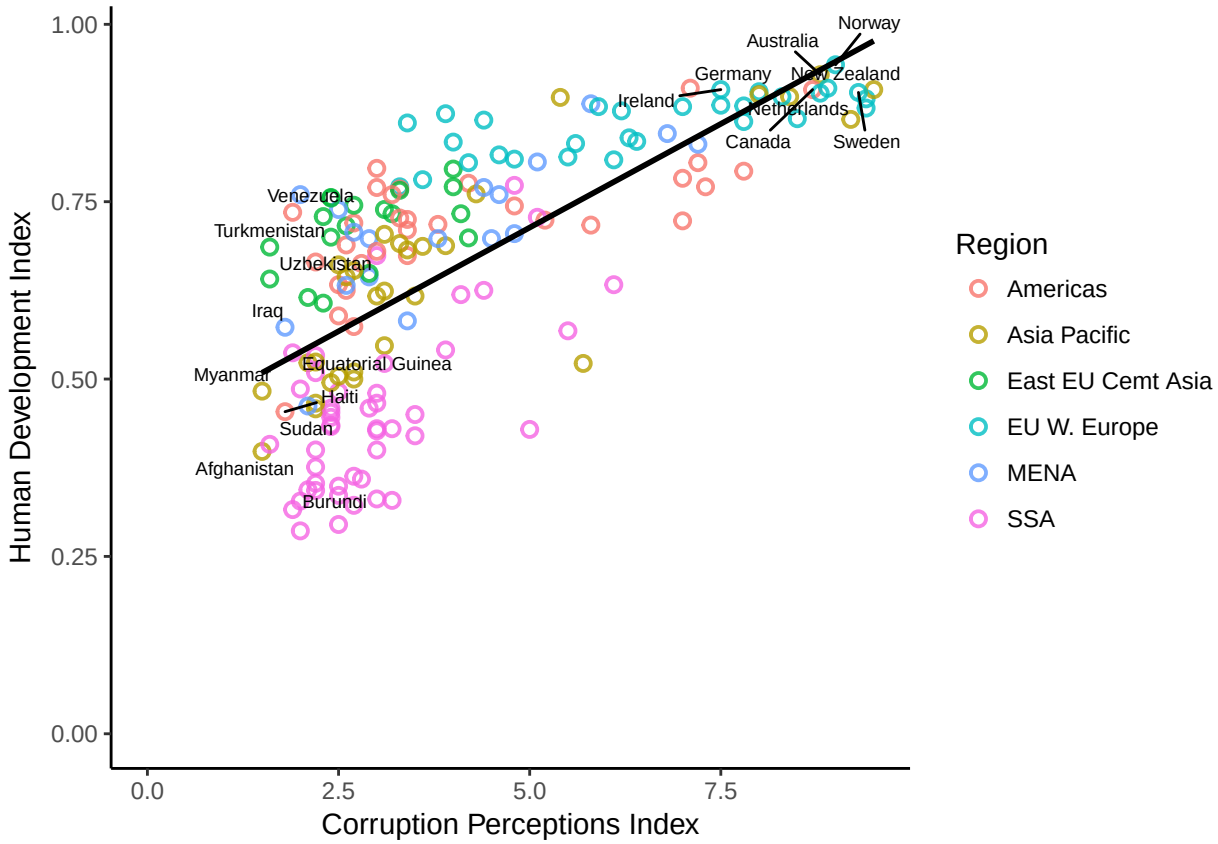


Corruption Perceptions and Human Development

geom_smooth() is used to add a smooth line.

```
dat %>%
  ggplot(aes(x = CPI, y = HDI)) +
  geom_point(aes(col=Region),shape=1,stroke=1,size=2,alpha=.8) +
  geom_smooth(method="lm",se=FALSE,col="black") +
  labs(x="Corruption Perceptions Index",y="Human Development Index") +
  theme_classic() +
  geom_text_repel(data=subset(dat, HDI.Rank <=10 | CPI.Rank <=10),aes(CPI, HDI, label = Country),size=2
  expand_limits(x = 0, y = 0)
```

```
## Warning: Removed 1 rows containing missing values (geom_text_repel).
```



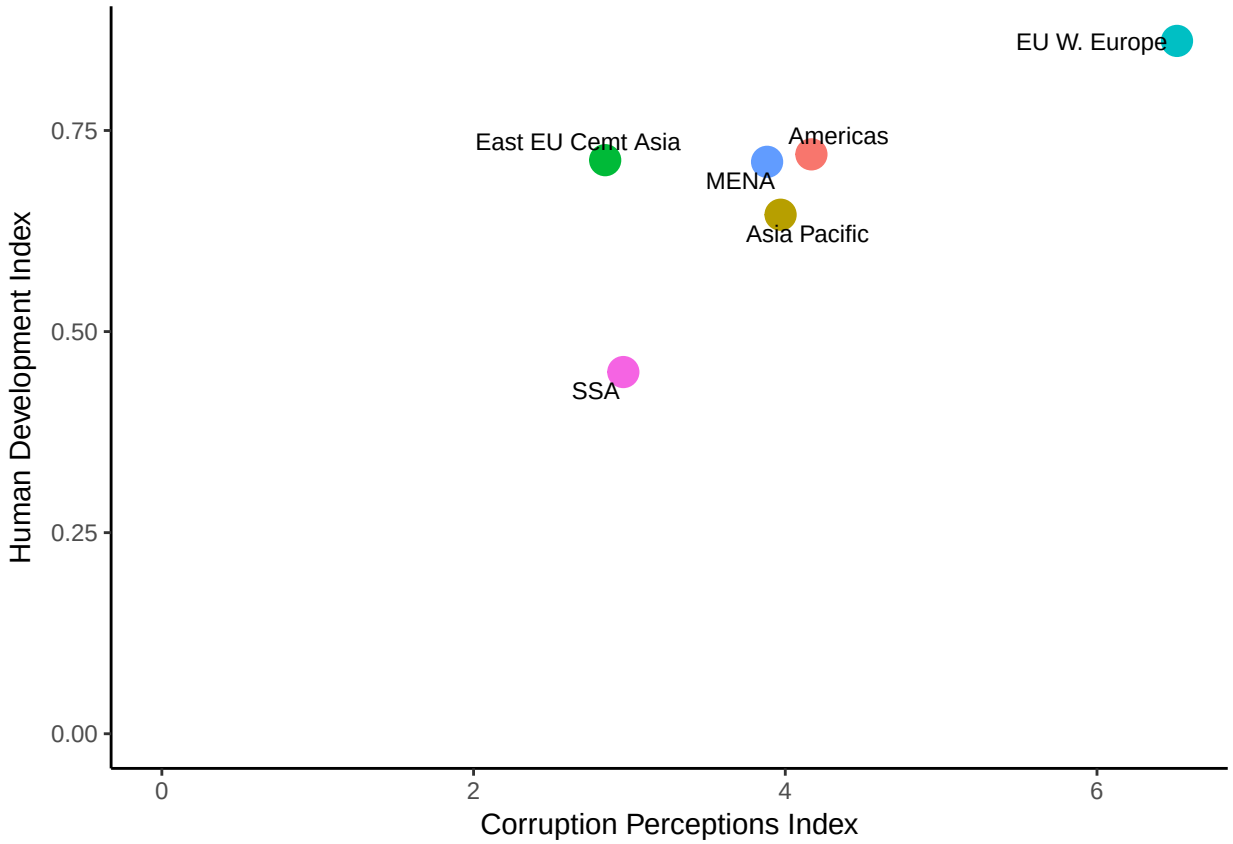
2. Visualization on regional level

We first aggregate (group by) the data by region

```
reg_dat= dat %>%
  group_by(Region) %>%
  summarize(avgCPI=mean(CPI,na.rm=T),avgHDI=mean(HDI,na.rm=T)) %>%
  arrange(avgCPI, avgHDI)
reg_dat$CPI.Rank = rank(reg_dat$avgCPI,ties.method="first")
reg_dat$HDI.Rank = rank(reg_dat$avgHDI,ties.method="first")
```

Corruption Perceptions and Human Development

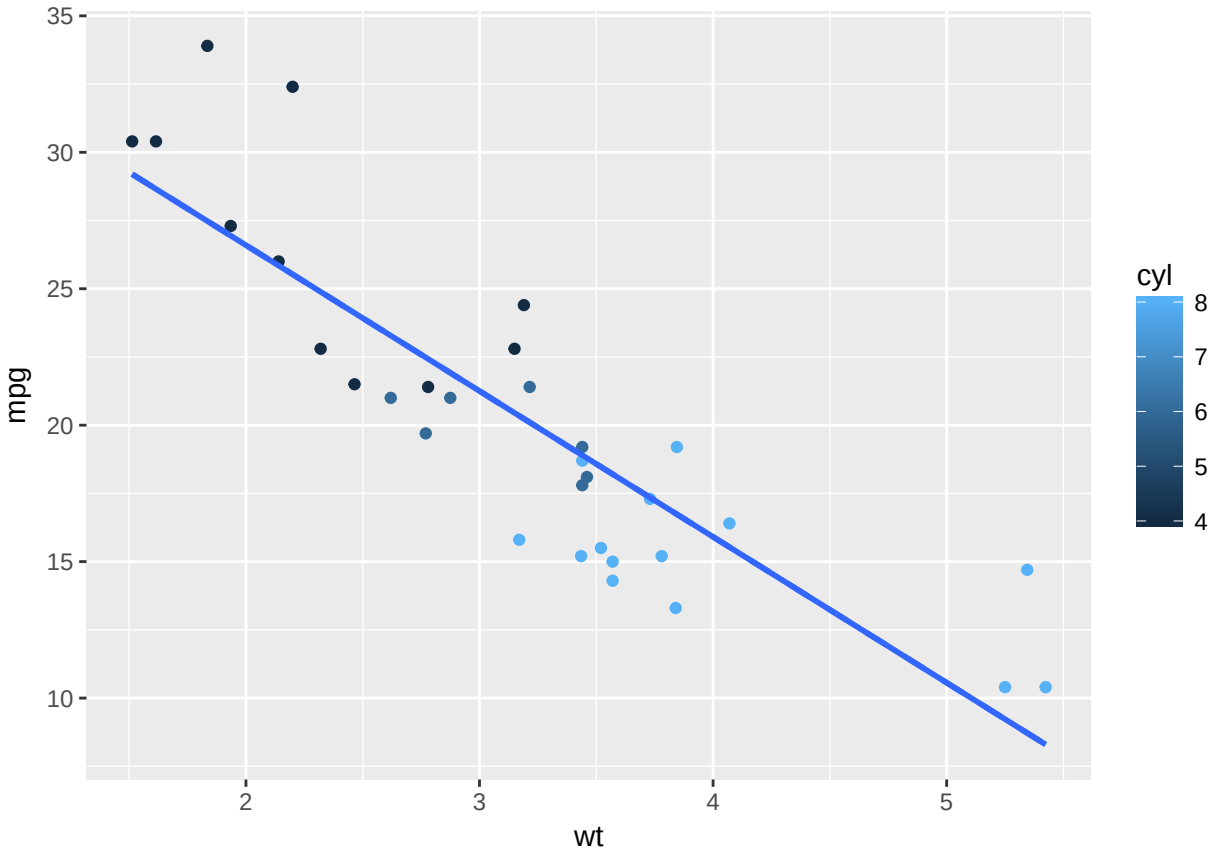
```
reg_dat %>%
  ggplot(aes(x = avgCPI, y = avgHDI)) +
  geom_point(aes(col=Region),size=5) +
  labs(x="Corruption Perceptions Index",y="Human Development Index") +
  theme_classic() +
  geom_text_repel(aes(avgCPI, avgHDI, label = Region),size=3) +
  expand_limits(x = 0, y = 0) +
  guides(col=F)
```



Example: a lm for entire dataset and other lms for subsets

Plot 3: include a lm for the entire dataset in its whole

```
ggplot(mtcars, aes(x = wt, y = mpg, col = cyl)) +
  geom_point() +
  geom_smooth(method = "lm", se = FALSE) +
  geom_smooth(aes(group = 1), method = "lm", se = FALSE, linetype = 2)
```



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