Models_AdrianBrenner_IB_ResearchDesign

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```
# This is the code for importing and cleaning the chosen Datasets.

if (!requireNamespace("readxl", quietly = TRUE)) {
  install.packages("readxl")
}
library(readxl)
```

```
## Warning: Paket 'readxl' wurde unter R Version 4.3.2 erstellt
```

```
xlsx_file <- "C:/Users/AD/Desktop/data/BattleDeaths_v23_1.xlsx"


data <- read_xlsx(xlsx_file)

# In the first cleaning step i removed all conflict, not taking place in region = 4 (Africa)
new_data <- data[data$region == 4, ]

# The second step involves removing all cases where there is only one belligerent on the second side, t

cleaned_data <- new_data[complete.cases(new_data$gwno_b_2nd), ]

cleaned_data_2 <- new_data[complete.cases(new_data$gwno_a_2nd), ]

# The third step is to combine both data sets into one and remove the duplicates.

library(dplyr)
```

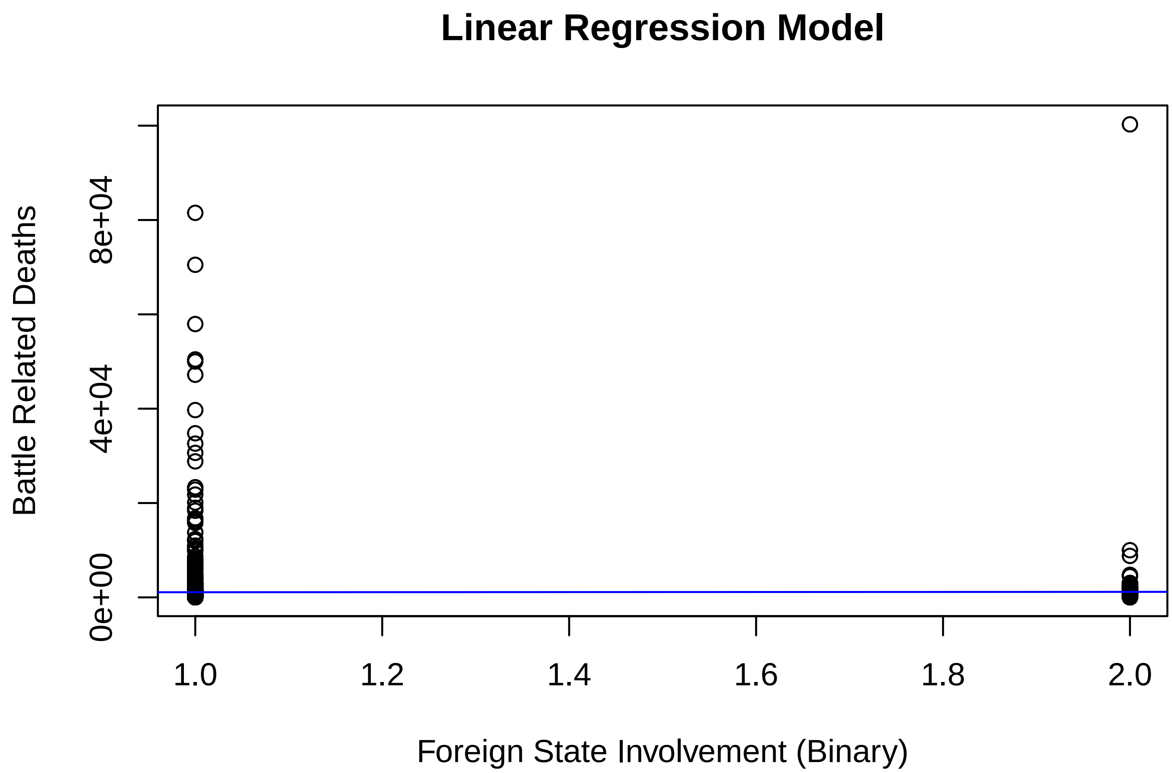
```
##
## Attache Paket: 'dplyr'

## Die folgenden Objekte sind maskiert von 'package:stats':
##
##     filter, lag

## Die folgenden Objekte sind maskiert von 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
# Assuming 'cleaned_data' and 'cleaned_data_2' are your datasets
# Combine the datasets and remove duplicates
combined_data <- bind_rows(cleaned_data, cleaned_data_2) %>%
  distinct()

#The final Dataset cleaned for the linear regression model of 4.2.1 now contains 238 distinct cases. I
```

```r
#TO create the opposite Dataset (the one with no intervention) I just subtract the combined_data from t
rest_data <- anti_join(data, combined_data)
```

```
## Joining with `by = join_by(conflict_id, dyad_id, location_inc, side_a,
## side_a_id, side_a_2nd, side_b, side_b_id, side_b_2nd, incompatibility,
## territory_name, year, bd_best, bd_low, bd_high, type_of_conflict,
## battle_location, gwno_a, gwno_a_2nd, gwno_b, gwno_b_2nd, gwno_loc, gwno_battle,
## region, version)`
```

```r
# In this next step I will create the regression model to include the battle related Deaths count of th

# Assuming 'rest_data' and 'combined_data' are your datasets
# Assuming 'Battle_Related_Deaths' is the dependent variable

# Create a binary predictor variable
predictor_variable <- rep(c(0, 1), c(nrow(rest_data), nrow(combined_data)))

# Combine the datasets
all_data <- bind_rows(rest_data, combined_data)

# Create a linear regression model
model <- lm(bd_best ~ as.factor(predictor_variable), data = all_data)

# Plot the linear regression model
plot(all_data$bd_best ~ as.factor(predictor_variable),
     xlab = "Foreign State Involvement (Binary)",
     ylab = "Battle Related Deaths",
     main = "Linear Regression Model")

# Add the regression line to the plot
abline(model, col = "blue")
```




```r
# I now extrace its coefficients, slope and intercept.

# Get coefficients of the linear regression model
coefficients <- coef(model)

# Extract slope and intercept
slope <- coefficients[2]   # Coefficient for the predictor variable
intercept <- coefficients[1]   # Intercept term

# Print the results
cat("Slope:", slope, "\n")
```

```
## Slope: 73.76704
```

```r
cat("Intercept:", intercept, "\n")
```

```
## Intercept: 1013.859
```

```r
summary(model)
```

```
##
## Call:
## lm(formula = bd_best ~ as.factor(predictor_variable), data = all_data)
##
## Residuals:
##    Min     1Q Median     3Q    Max
##  -1062   -975   -898   -545  99194
##
```

```
## Coefficients:
##                              Estimate Std. Error t value Pr(>|t|)
## (Intercept)                   1013.86     121.60   8.337   <2e-16 ***
## as.factor(predictor_variable)1    73.77     338.85   0.218    0.828
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 4879 on 1846 degrees of freedom
## Multiple R-squared:  2.567e-05,  Adjusted R-squared:  -0.000516
## F-statistic: 0.04739 on 1 and 1846 DF,  p-value: 0.8277
```

```r
# T-test for the coefficient of the predictor variable
t_test <- summary(model)$coefficients["as.factor(predictor_variable)1", "t value"]

# Print the t-test result
cat("T-test for the coefficient of the predictor variable:", t_test, "\n")
```

```
## T-test for the coefficient of the predictor variable: 0.2176953
```

```r
# Extracting the residual standard error
residual_standard_error <- summary(model)$sigma

# Degrees of freedom
df <- length(model$coefficients) - 1  # Subtract 1 for the intercept term

# Chi-square test statistic
chi_square <- (t_test^2) / residual_standard_error^2

# P-value for chi-square test
p_value_chi_square <- 1 - pchisq(chi_square, df)

# Print the chi-square test results
cat("Chi-square test statistic:", chi_square, "\n")
```

```
## Chi-square test statistic: 1.990538e-09
```

```r
cat("Degrees of freedom:", df, "\n")
```

```
## Degrees of freedom: 1
```

```r
cat("P-value for chi-square test:", p_value_chi_square, "\n")
```

```
## P-value for chi-square test: 0.9999644
```

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