



Pak-Austria Fachhochschule
Institute of Applied Sciences & Technology

SCHOOL OF COMPUTING SCIENCES

PROGRAMING FOR AI

LAB REPORT # 1

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Variables in Python:

- **Definition:**

Variables are named containers used to store data values in programming languages.

- **Creation:**

In Python, a variable is created by assigning a value to it using the assignment operator (=).
For example:

Variable:

```
In [1]: #Lab 1 work 4th semester  
x = 10 # Assigns the value 10 to the variable x
```

Data Types of Variables:

Python supports various data types for variables:

The **equality operator (==)** is used to compare two values for equality. It returns True if the values are equal, otherwise False.

For example:

```
a = 5  
b = 7  
result = (a == b) # Evaluates to False
```

- **Integer Variable:**

Represents whole numbers (positive, negative, or zero).

Example:

```
age = 25
```

Floating-Point Variable

```
temperature = 98.6
```

- **String Variable:**

```
name = "khizzer"
```

- **Boolean Variable:**

```
is_sunny = True
```

1. Rules for Variable Names:

Variable names must start with a letter (a-z, A-Z) or an underscore (_).

They can contain letters, digits (0-9), and underscores.

Avoid using reserved words (e.g., if, else, while) as variable names.

2. Multiple Variable Declarations:

- **Single variable with multiple values:**

```
x, y, z = 10, 20, 30
```

- **Multiple variables with single values:**

```
a = b = c = 42
```

Arithmetic Operations:

- **Integer operations:**

```
num1 = 15
num2 = 7
sum_result = num1 + num2
difference_result = num1 - num2
product_result = num1 * num2
quotient_result = num1 / num2
```

- **Floating-point operations**

```
▶ pi = 3.14159  
radius = 5.0  
circumference = 2 * pi * radius
```

String Literal in Python:

- **Using Single Quotes:**

You can create a string in Python using single quotes like this:

```
'Hello, world!'
```

- **Using Double Quotes:**

Similarly, you can create a string using double quotes:

```
"Hello, world!"
```

- **Using Double Quotes with Single Quote Inside:**

If your string contains a single quote, you can use double quotes to define the string:

```
"It's raining"
```

- **Using Single Quotes with Double Quotes Inside:**

Likewise, if your string contains double quotes, you can use single quotes to define the string:

```
'He said, "Hello"'
```

The print() Function in Python:

- **Example of using the print() function to output a variable:**

You can use the **print()** function to display the value of a variable.

For example:

```
▶ x = 10  
print(x) # Output: 10
```

10

Example of outputting multiple variables with print():

You can print multiple variables separated by commas.

For example:

```
▶ x = 10  
  y = 20  
  print(x, y) # Output: 10 20
```

⇒ 10 20

Example of using f-strings to format output:

Python's f-strings provide a convenient way to format strings.

For example:

```
▶ name = 'khizzer'  
  age = 21  
  print(f"My name is {name} and I am {age} years old.")  
  # Output: My name is khizzer and I am 21 years old.
```

⇒ My name is khizzer and I am 21 years old.

Example of using f-strings to manipulate variables in output:

You can perform operations within f-strings to manipulate variables before printing.

For example:

```
▶ x = 5  
  y = 3  
  print(f"The sum of {x} and {y} is {x + y}.") # Output: The sum of 5 and 3 is 8.
```

The sum of 5 and 3 is 8.