

Lecture 3

Conditional Statements

Objectives

After completing the lesson, the student will be able to:

- Explain the syntax of the simple if statement
- Write programs using one level decision statements and run the program.
- Explain the syntax of two way decision statements.
- Write programs using two way decision statements and run the program.
- Describe the output of programs with relational operators.

Control Structures

- Sequential flow – programming statements are executed in the order of the statements.
- Control structures – allows changing the order of the execution of the program statements.
- Two types of Control Structures
 - Decision control structures - allows us to select specific sections of code to be executed
 - Repetition control structures - allows us to execute specific sections of the code a number of times

Decisions

- A Decision is when a program has more than one choice of actions depending on a variable's value.
- Think of a traffic light.
 - When it is green, we continue our drive. When it is yellow / orange, we reduce our speed, and when it is red, we stop.
 - These are logical decisions that depend on the value of the traffic light.

Decision Control Structures

- Three types
 - if-statement
 - if-else-statement
 - If-else if-statement
- Decision statements allow to select and execute specific blocks of code while skipping other sections.

Simple Decision Statement

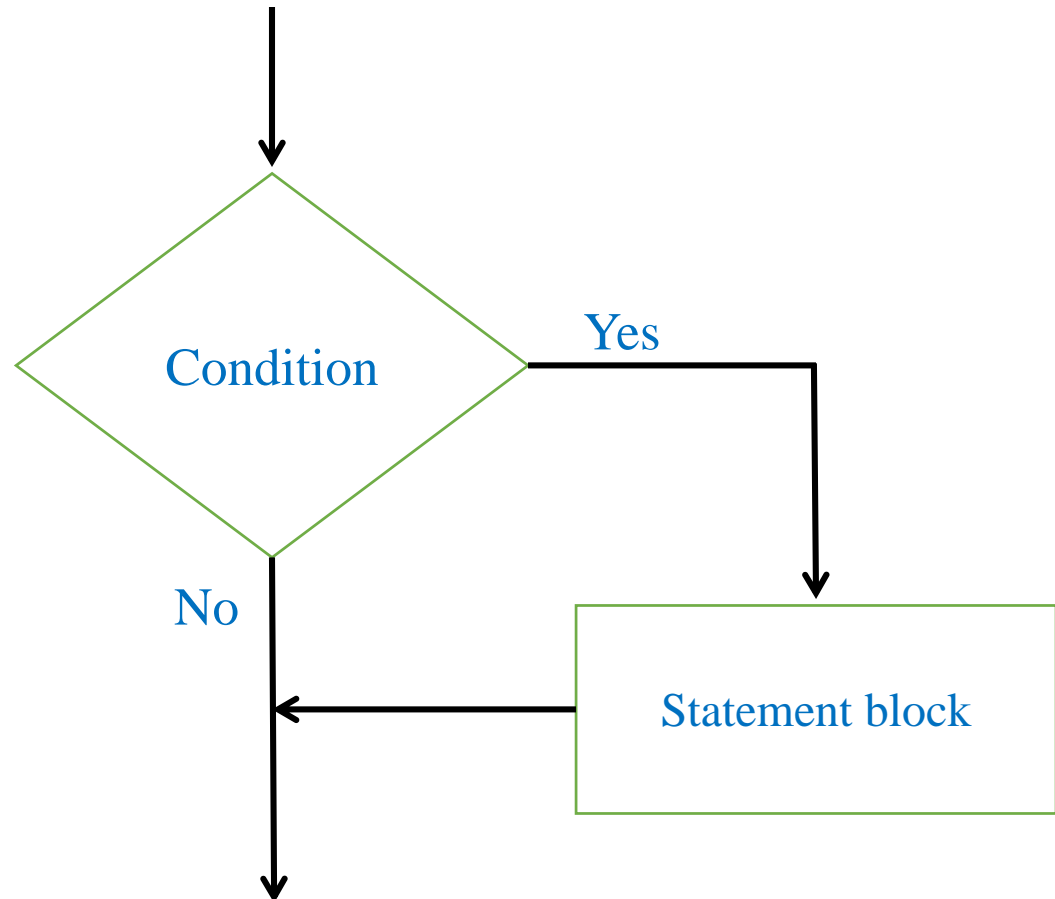
- if-statement
 - Specifies that a statement or a block of code will be executed if and only if a certain condition is true.
- The form of the if statement is:
if condition:
statement or statements
- Example:
if a > 0:
print("It is a positive value")

Simple Decision Statement

- Example:
- `a = 6`
- `b = 4`
- `if a < b:`
- `print("a is greater")`
- `print("rest of the program")`

Simple Decision Statement - Flowchart

- Control flow of if statement



Simple Decision Statement

- First, the condition in the heading is evaluated.
- If the condition is true, the sequence of statements in the body is executed, and then control passes to the next statement in the program.
- If the condition is false, the statements in the body are skipped.

Forming Simple Condition

- Compare the values of two expressions
 - `expression relational operator expression`
- Expression can be a constant, an arithmetic expression or a string.
- Conditions are called a Boolean expression.
- Conditions return int values. A true condition produces a 1, while a false condition produces a 0.

Forming Simple Condition – Example

a=5

b=6

4 > 5

a > b

a+5 > b-2

a/2 = b*3

a != b

Conditional Program Execution

- There are several different ways of running Python programs.
- Programming statements and simple conditions can be run directly on python shell editor.
- Programs with other control structures can be run after creating a file.

Simple Decision Statement - Example

- Checks whether the value of the grade variable is greater than 68.

```
grade = 68
if grade >60:
    print("The grade value is greater than 60.")
```

- Enter the above statements and press enter key twice to see the output.

Simple Decision Statement - Example

- Checks whether the value of the grade variable is greater than 68.

```
grade = 68
if grade >60:
    print("The grade value is greater than 60")
    print("you passed")
```

- Create a Python file and then run the program to see the output.

Simple Decision Statement - Example

- Checks whether the value of the ASCII variable is greater than the ASCII value of B.

```
ASCII = 'A'  
if ASCII > 'B':  
    print("The ASCII value is greater than B")  
print("This ASCII value is less than B")
```

- Create a python file and then run the program to see the output.

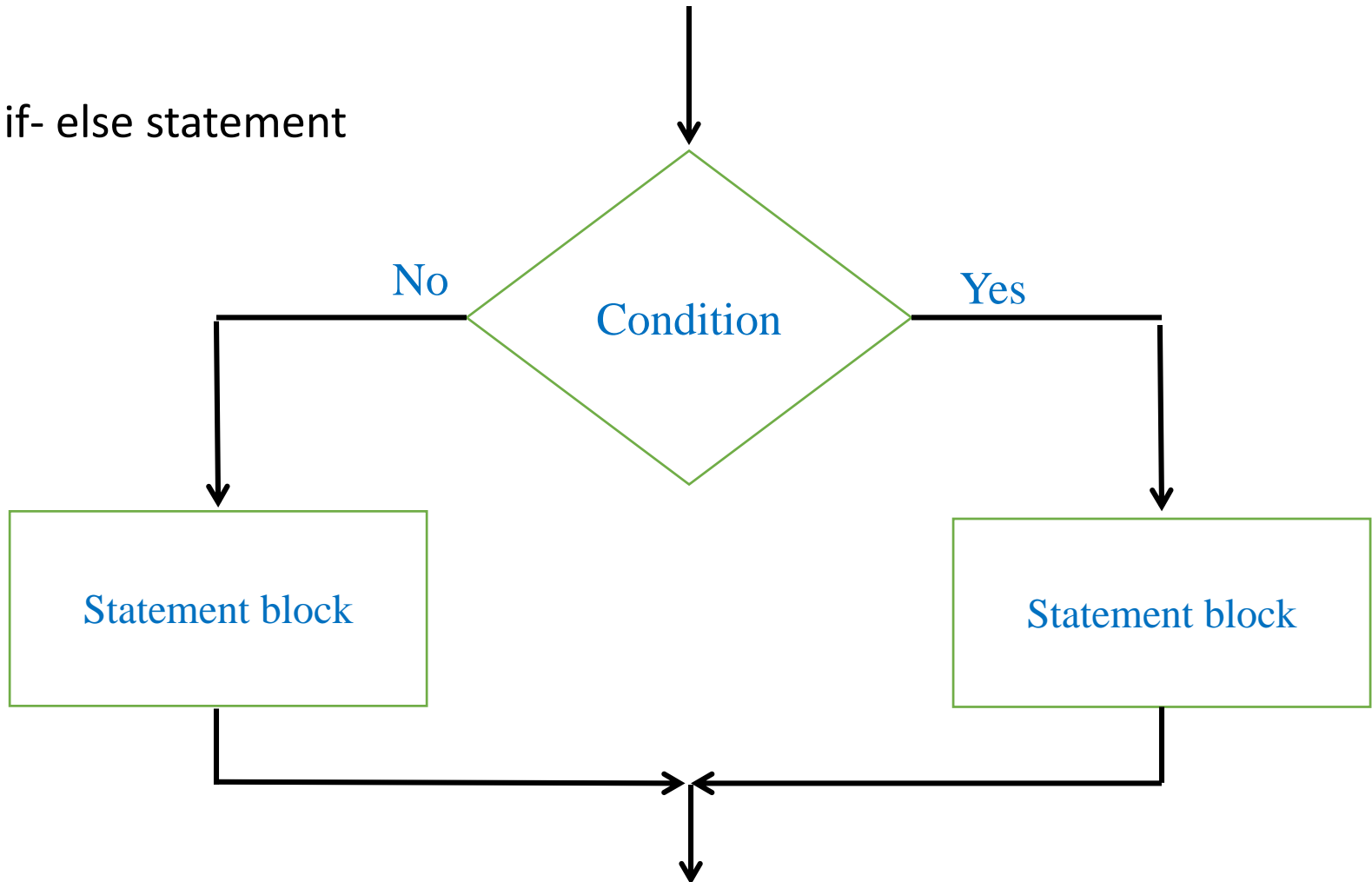
Two-Way Decisions

- Used to execute a certain statement(s) if a condition is true, and a different statement(s) if the condition is false.
- The form of if-else statement is

```
if condition:
    statements
else:
    statements
```


Two-Way Decisions - Flowchart

- if- else statement



Two-Way Decisions

- First it evaluates the condition. If the condition is true, the statements under the if are executed.
- If the condition is false, the statements under the else are executed.
- In either case, control then passes to the statement following the if-else.

Two-Way Decisions

- Example 1: find greater number from two numbers.

```
a = 6
b = 4
if a>b:
    print("a is greater")
else:
    print("b is greater")
print("rest of the program")
```

Two-Way Decisions

- Example 2: This script will compare two strings based on the input from the user:

```
password = input("Enter the password: ")
if password == "hello":
    print("Password Accepted")
else:
    print("Sorry, that is the wrong password.")
```