Welcome to the CoGrammar

Skills Bootcamp: Using Built in Functions and Defining your own functions.

The session will start shortly...

Questions? Drop them in the chat. We'll have dedicated moderators answering questions.

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Cyber Security Session Housekeeping

- The use of disrespectful language is prohibited in the questions, this is a supportive, learning environment for all - please engage accordingly. **(Fundamental British Values: Mutual Respect and Tolerance)**
- No question is daft or silly - **ask them!**
- There are **Q&A sessions** midway and at the end of the session, should you wish to ask any follow-up questions. Moderators are going to be answering questions as the session progresses as well.
- If you have any questions outside of this lecture, or that are not answered during this lecture, please do submit these for upcoming Academic Sessions. You can submit these questions here: **Questions**

Cyber Security Session Housekeeping cont.

- For all **non-academic questions**, please submit a query: **www.hyperiondev.com/support**

- We would love your **feedback** on lectures: **Feedback on Lectures**

- Find all the lecture **content** in you **Lecture Backpack** on GitHub.

Safeguarding & Welfare

We are committed to all our students and staff feeling safe and happy; we want to make sure there is always someone you can turn to if you are worried about anything.

If you are feeling upset or unsafe, are worried about a friend, student or family member, or you feel like something isn't right, speak to our safeguarding team:

Ian Wyles
Designated Safeguarding Lead

Simone Botes

Nurhaan Snyman

Rafiq Manan

Ronald Munodawafa

Tevin Pitts

Scan to report a safeguarding concern

or email the Designated Safeguarding Lead:
Ian Wyles
safeguarding@hyperiondev.com

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Stay Safe Series:

Mastering Online Safety One week at a Time

While the digital world can be a wonderful place to make education and learning accessible to all, it is unfortunately also a space where harmful threats like online radicalization, extremist propaganda, phishing scams, online blackmail and hackers can flourish.

As a component of this BootCamp the *Stay Safe Series* will guide you through essential measures in order to protect yourself & your community from online dangers, whether they target your privacy, personal information or even attempt to manipulate your beliefs.

Trustworthy Websites: How to Spot Secure Sites

When browsing online, it's crucial to identify secure and trustworthy websites. Look for URLs that start with HTTPS, as the 'S' indicates a secure connection. A padlock icon in the address bar also signifies a valid security certificate. Ensure the URL is spelled correctly and check for clear contact information, including a physical address and phone number. Additionally, legitimate websites provide privacy policies detailing how they handle your data. By following these guidelines, you can protect yourself from fraudulent sites and ensure a safer online experience.

Learning Objectives & Outcomes

- Identify and recall built-in Python functions such as print(), len(), and input().
- Describe the components of a function (defining, parameters, return statements).
- Create and call user-defined functions to perform specific operations.
- Examine the scope of variables within functions.
- Assess the efficiency and readability benefits of using functions.

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Using Built-in Functions & Defining Your Own Functions

October 2024

Functions

Just like a recipe provides a set of instructions to create a dish, a function provides a set of instructions to perform a specific task or calculation in a program

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Polls

Please have a look at the poll notification and select an option.

What does the len() function do in python?

A. Returns the length of a string or list
B. Finds the largest number in a list
C. Converts date into a string
D. Terminates a program

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Polls

Please have a look at the poll notification and select an option.

What built in function takes user input in python?

A. input()
B. len()
C. print()
D. sum()

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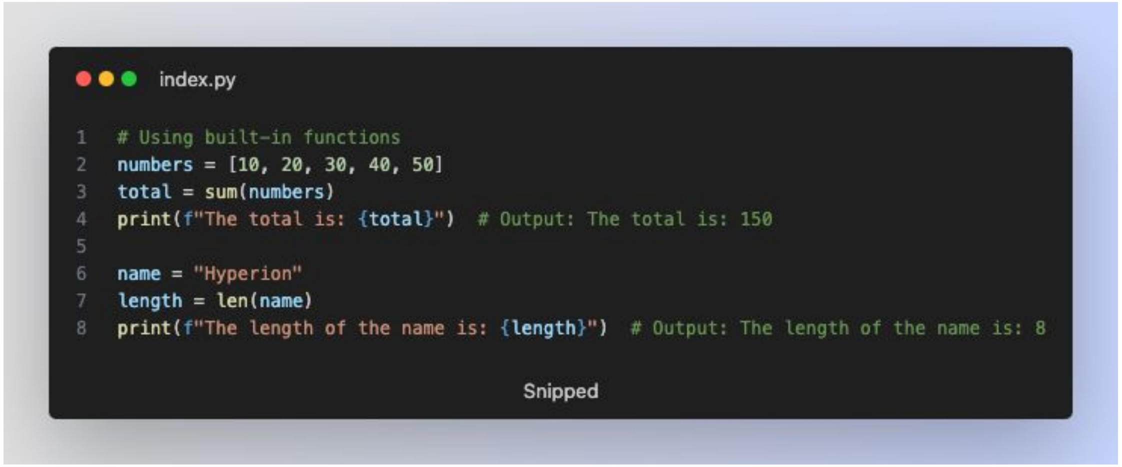
Functions

- A function is a reusable block of code that performs a specific task.
- Functions are useful in the following ways:
    - Encapsulates logic
    - Makes code modular
    - Makes code organised
    - Makes code easier to read

Built-in Functions

- These are functions that are readily available for use without needing to define them. (e.g len(), input())



```python
# Using built-in functions
numbers = [10, 20, 30, 40, 50]
total = sum(numbers)
print(f"The total is: {total}")  # Output: The total is: 150

name = "Hyperion"
length = len(name)
print(f"The length of the name is: {length}")  # Output: The length of the name is: 8
```

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User-Defined Functions

- Functions that you create yourself to perform specific tasks that are not provided by the built-in functions.
- Parts of the function:
  - Function name
  - Function definition/body
  - Function Call
- We use the def keyword followed by the function name, parenthesis (which may include parameters), and a colon to create a function.

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Parameters vs Arguments

- Parameters are the variables listed inside the parentheses in the function definition. They act as placeholders for the values that will be passed to the function when it is called

- Arguments are the actual values or data you pass to the function when calling it. These values replace the parameters defined in the function during the function call.

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Let’s take a break

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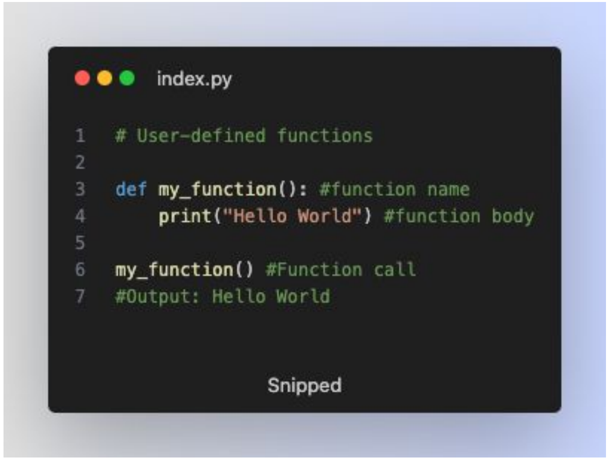
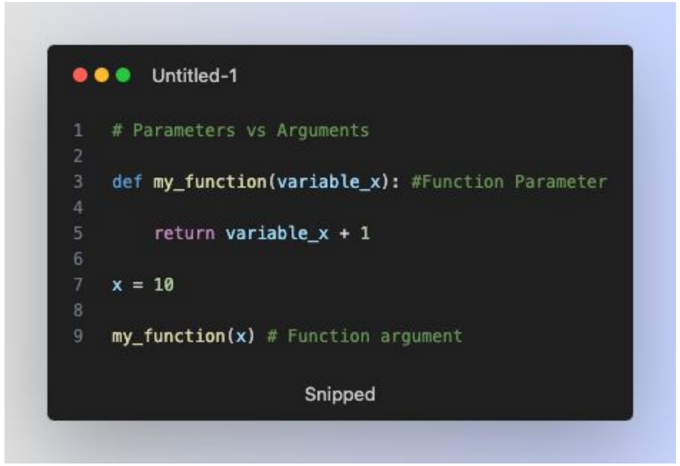
User-defined Functions



```python
# User-defined functions

def my_function(): #function name
    print("Hello World") #function body

my_function() #Function call
#Output: Hello World
```



```python
# Parameters vs Arguments

def my_function(variable_x): #Function Parameter

    return variable_x + 1

x = 10

my_function(x) # Function argument
```

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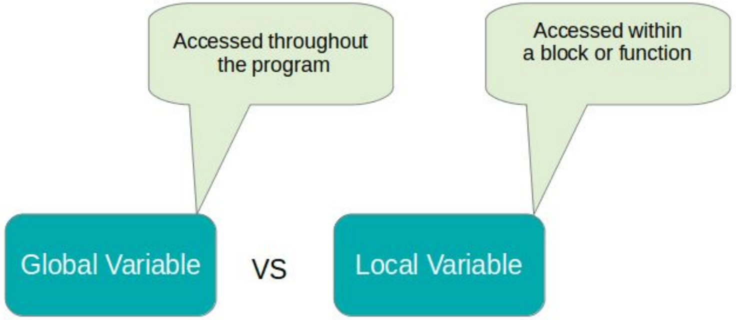
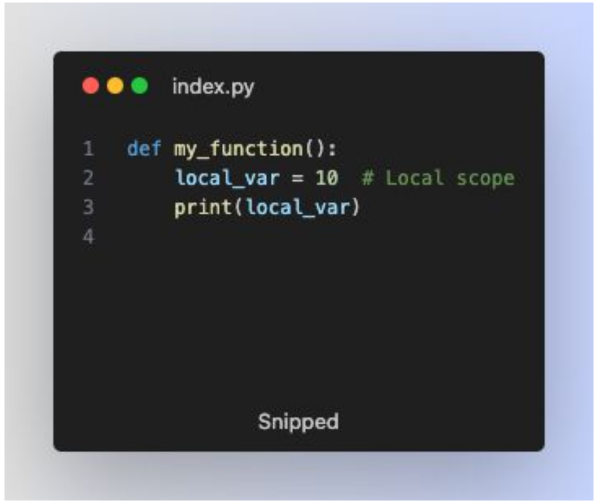
Scopes in python

- Scope refers to the visibility and lifetime of variables in a program.


Accessed throughout the program
Accessed within a block or function
Global Variable
VS
Local Variable

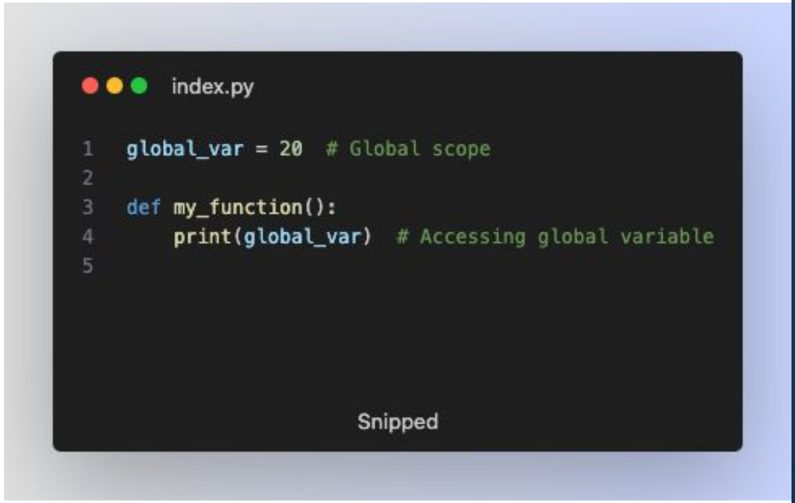
Scopes in python


index.py

```python
def my_function():
    local_var = 10  # Local scope
    print(local_var)

```

Snipped


index.py

```python
global_var = 20  # Global scope

def my_function():
    print(global_var)  # Accessing global variable

```

Snipped

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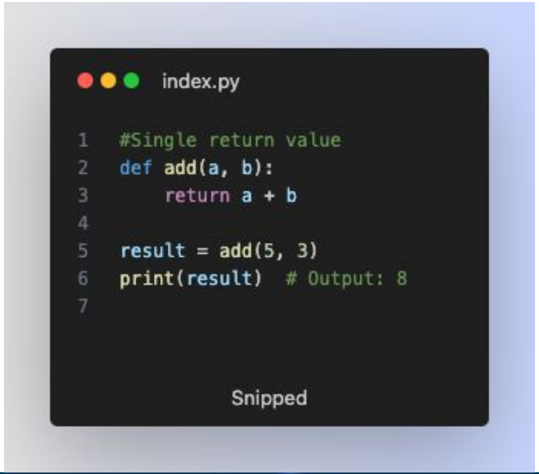
Return Values in Functions

- A return value is the output that a function produces after it has finished executing.
- When a function reaches a return statement, it exits, and the value specified in the return statement is sent back to the caller.



```python
#Single return value
def add(a, b):
    return a + b

result = add(5, 3)
print(result)  # Output: 8
```

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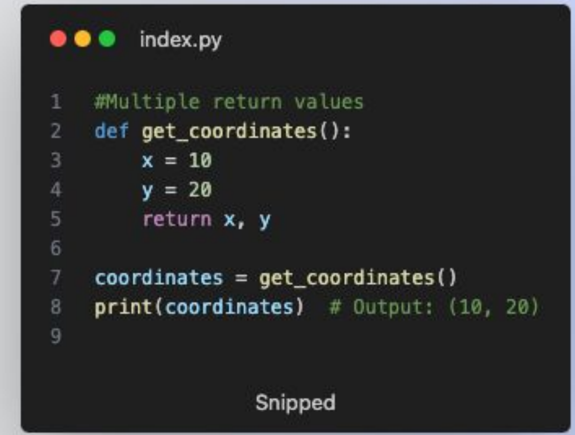
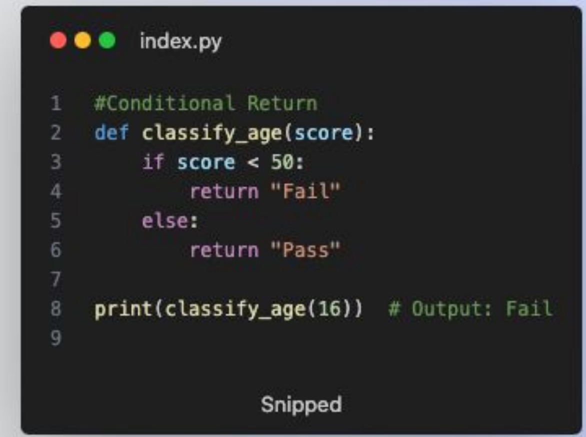
Types of Return values.


index.py

```python
#Multiple return values
def get_coordinates():
    x = 10
    y = 20
    return x, y

coordinates = get_coordinates()
print(coordinates)  # Output: (10, 20)
```

Snipped


index.py

```python
#Conditional Return
def classify_age(score):
    if score < 50:
        return "Fail"
    else:
        return "Pass"

print(classify_age(16))  # Output: Fail
```

Snipped

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Polls

Please have a look at the poll notification and select an option.

Why would you create a user-defined function instead of using a built-in function

A. To avoid repetitive code
B. Built-in functions are too slow
C. Custom functions provide more flexibility and can handle specific tasks
D. Built-in functions are unreliable

Polls

Please have a look at the poll notification and select an option.

Which of the following scenarios demonstrates an understanding of function scope in Python?

A. A variable declared within a function can be accessed and modified directly from outside the function without any special declarations.
B. A nested function can access variables from its enclosing functions' scope, but those variables cannot be modified directly.
C. A global variable declared before a function can only be read inside the function but cannot be modified unless declared with the global keyword.
D. A function can be called before it is defined in the code as long as the function name is known.

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Conclusion & Summary

- Functions enhance code modularity, reusability, and readability.
- Built-in functions are efficient for common operations, while user-defined functions offer flexibility for specialised tasks.
- Proper use of functions is essential for writing clean and maintainable code.
- Functions in Python are like laws: they take inputs (arguments), process them using well-defined rules (the function body), and produce an outcome (return value).
- Just as laws apply equally to all, functions process inputs the same way every time, ensuring fairness and consistency in the results.

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Questions and Answers

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Thank you for attending

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