Introduction to Python programming

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Outline

- Terminology
- Why Python?
- Data types
- Working with variables
- Functions, scripts, and modules
- Conditions
- Additional resources and content

Terminology

- Variable
- Function
- Return
- Script
- Modules and packages

Why Python? Getting started

- Free and open source
- General-purpose programming language
- Interpreted language
- Use cases and existing applications
  - **Web development** (e.g., Django and Flask)
  - **GUI development** (e.g., PyQt)
  - **Scientific and numeric** (e.g., Pandas)
  - **Software development** (e.g., Trac)
  - **System administration** (e.g., Ansible)

Data types

- String (str)
- Integer (int)
- Floating point number (float)
- List (list)
- Boolean (bool)

Working with variables

```
# Set the value of my_name to Ethan
my_name = "Ethan"

# Print the variable's value
print(my_name)

# Set the value of an age variable
age = 25

# Print a simple sentence
print(my_name, "is", age, "years old"

# Implicit type casting
age = 25.6
print("Next year,", my_name, "will be", age + 1, "years old")
age = "25"
```

Built-in functions and "for" loops

```
# The range() function returns a sequence of numbers
# Use integer values: range(start, stop, step)


# Example
for number in range(0, 10):
    print(number)
```

Creating a function and writing a script

```
def avg_two_numbers(num_1, num_2):
    sum_two_nums = num_1 + num_2
    avg = sum_two_nums / 2
    return avg
input_1 = float(input("Enter the first number: "))
input_2 = float(input("Enter the second number: "))
average = avg_two_numbers(input_1, input_2)
print(f"The average of {input_1} and {input_2} is {average}")
```

Using modules

```
# "import random" (without the quotation marks) would also import
# everything from random

from random import *

# Initialize the pseudo-random number generator
seed(a=25)

# Generate a random integer
generated_number = randint(0, 100)

# The library would need to be specified if imported directly
# Example: generated_number = random.randint(0, 100)

# Print the value
print(generated_number)
```

Conditions

- ==
- !=
- < and >
- <= and >=

```
if True:
    print("This first statement will print once.")
elif 0 > 1:
    print("This statement will never run.")
else:
    print("This statement will never run while the first condition is true.")
```

Additional Resources

- **Coding is political** and **Coding for social justice**
- **freeCodeCamp**
- **Harvard University**: CS50's Introduction to Programming with Python
- **Kaggle** (e.g., Python)
- **Python 3 documentation** and **Python for non-programmers**
- **Saylor Academy**: Introduction to Python
- **Swarthmore College**: Python reference
- **University of Helsinki**: Python Programming (Introduction to Programming and Advanced Course in Programming)