**Lecture Notes on Conditional Statements in R Programming**

**Introduction**

Conditional statements in R are used to execute different blocks of code based on certain conditions. These statements allow for decision-making in R scripts and functions.

**Types of Conditional Statements**

R provides the following conditional statements:

1. if statement
2. if...else statement
3. if...else if...else statement
4. switch statement

**1. if Statement**

The if statement executes a block of code only if a specified condition is TRUE.

**Syntax:**

if (condition) {

# Code to execute if condition is TRUE

}

**Example:**

x <- 10

if (x > 5) {

print("x is greater than 5")

}

**2. if...else Statement**

The if...else statement provides an alternative block of code to execute when the condition is FALSE.

**Syntax:**

if (condition) {

# Code to execute if condition is TRUE

} else {

# Code to execute if condition is FALSE

}

**Example:**

x <- 3

if (x > 5) {

print("x is greater than 5")

} else {

print("x is not greater than 5")

}

**3. if...else if...else Statement**

This statement is used when multiple conditions need to be checked sequentially.

**Syntax:**

if (condition1) {

# Code to execute if condition1 is TRUE

} else if (condition2) {

# Code to execute if condition2 is TRUE

} else {

# Code to execute if all conditions are FALSE

}

**Example:**

x <- 10

if (x < 0) {

print("x is negative")

} else if (x == 0) {

print("x is zero")

} else {

print("x is positive")

}

**Logical Operators in Conditional Statements**

Logical operators are often used in conditions to combine multiple conditions:

* && (AND)
* || (OR)
* ! (NOT)

**Example:**

x <- 10

y <- 20

if (x > 5 && y > 15) {

print("Both conditions are TRUE")

}

**Practice Problems**

1. Write an R script that checks if a number is even or odd.
2. Create an if...else if...else statement to categorize numbers as negative, zero, or positive.
3. Write an R script that takes an input temperature in Celsius and prints whether it is "Cold" (below 10), "Moderate" (10-25), or "Hot" (above 25).
4. Create an R script that asks for a user's age and determines if they are a minor (under 18), an adult (18-60), or a senior (above 60).
5. Implement a program using if...else to check whether a given year is a leap year.
6. Develop a script where the user enters a grade (A, B, C, D, F), and the script prints the corresponding remark (Excellent, Good, Average, Poor, Fail).