

Week 1 Day 4: Python Basics

Variables and Data Types

In Python, variables are used to store information. They can hold different types of data.

- **Common Data Types:**
 - `int`: Whole numbers (e.g., `5`, `-3`)
 - `float`: Numbers with decimals (e.g., `3.14`, `-0.001`)
 - `str`: Text, enclosed in quotes (e.g., `"hello"`, `'world'`)
 - `bool`: Represents truth values, `True` or `False`
- **Variable Assignment:** Use the equals sign (`=`) to assign a value to a variable.
 - `user_age = 25`
 - `is_valid = True`
- **Naming Conventions:** Use descriptive, lowercase names with underscores (e.g., `first_name`, `item_price`).

Basic Operations

- **Arithmetic:** `+`, `-`, `*`, `/`, `//` (integer division), `%` (modulo), `**` (exponent).
- **Comparison:** `==` (equal to), `!=` (not equal to), `<`, `>`, `<=`, `>=`.
- **Logical:** `and`, `or`, `not`.

Control Structures

Control structures allow you to direct the flow of your program.

Conditionals: Make decisions with `if`, `elif` (else if), and `else`.

```
if age >= 18:  
    print("Adult")  
else:  
    print("Minor")
```

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- **Loops:** Repeat blocks of code.
 - `for`: Iterate over a sequence (like a list or range).
 - `while`: Repeat as long as a condition is true.

Functions

Functions are reusable blocks of code that perform a specific action.

- Define a function using `def function_name(parameters):`.

Use `return` to send a value back from the function.

```
def add(a, b):  
    return a + b
```

```
result = add(5, 3) # result is 8
```

Watch: Python Basics Tutorial

For a visual walkthrough of these concepts, search for a beginner-friendly "Python Basics Tutorial" on YouTube.

Activity: Python Basics Exercises

Complete the following tasks in a new code cell in your Jupyter Notebook.

1. **Area of a Rectangle:** Write a program that calculates and prints the area of a rectangle.
2. **Even or Odd:** Create a function `is_even(num)` that returns `True` if a number is even and `False` otherwise.
3. **Fibonacci Sequence:** Use a loop to print the first 10 numbers in the Fibonacci sequence.