UWES R Tutorial

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Overview

- Introduction to R
- loading and viewing data
- Data manipulation

Download R and RStudio

R is the programming language and RStudio is an integrated development environment (IDE) for R. You need to install both before you are ready to start programming.

- **Download R:** https://cran.r-project.org/
- **Download RStudio:** https://posit.co/download/rstudio-desktop/

Getting started with R

R and RStudio are free and open source software environment for statistical computing and graphics. It compiles and runs on a wide variety of platforms, including Windows and MacOS.

RStudio IDE

RStudio is an integrated development environment (IDE) for R. It includes a console, syntax-highlighting editor that supports direct code execution, as well as tools for plotting, history, debugging and workspace management.

Why use R?

- R's role in data science and economic research.
- Comparison with other tools like Excel, Python, and Stata.
- Real-world examples of economists and analysts using R.

R Basics - Syntax & Data Types

- Variables and assignment

```
x <- 10
```

- Data types: Numeric, Character, Logical, Factor

```
class(x)
```

```
## [1] "numeric"
```

- Printing values

```
print(x)
```

```
## [1] 10
```

- Comments in R

```
# This is a comment
```

R Basics - Syntax & Data Types

- Arithmetic operations

```
y <- 20
z <- x + y
print(z)
```

```
## [1] 30
```

Data Structures in R

- Vectors (c(1, 2, 3))

```r
v <- c(1, 2, 3)
```

- Matrices (matrix(1:9, nrow = 3))

```r
m <- matrix(1:9, nrow = 3)
```

- Data frames (data.frame(name=c("A", "B"), age=c(21, 25)))

```r
df <- data.frame(name=c("A", "B"), age=c(21, 25))
```

- Lists (list(name="John", age=30, salary=4000))

```r
l <- list(name="John", age=30, salary=4000)
```

Importing & Manipulating Data

Loading built-in datasets (data(mtcars)) Reading CSV files (read.csv("data.csv")) Subsetting data (df[1:10,]) Filtering with logical conditions (subset(df, age $>$ 25))

Basic Data Analysis in R

Content: Summary statistics (summary(mtcars)) Calculating mean, median, standard deviation (mean(mtcarsmpg))$Simpleplotting(hist(mtcars$mpg))

Hands-on Exercise

Activity: Provide a small dataset for participants to load into R. Have them calculate basic statistics (mean, median, standard deviation). Challenge: Plot a histogram or scatterplot.