



**POLITICAL  
SCIENCE  
STATISTICS  
BOOT CAMP**

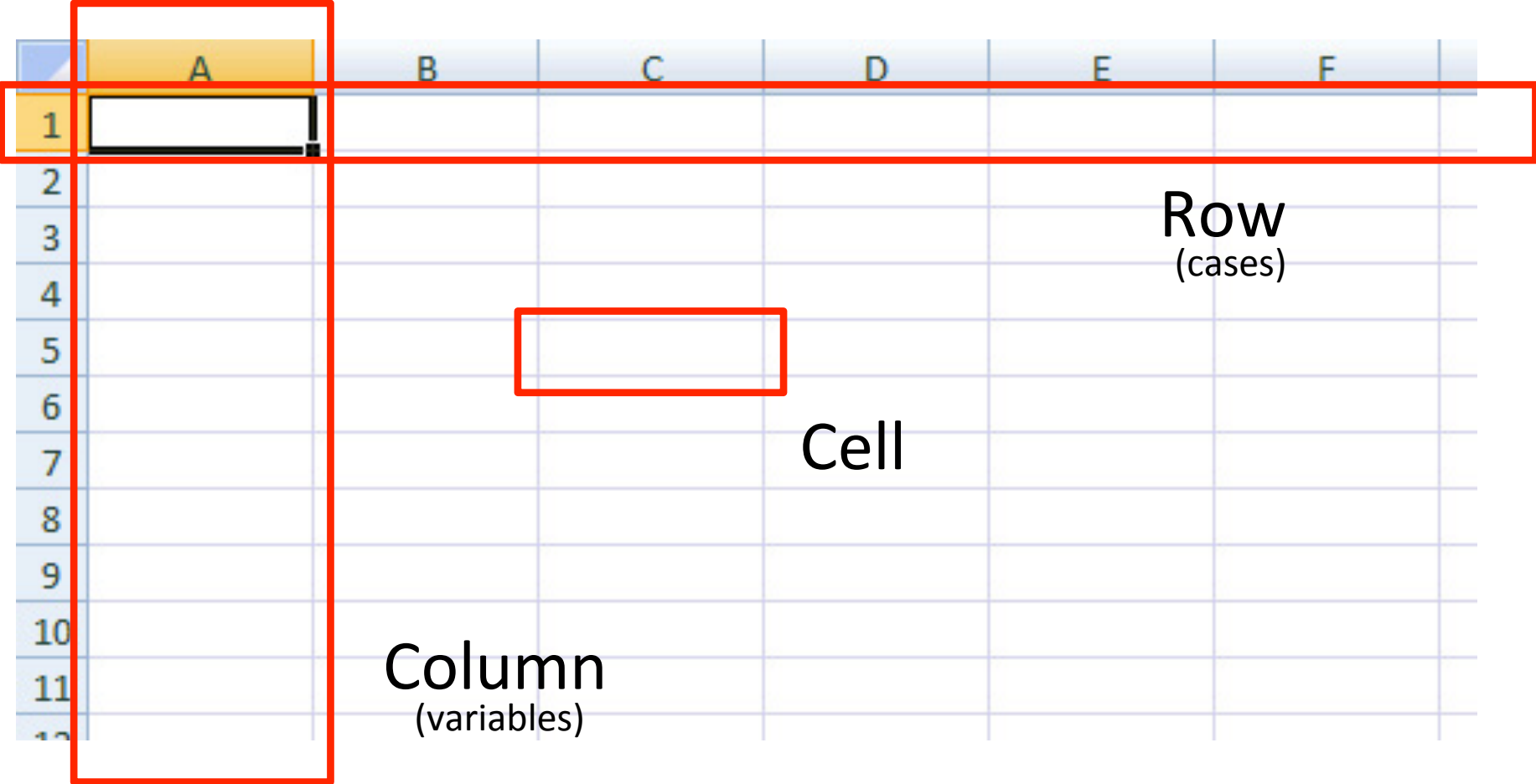
# SPSS



**SPSS** is a statistical software program that allows users to analyze quantitative data.



# A Spreadsheet



# Hypotheses

## **Directional hypotheses**

Reflects a difference between groups, but a direction is specified.

## **Nondirectional hypotheses**

Reflects a difference between groups, but no direction is specified.

## **Null hypotheses**

A statement that there is no relationship between concepts.

# Independent & Dependent Variables

**X**

Independent Variable

Income

Citizen engagement

Race of legislator

**Y**

Dependent Variable

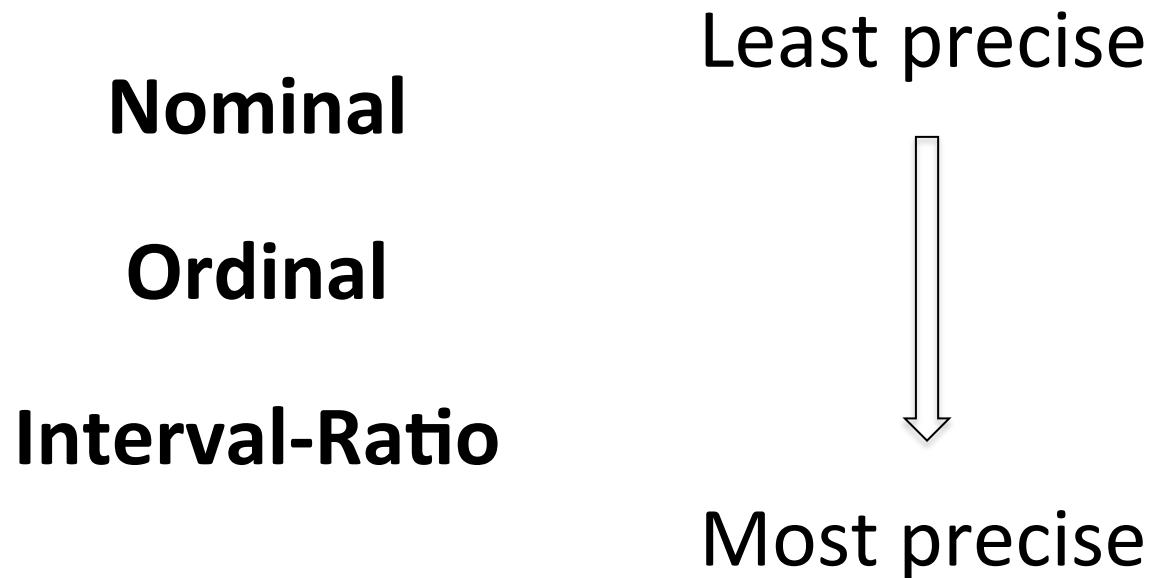
Party identification

Bureaucratic efficiency

Content of legislation

# Levels of Measurement

**Levels of Measurement:** The particular levels at which we measure our outcomes; a classification system



# Example Data

| gender | major | classtanding | midterm |
|--------|-------|--------------|---------|
| 1      | 1     | 1            | 78      |
| 0      | 7     | 4            | 94      |
| 0      | 6     | 4            | 92      |
| 1      | 1     | 3            | 52      |
| 0      | 5     | 4            | 76      |
| 1      | 3     | 2            | 81      |
| 1      | 5     | 1            | 91      |

# Nominal Variables

Defined by the characteristics of an outcome that fit into one and only one class of category.

The variable is measured in categories; non-rankable, non-ordered intervals

Examples: gender, race, marital status, major

| gender |
|--------|
| 1      |
| 0      |
| 0      |
| 1      |
| 0      |
| 1      |
| 1      |



# Ordinal Variables

Defined by the characteristics of an outcome that are able to be ordered.

The variable is measured in categories; rankable and ordered intervals

Examples: party ideology, income (in categories), class standing

| classtanding |
|--------------|
| 1            |
| 4            |
| 4            |
| 3            |
| 4            |
| 2            |
| 1            |

# Interval-Ratio Variables

Interval and ratio variables are identical. The only difference is that ratio variables can identify an absolute zero value.

Together, interval and ratio variables are also known as **continuous variables, scale variables, OR interval-ratio variables.**

Examples: GDP, percentages, test score

# Descriptive Statistics

After the methodology portion of your paper, you should spend time describing your questions by using descriptive statistics.

| <b>Level of Measurement</b> | <b>Central Tendency</b>         | <b>Variance</b>            |
|-----------------------------|---------------------------------|----------------------------|
| Nominal                     | Mode                            | Standard deviation & range |
| Ordinal                     | Mode                            | Standard deviation & range |
| Interval-Ratio              | Mean if no outliers in variable | Standard deviation & range |
|                             | Median if outliers in variable  |                            |

# Graphs

You can also draw graphs of the variables you're using.

| <b>Level of Measurement</b> | <b>Type of Graph</b> |
|-----------------------------|----------------------|
| Nominal                     | Bar Graph            |
| Ordinal                     | Bar Graph            |
| Interval-Ratio              | Histogram            |

# Test Statistics

After describing your variables, you have to figure out what test to perform.

| <b>Independent</b>     | <b>Dependent</b>                   | <b>Test</b>  |
|------------------------|------------------------------------|--|
| Nominal<br>(bivariate) | Nominal/Ordinal/<br>Interval-Ratio | T-test   |
| Nominal/ordinal        | Nominal/ordinal                    | Chi-square   |
| Nominal/ordinal        | Interval-Ratio                     | ANOVA  |
| Interval-Ratio         | Nominal/ordinal                    | Recode your<br>independent<br>variable; Chi-<br>square |
| Interval-Ratio         | Interval-Ratio                     | Correlation &<br>Regression                            |