SOC 4015/5050: Lecture 14 Functions

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Packages

- `base`
- `car`
- `heplots`
- `graphics`
- `lmtest`
- `sandwich`
- `stargazer`
- `stats`
- `tidyverse`
  - `dplyr`
  - `tibble`

Utility Functions

Printing Row Numbers

```
base::which(x)
```

Matching Values

```
base::%in%
```

Creating ID Numbers

```
tibble::row_to_column(varName)
```

Listing All Variable Names

```
dplyr::everything()
```

Accessing Row Numbers

```
dplyr::row_number()
```

Printing Problematic Observations

```
printObs <- function(.data, values){

  .data %>%
    filter(row_number() %in% values) %>%
    select(id, varlist)

}
```

Base R Graphics

Basic Plot

```
graphics::plot(object)
```

Horizontal Line on Plot

```
graphics::abline(h = val, col = "color", lty = val)
```

[1] The `lty` argument accepts values for different line patterns.

Non-Linearity

Matrix of Component Residual Plots

```
car::crPlots(model)
```

Single Component Residual Plot

```
car::crPlot(model, variable = "varName")
```

Unusual Observations

Bonferonni Outlier Test

```
car::outlierTest(model)
```

Leverage Points

```
stats::hatvalues(model)
```

Cook's Distance

```
stats::cooks.distance(model)
```

Normality of Residuals - Q-Q Plots

```
car::qqPlot(model)
```

Homoskedastic Errors

Breusch-Pagan Test

```
lmtest::bptest(model)
```

White's Test

```
lmtest::bptest(model, ~x1 * x2 + I(x1^2) + I(x2^2),
  data = dataFrame)
```

Residual Plot

```
graphics::plot(model, which = 1)
```

Auto-Correlation - Durbin-Watson Test

```
car::durbinWatsonTest(model)
```

Multi-Collinearity - Variance Inflation Factor

```
car::vif(model)
```

"Robust" Standard Errors

Covariance Matrix Estimate

```
sandwich::vcovHC(model, "HC3")
```

New Standard Errors and p-values

```
lmtest::coeftest(model, vcov = cme)
```

Eta-Squared Effect Sizes

```
heplots::etasq(model, partial = FALSE)
```