Project 1: Visualizations

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Load libraries

```
if (!require("pacman")) install.packages("pacman")
pacman::p_load(ggplot2, dplyr, reshape, ggrepel)
```

Load and transform data

```
# Load data
world_stats <- read.csv("data.csv")

# Drop columns, rows
world_stats <- select(world_stats, -c(Series.Code, Country.Code))
world_stats <- world_stats[-c((nrow(world_stats)-5):nrow(world_stats)),]

# Rename year columns
cols_containing_x <- names(world_stats[, grepl( "X" , names(world_stats) )])
new_names <- substring(cols_containing_x, 2, 5)
colnames(world_stats)[colnames(world_stats) %in% cols_containing_x] <- new_names

# Reshape data
md <- melt(world_stats, id=(c("Country.Name","Series.Name")))
world_stats <- cast(md, "Country.Name+variable~Series.Name")
world_stats <- world_stats[,-c(5,12:16)]

# Rename metrics
colnames(world_stats)[c(2,3,4,5,6,7,8,9,10,11)] <-
↪  c("year","adolescent_fertility","gdp","life_expectancy","mortality_rate","net_migration","prem","pop_grow

# Convert factors to numeric
as.numeric.factor <- function(x) {as.numeric(levels(x))[x]}
world_stats_numerics <- lapply(world_stats[,c(3:dim(world_stats)[2])], as.numeric.factor)
world_stats_numerics <- as.data.frame(world_stats_numerics)
world_stats <- cbind(world_stats[,c(1,2)],world_stats_numerics)

# Change units of GDP
world_stats$gdp <- world_stats$gdp/(1000000000)
```

Add corruption index to data

```
# Create corruption index lookup table
ci_df <- read.csv("cpi.csv", sep=";")
ci_df <- ci_df[,-c(1,2,4,7)]
ci_df <- ci_df[ci_df$time==2018,c(1,3)]
colnames(ci_df) <- c("Country.Name","cpi")
ci_df$Country.Name <- as.character(ci_df$Country.Name)
```

Synchronize names between tables

```
# Get country names from world_stats df and corruption index df
countries_ws <- levels(droplevels(world_stats$Country.Name))
countries_ci <- ci_df$Country.Name

already_renamed = list()
idx = 0
'%ni%' <- Negate('%in%')

# Loop through world_stats df and synchronize differing country names
for(country in countries_ws) {
  j = agrep(country, countries_ci, ignore.case = FALSE, value = FALSE, max.distance = 0.1)
  if(length(j) == 1) {
    levels(world_stats$Country.Name)[levels(world_stats$Country.Name) == country] <-
    ↪  ci_df$Country.Name[j]
    already_renamed[idx] <- ci_df$Country.Name[j]
  }
  idx = idx + 1
}

# Loop through corruption_index df and synchronize differing country names
for(i in 1:nrow(ci_df)) {
  if(ci_df$Country.Name[i] %ni% already_renamed) {
    j = agrep(ci_df$Country.Name[i], countries_ws, ignore.case = FALSE, value = FALSE, max.distance
↪  = 0.1)
    if(length(j) == 1) {
      ci_df$Country.Name[i] <- countries_ws[j]
    }
  }
}
```

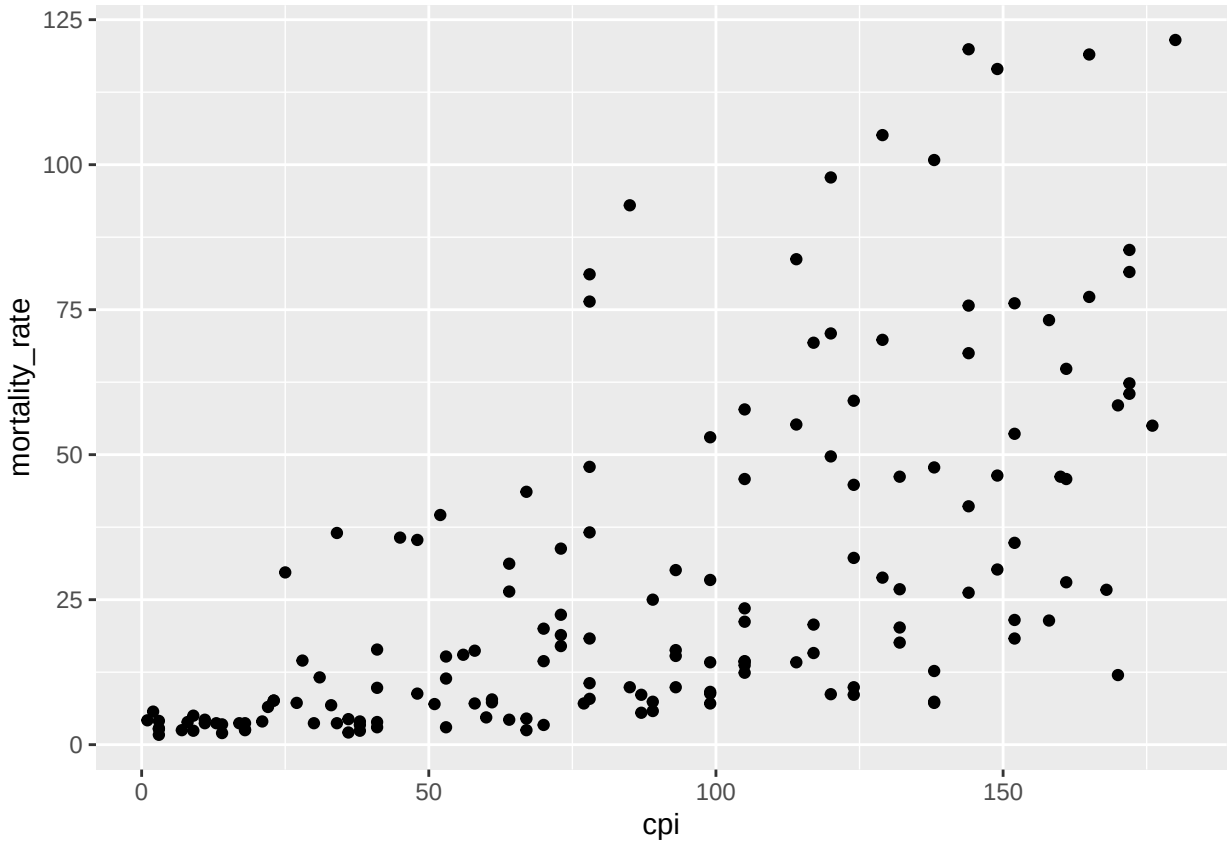
Join tables (economic and corruption data) and create categorical features

```
# Create joined table
world_stats <- full_join(world_stats, ci_df, by = "Country.Name")

# Update world stats table with corruption level
world_stats <- world_stats %>% mutate(ci_rating = case_when(
                                    cpi >= 120  ~ "very corrupt",
                                    cpi < 120 & cpi >= 70 ~ "corrupt",
                                    cpi < 70 & cpi >= 50 ~ "somewhat corrupt",
                                    cpi < 50 & cpi >= 25 ~ "clean",
                                    cpi < 25 ~ "very clean"))

world_stats <- world_stats %>% mutate(mortality_cat = case_when(
                                    mortality_rate <= 15 ~ "low",
                                    mortality_rate > 15 & mortality_rate <= 30 ~ "medium",
                                    mortality_rate > 30 ~ "high"))

# Drop NAs
world_stats <- world_stats[which(!is.na(world_stats$gdp) & !is.na(world_stats$cpi) &
↪  !is.na(world_stats$mortality_cat)),]

# Create df for 2018
```

```r
world_stats_2018 = world_stats[world_stats$year==2018,]
world_stats_2018$ci_rating <- factor(world_stats_2018$ci_rating, levels = c("very clean", "clean",
↪  "somewhat corrupt", "corrupt", "very corrupt"))
```

Draft: visualization 1

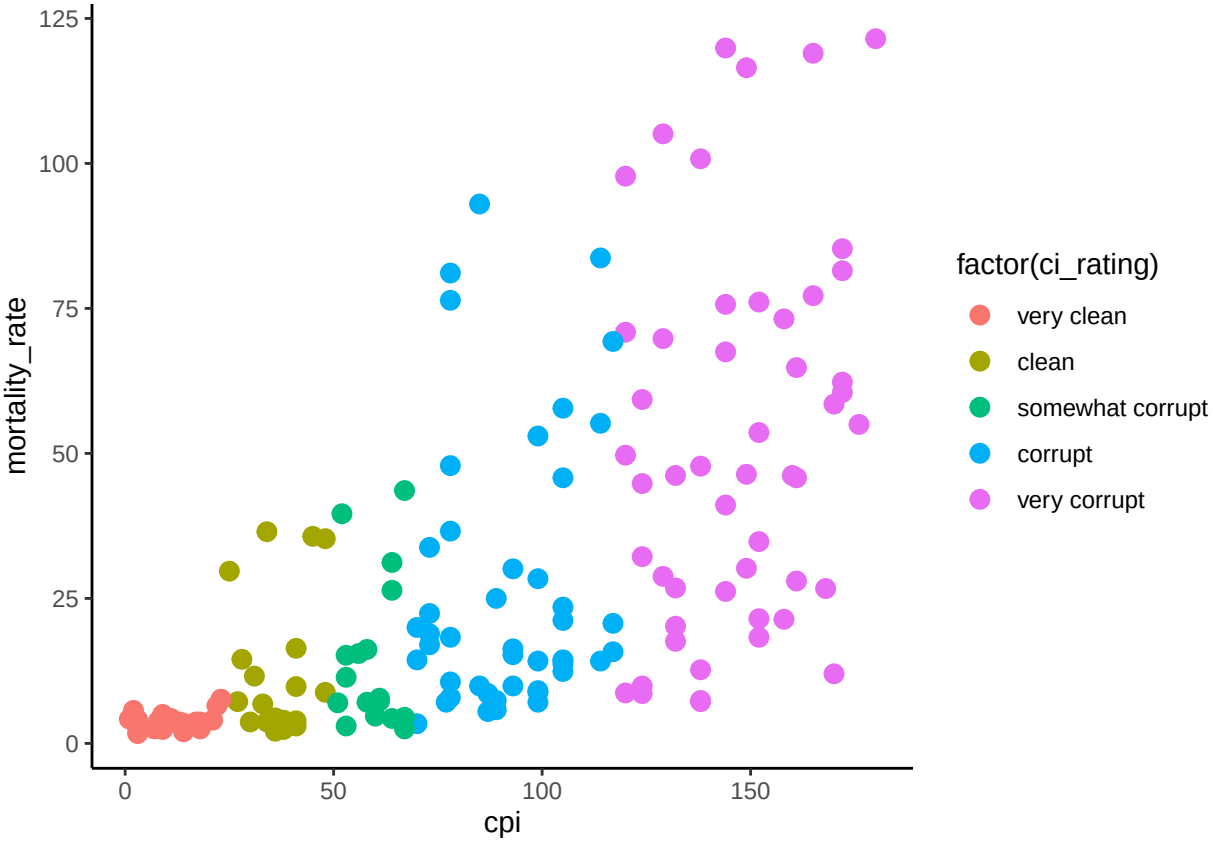
In the first visualization, mortality rate is plotted against corruption to get a sense of correlation between the two variables.



Draft 2: visualization 2

In the second visualiation:

- Color is introduced to segment the corruption rating of different countries
- Point size is increased for readability
- The graph grid is removed and axes cleaned up



Final: visualization 3

The final visualization:

- Adds title and subtitle
- Adds X and Y-axis titles
- Adjusts size of X and Y-axis labels
- Adds size dimension to points, indicating GDP of country
- Adds annotations of countries
- Adds red color scheme indicating level of mortality (darker=higher mortality)
- Lightened XY axes

Global Infant Mortality vs Corruption

Data collected from World Bank and Corruption Perceptions Index