Welcome to this CoGrammar session:

Functions and APIs

The session will start shortly…

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

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Software Engineering 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**

Software Engineering Session Housekeeping cont.

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

- Report a **safeguarding** incident: **www.hyperiondev.com/safeguardreporting**

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

Skills Bootcamp
8-Week Progression Overview

✅ Criterion 3: Course Progress

- ***Completion:*** All mandatory tasks, including Build Your Brand and resubmissions by study period end
- ***Interview Invitation:*** Within 4 weeks post-course
- ***Guided Learning Hours:*** Minimum of 112 hours by support end date (10.5 hours average, each week)

✅ Criterion 4: Demonstrating Employability

- ***Final Job or Apprenticeship Outcome:*** Document within 12 weeks post-graduation
- ***Relevance:*** Progression to employment or related opportunity

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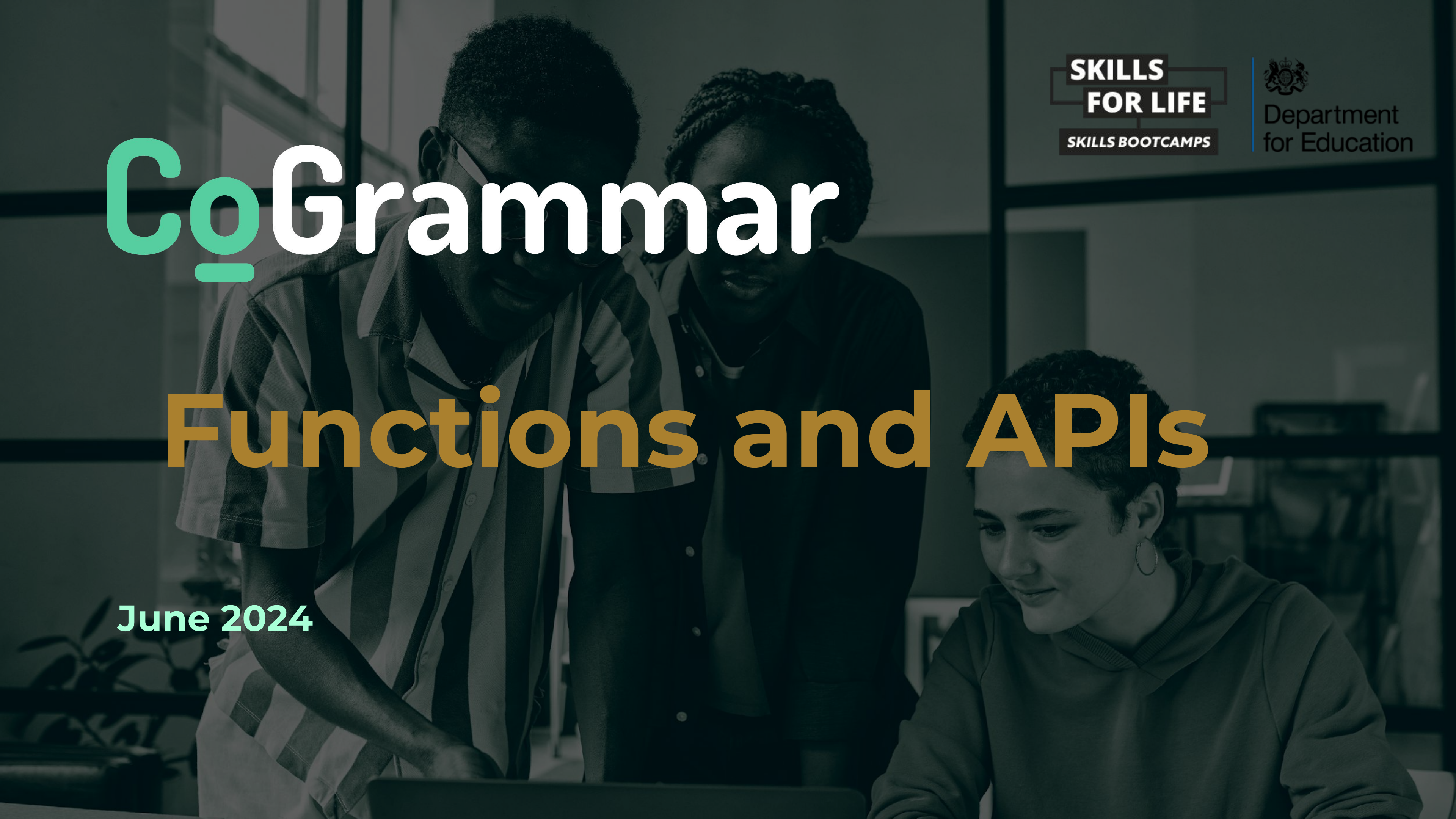
Learning Outcomes

- Explain what functions are.
- Explain what user defined functions are.
- Use built-in functions within their projects.
- Create user-defined function within their projects.
- Explain what APIs are.
- Explain what the python requests module is.
- Utilise the requests module to make calls to API endpoints.
- Utilise the data from API calls within their programs.



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Functions and APIs

June 2024

What are Functions?

- Functions are reusable blocks of code that perform specific tasks.
- Called methods when used in OOP Classes.
- Functions help organise code, make it more readable, and facilitate debugging and maintenance.
- Useful for abstraction.
- Similarity to functions in maths, f(x) takes input x and produces some output.

Calling Functions?

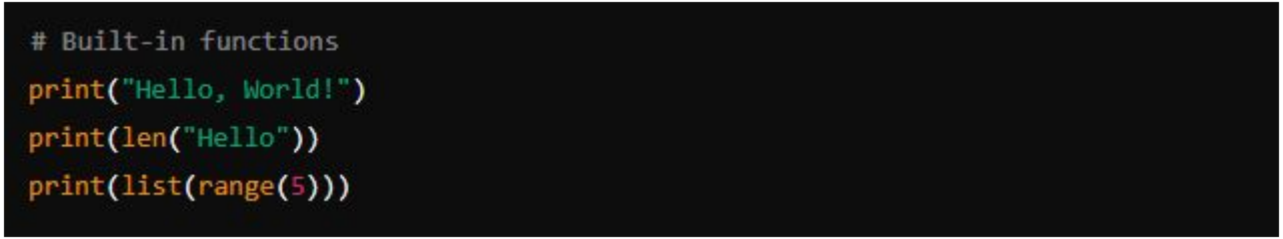
- Functions with one required positional input:
  - my_function(input1)
- Functions with two required positional inputs:
  - my_function(input1, input2)
- Functions with one required positional input and one optional keyword input:
  - my_function(input1, **keyword_arg**=input2)

Why Use Functions?

- Code Reusability: Write once, use multiple times.
- Modularity: Break down complex problems into simpler pieces.
- Maintainability: Easier to update and fix issues in a modular codebase.
- Abstraction: Hide complexity and expose simple interfaces.
- Error checking/validation: Makes this easier, as you can define all rules in one place.

Using Built-In Functions

- Python provides numerous built-in functions for common tasks.
- Examples: print(), len(), and range()



```python
# Built-in functions
print("Hello, World!")
print(len("Hello"))
print(list(range(5)))
```

More Python Functions

- The list of functions that you can use in Python doesn’t just stop with what is built in.
- Using Pip (python package manager), you can install various packages containing modules.
- To search for packages, visit https://pypi.org/
- Some packages are already installed by default in Python, such as the Math package.
- These modules can be imported into your script using an import statement.

More Python Functions

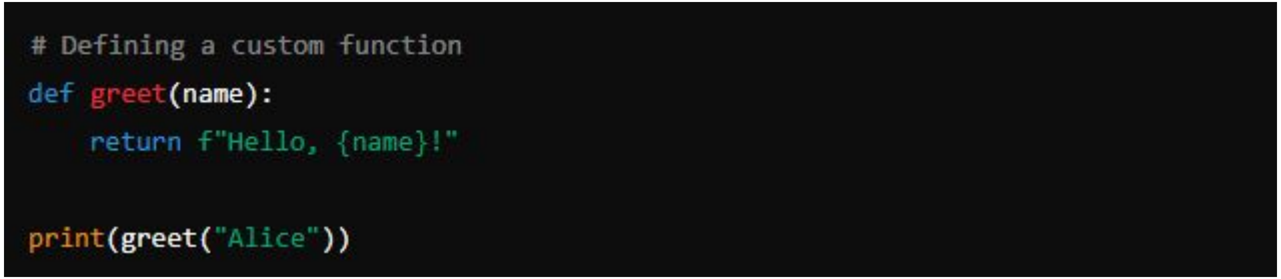
- Let’s take a look at the maths module. Let’s say that you want to use round(), which rounds a number off.
- There are multiple ways to access this:
  - import math –or- from math import *

    my_result = math.round(my_num, 2)
  - from math import round

    my_result = round(my_num, 2)

Creating Custom Functions

- Use the def keyword to define a function.
- Define a function to greet a user.

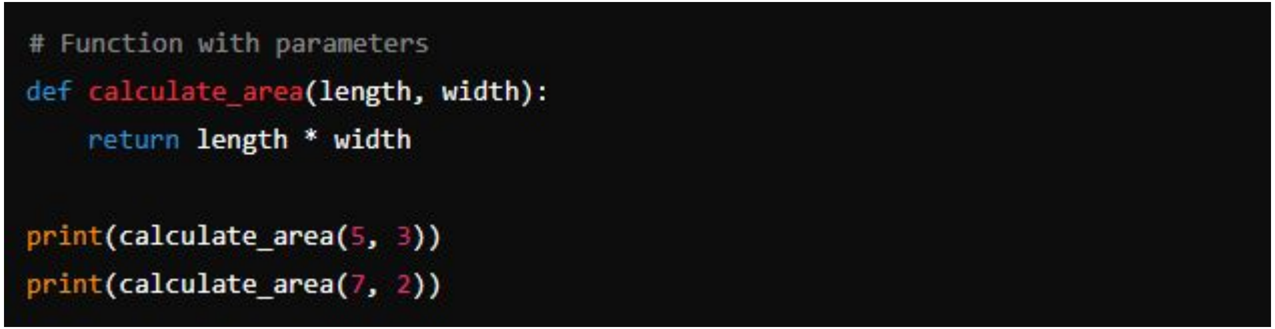


```python
# Defining a custom function
def greet(name):
    return f"Hello, {name}!"

print(greet("Alice"))
```

Functions with Parameters

- Functions can accept inputs through parameters.
- Example: Calculate the area of a rectangle.

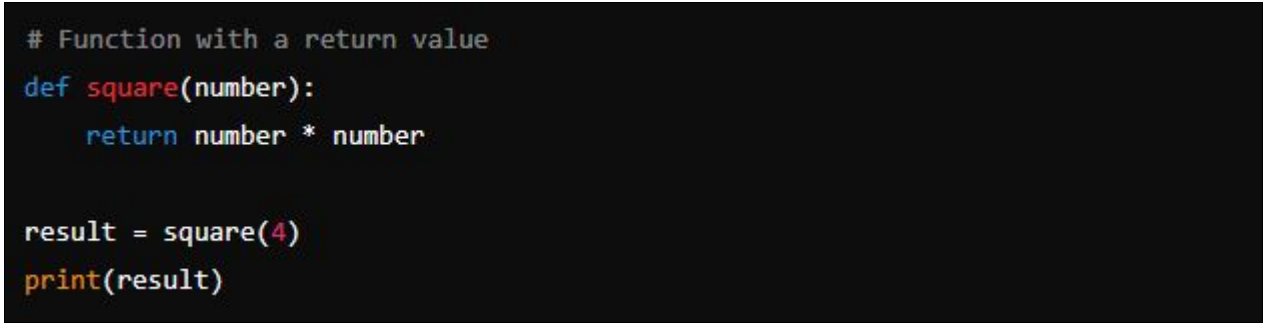


```python
# Function with parameters
def calculate_area(length, width):
    return length * width

print(calculate_area(5, 3))
print(calculate_area(7, 2))
```

Functions with Return Values

- Use the return statement to return a result from a function.
- Example: Return the square of a number.



```
# Function with a return value
def square(number):
    return number * number

result = square(4)
print(result)
```

APIs

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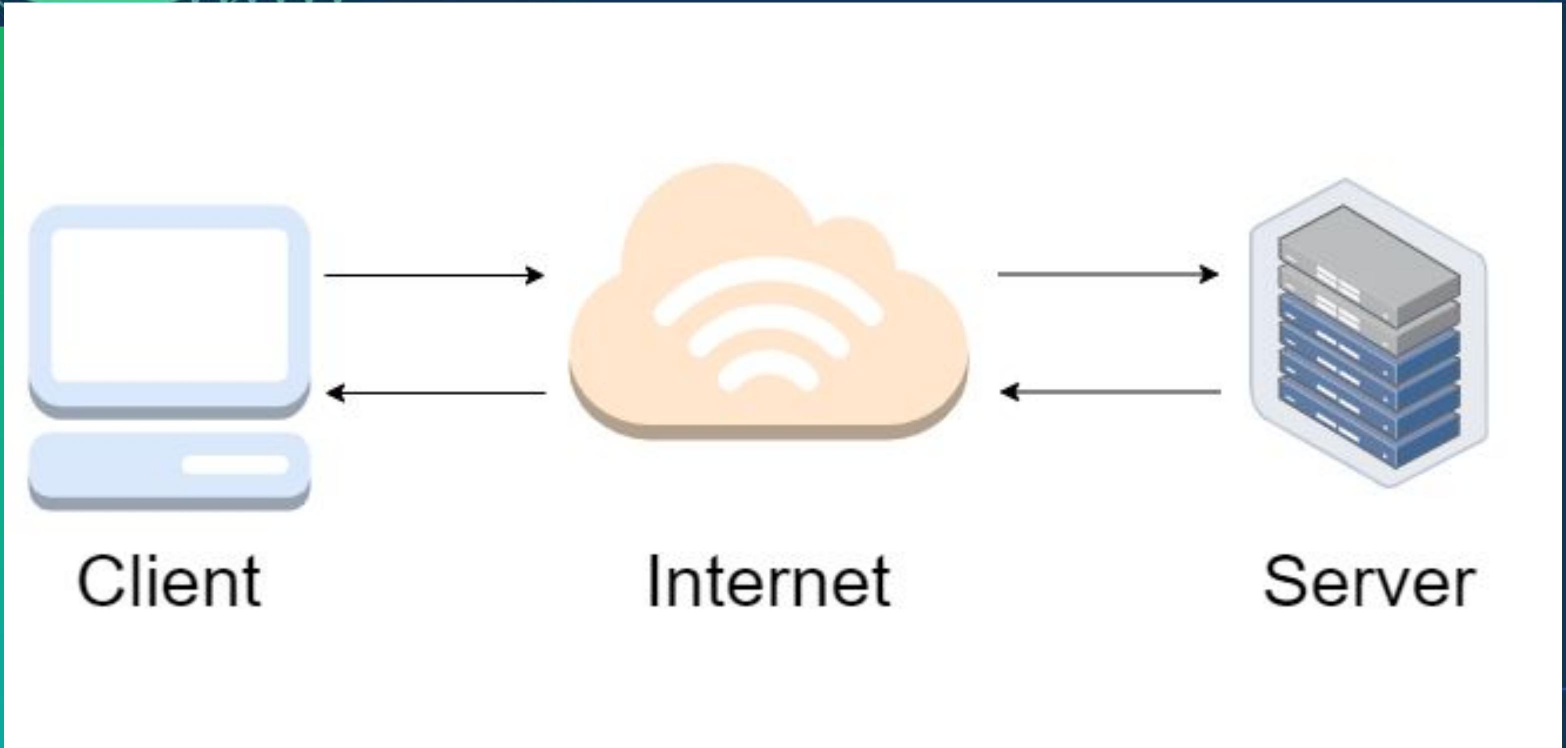
APIs

- **API:** Application Programming Interface – Interface that provides a set of functions to a user where the underlying mechanism of that function is hidden.

- **Web API:** It is an API that travels through the internet. Usually called client-server architecture.

Web APIs



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API Terminologies

Integration: API integration refers to the process of **connecting** two or more **applications** or **systems** by using **APIs** (Application Programming Interfaces) to **exchange data** and **perform actions.**

Call: The process of **sending** a **request** to your API after setting up the right **endpoints**

Monetization: API monetization is a process by which a business can create **revenue** from its **APIs**.

HTTP and Status Codes

HTTP

HTTP : **H**yper**T**ext **T**ransfer **P**rotocol

https://www.google.com/search/q=python

200

400

500

REST

{REST}

Representational State Transfer

Endpoint

Method

Header

Body

https://dummy.restapiexample.com/

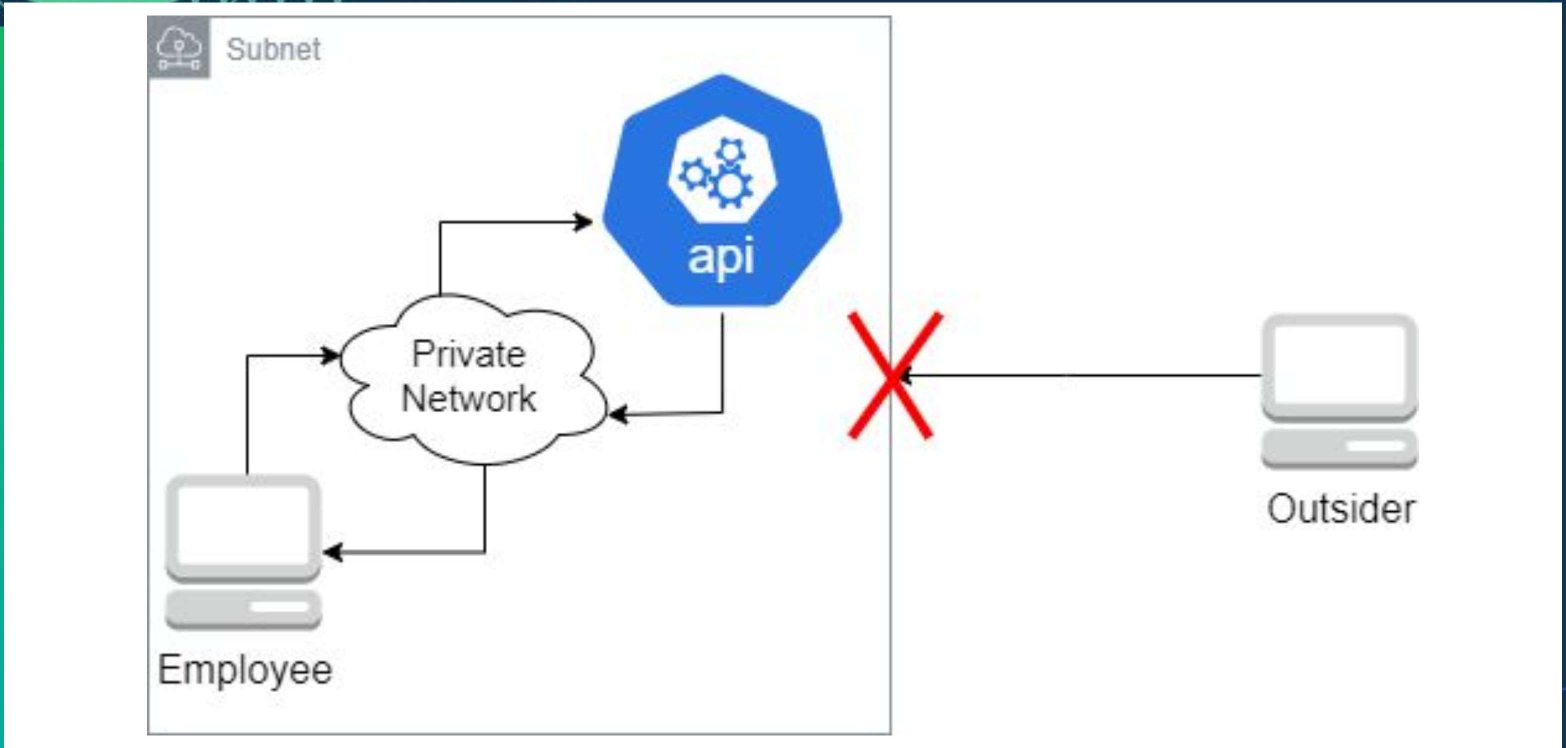
HTTP Payload Format

xml Payload {.json}

```
<?xml version="1.0" encoding="UTF-8"?>
<root>
    <name>Tim</name>
    <age>23</age>
    <salary>50000</salary>
</root>
```

```
{
    "name: "Tim",
    "age: "23",
    "salary: "50000"
 }
```

API Types



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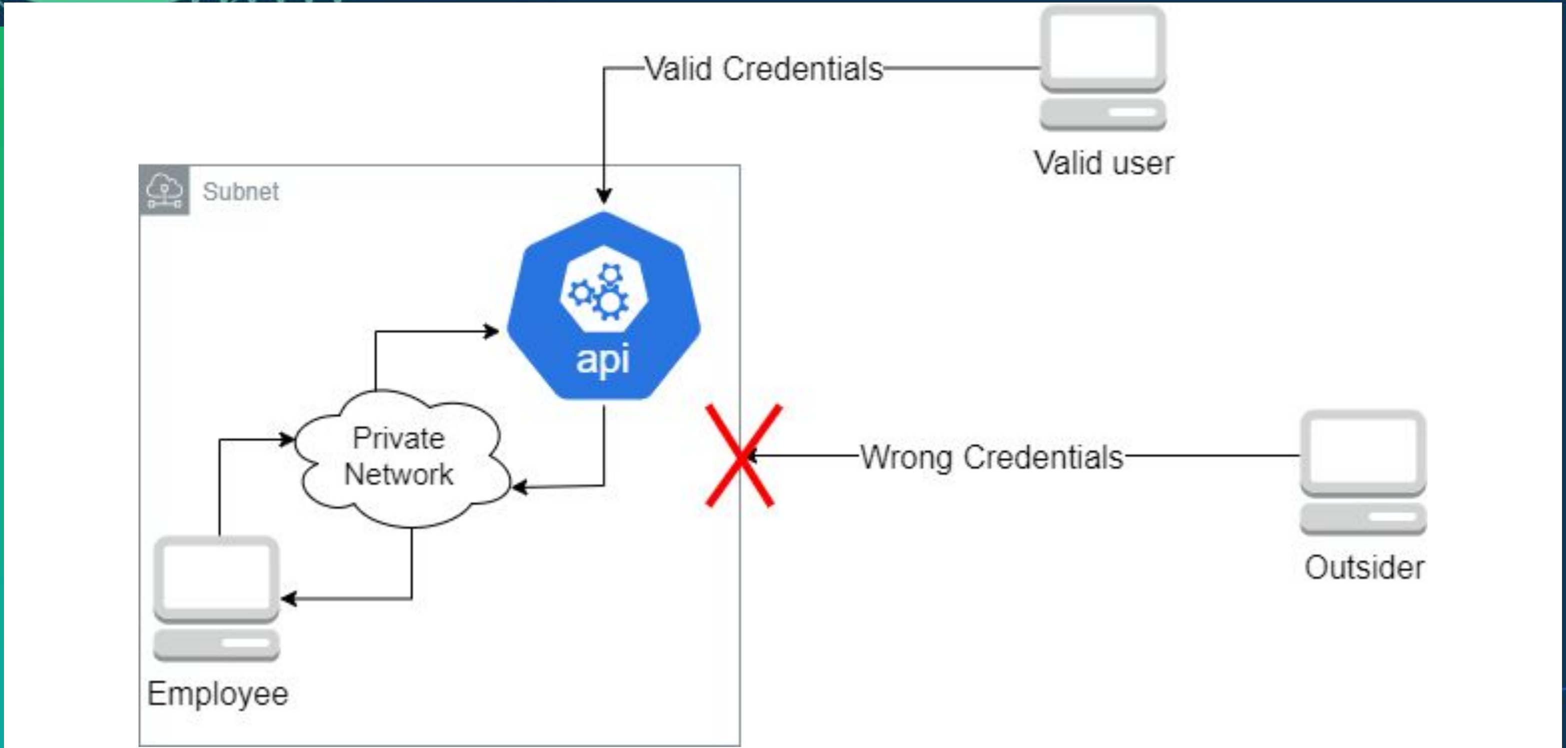
API Types



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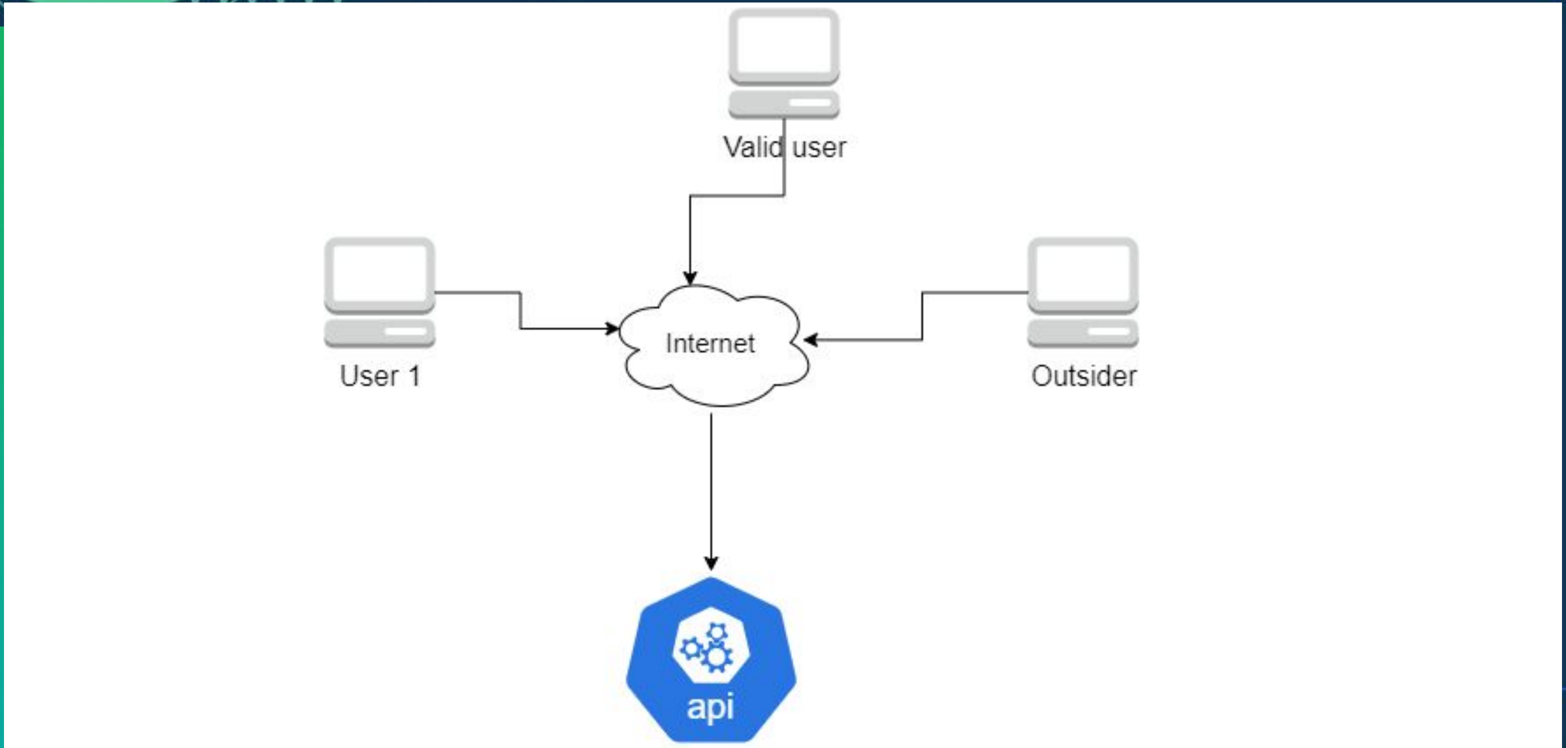
API Types



Let’s get coding!

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Final Assessment

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Polls

- *Refer to the polls section to vote for you option.*

What is the primary purpose of the Python requests module?

a. To send HTTP requests

b. To manage file I/O operations

c. To create graphical user interfaces

d. To perform mathematical calculations

Polls

- *Refer to the polls section to vote for you option.*

Which attribute of the response object contains the status code of the HTTP response?

a. response.status

b. response.code

c. response.status_code

d. response.http_code

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Lesson Conclusion and Recap

Lesson Conclusion and Recap

- Functions: We can group code together and call to it whenever we need it. Benefits code reuse, organisation and maintenance as well as allow for abstraction.
- APIs: The Glue of the Digital World: APIs (Application Programming Interfaces) act as bridges between software systems, enabling seamless communication, data exchange, promoting interoperability and integration.
- RESTful Foundations: REST (Representational State Transfer) is a common architectural style for APIs, using HTTP methods (GET, POST, PUT, DELETE) to interact with resources.
- Consuming APIs: With Python’s requests library, we can send HTTP requests to interact with APIs, retrieving data with GET requests and sending data with POST requests.

Thank you for attending

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