Welcome to this CoGrammar session:

Getting Started with Python

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** throughout this session, should you wish to ask any follow-up questions.
- 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

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Enhancing Accessibility: Activate Browser Captions

Why Enable Browser Captions?

- Captions provide **real-time text for spoken content**, ensuring inclusivity.
- Ideal for individuals in noisy or quiet environments or for those with **hearing impairments**.

How to Activate Captions:

1. YouTube or Video Players:
   - Look for the CC (Closed Captions) icon and click to enable.
2. Browser Settings:
   - Google Chrome: Go to *Settings > Accessibility > Live Captions* and toggle ON.
   - Edge: Enable captions in *Settings > Accessibility.*

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 or Step 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 radicalisation, extremist propaganda, phishing scams, online blackmail and hackers can flourish.

As a component of this BootCamp the *Stay Safe Series* is designed to 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.

Skills Bootcamp Progression Overview

✓ Criterion 1 - Initial Requirements

Specific achievements within the first two weeks of the program.

To meet this criterion, students need to, by no later than 01 December 2024 (C11) or 22 December 2024 (C12):

- **Guided Learning Hours** (GLH): Attend a minimum of 7-8 GLH per week (lectures, workshops, or mentor calls) for a total minimum of 15 GLH.
- **Task Completion:** Successfully complete the first 4 of the assigned tasks.

✓ Criterion 2 - Mid-Course Progress

Progress through the successful completion of tasks within the first half of the program.

To meet this criterion, students should, by no later than 12 January 2025 (C11) or 02 February 2025 (C12):

- **Guided Learning Hours** (GLH): Complete at least 60 GLH.
- **Task Completion :** Successfully complete the first 13 of the assigned tasks.

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Skills Bootcamp Progression Overview

✓ Criterion 3 – End-Course Progress

Showcasing students' progress nearing the completion of the course.

To meet this criterion, students should:

- **Guided Learning Hours** (GLH): Complete the total minimum required GLH, by the support end date.
- **Task Completion** : Complete all mandatory tasks, including any necessary resubmissions, by the end of the bootcamp, 09 March 2025 (C11) or 30 March 2025 (C12).

✓ Criterion 4 - Employability

Demonstrating progress to find employment.

To meet this criterion, students should:

- **Record an Interview Invite:** Students are required to record proof of invitation to an interview by 30 March 2025 (C11) or 04 May 2025 (C12).
  - **South Holland Students** are required to proof and interview by 17 March 2025.
- **Record a Final Job Outcome** : Within 12 weeks post-graduation, students are required to record a job outcome.

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SKILLS FOR LIFE

SKILLS BOOTCAMPS

Department for Education

Getting Started with Python

Polls

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Poll

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

1. How do you think programming can solve problems?
   a. By manually fixing issues on the computer
   b. By providing step-by-step solutions on a paper guide
   c. By writing code that automates tasks

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Poll

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

2. Why is learning to think logically important for programming?

    a. It helps you memorise code faster

    b. It makes your code look more organised

    c. It helps you solve problems systematically

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Learning Outcomes

- Describe how computers work (Input -> Processing -> Output)
- Define programming, algorithm, variable (definition and naming convention), syntax, comments and why they are needed.
- Differentiate between primitive and non–primitive data types
- Declare variables using different data types in Python.
- Perform basic operations using the data types.
- Perform basic boolean operations using the truth table
- Write and execute conditional statements using if, elif, and else.

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Hello World!

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NETLIX
IMAGINED WITH AI IMAGINED WITH AI

How Computers Work?

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How Computers Work?
Basic Fruit Smoothie - Use Case

Ice

Banana

Strawberry

Orange Juice

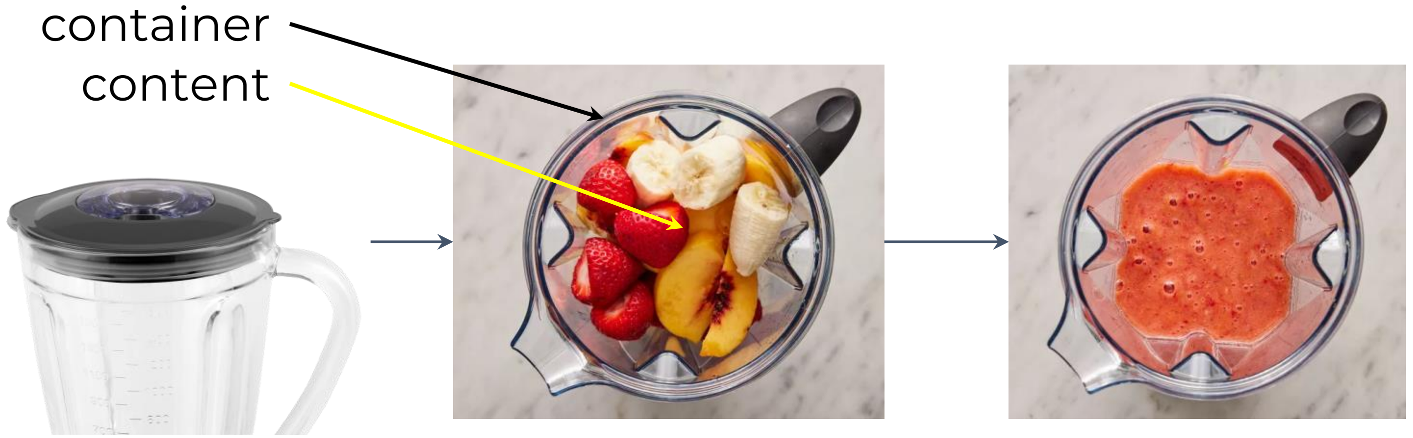
Peach

Input

container

content

How Computers Work?
Basic Fruit Smoothie - Use Case



Processing

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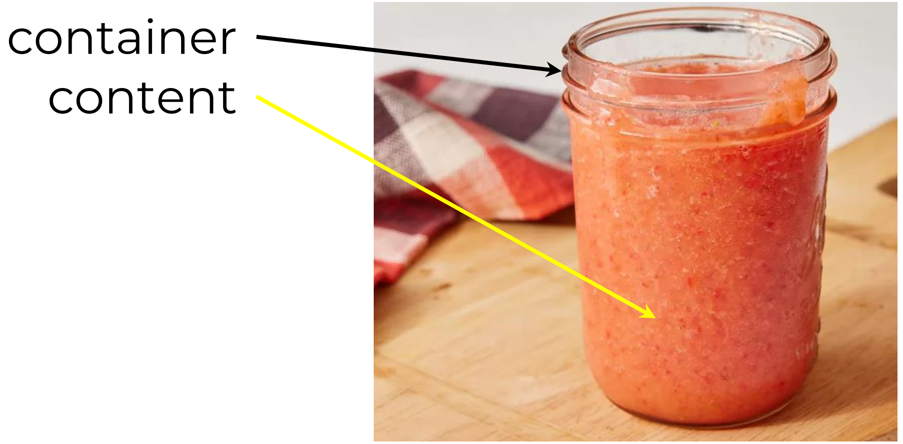
How Computers Work?
Basic Fruit Smoothie - Use Case



Output

Basic Programming Concepts

Programming Basics

```
        if lang is None:
            raise Exception("Input language could not be determined")
            return None
    parsedInput = self.parseInputToLanguageModel(inputString, inputLanguage, [illegible]
    if not parsedInput or not self.model:
        return None
    context.append(parsedInput) # Add new conversation entry to context
    return (self.model.generateLLMOutput(parsedInput), context)

def parseInputToLanguageModel(inputString, inputLanguage, context):
    if self.model is None or self.model.language != inputLanguage:
        # LLM is not initalised or has wrong language, load LLM
        self.model = self.loadAILanguageModelFromDatabase(inputLanguage)
        if self.model is None or not self.runModelSelfDiagnosticTests():
            raise Exception("AI language model load failed")
            return None
    self.model.setLLMContext(context) # Put past conversation context into [illegible]
    llmInputParser = self.model.getInputParser()
    return llmInputParser.parseInput(inputString)

def generateLLMOutput(parsedInput):
    llmContext = self.model.getLLMContext()
    bytecodeResponse = self.model.convertInputToIntermediateResponse[illegible]
    if bytecodeResponse is None:
        [illegible] failed to produce intermediate re[illegible]
```

Programming is the process of writing instructions that a computer can understand and execute to perform specific tasks.

An algorithm is a step-by-step set of instructions designed to perform a specific task.

Syntax: the rules for writing code and
Comments: the notes for the programmer.

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Programming Basics: Variables

- A Variable is the memory location used to store data, which can be changed or used later in the program.
- snake_case is a variable naming convention where each word is in lower case, and separated by underscores.
- Python reserved words designate special language functionality. No other variable can have the same name as these keywords. eg print, as, for, like, def, or, class, is to name a few.

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Programming Basics: Variables

```
drink_name = "smoothie"

banana_juice = 12.0

orange_juice = 30.0

strawberry_juice = 20.5

mix_juice = banana_juice + orange_juice + strawberry_juice

print(f"You have {mix_juice} litres of {drink_name} .")
```

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Data Types

Data Types and Variables in Python

A data type is a **characteristic** of a variable that tells a computer system **how to interpret** the value of a piece of data.

Primitive Data Types				Non-Primitive Data Types			
Primitive data types are the most basic data types. They are the building blocks for more complex data types.				Non-primitive data types (also known as complex or composite data types) are built upon primitive data types.			
int	float	bool	string	list	set	tuple	dict
1, -1	3.14, -1.0	True, False	"Hello"	[1,2]	{1, 'a'}	(1.0,0)	{'x':0.1, 'y':0.2}

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Conditional Statements

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Boolean Logic

Boolean values:

True, False

Operators:

and:	Both conditions must be true
or:	At least one condition must be true
not:	Inverts the boolean value

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Boolean Logic and Truth Tables

Let **A** and **B** be booleans expressions, either **True** or **False**

A	B	A & B	A | B	NOT A
False	False	False	False	True
False	True	False	True	True
True	False	False	True	False
True	True	True	True	False

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Conditional Expressions

Comparison Operators

==	: Equal to
!=	: Not equal to
<	: Less than
>	: Greater than
<=	: Less than or equal to
>=	: Greater than or equal to

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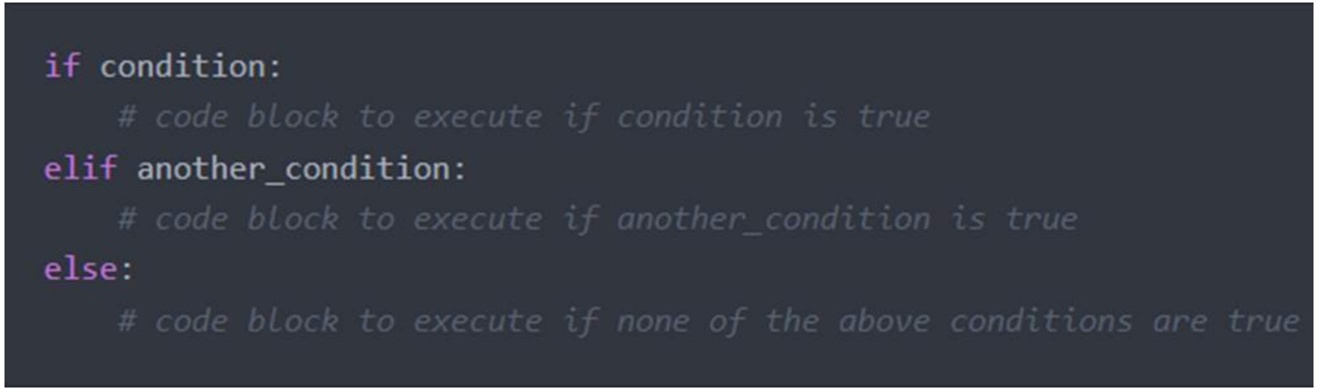
Conditional Statements

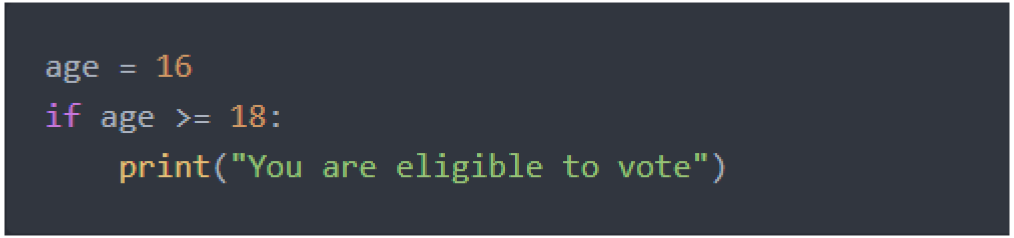
Conditional statements help your program make decisions and adapt its behaviour accordingly. There are primarily three types of conditional statements in programming:



```
if condition:
    # code block to execute if condition is true
elif another_condition:
    # code block to execute if another_condition is true
else:
    # code block to execute if none of the above conditions are true
```

Conditional Statements

- if statement
  - It executes a block of code if the specified condition is true.
  - Otherwise it skips the block of code



```python
age = 16
if age >= 18:
    print("You are eligible to vote")
```

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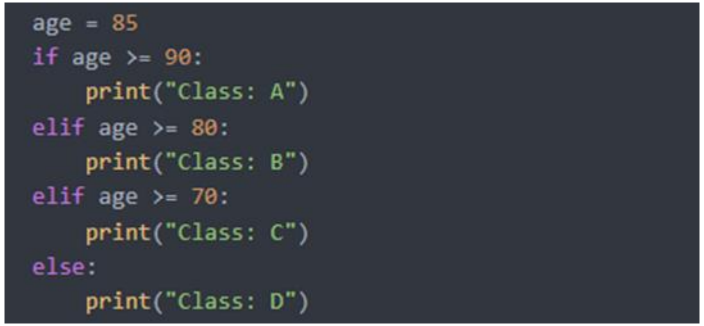
Conditional Statements

- if-else statement
  - It executes a block of code if the specified condition is true.
  - Otherwise it executes the block of code in the else section.

```python
age = 16
if age >= 18:
    print("You are eligible to vote")
else:
    print("You are not eligible to vote yet")
```

Conditional Statements

- if-elif-else statement
  - It executes a block of code if the specified condition is true.
  - Otherwise it executes the block of code in the elif section
  - If all elif conditions are false then it executes the else code block.



```
age = 85
if age >= 90:
    print("Class: A")
elif age >= 80:
    print("Class: B")
elif age >= 70:
    print("Class: C")
else:
    print("Class: D")
```

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Let’s take a short break

Let’s get coding!

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Polls

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Poll

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

1. **Which of the following conditional statements will correctly check if a number is greater than 10 and less than 20 in Python?**
    a. if number > 10 or number < 20:
    b. if number > 10 and number < 20:
    c. if 10 < number < 20:
    d. Both b and c

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Poll

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

2. What will the following code output?

```
x = True
y = False
print(x and not y)
```

a. True
b. False
c. None
d. It will raise an error

Conclusion and Recap

- Running Python Scripts: Executing Python scripts from the terminal and VS Code. Illustrated running a “Hello World” script.
- Basic Programming Concepts: Understanding programming fundamentals, including algorithms, variables, and syntax.
  - Explained their roles with examples.
- Conditional Statements and Boolean Logic: Using if, elif, and else for decision-making and boolean operators for logic.
  - Demonstrated with practical examples.

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Learner Challenge

1. Objective: You’re building a simple checkout system for an e-commerce store. When a customer checks out, they need to enter their age, total order price, and account balance. The system will categorise them into an age group and apply a discount if they qualify. Then it will check if the balance is sufficient to complete the purchase, taking into account any applicable discounts.
2. Steps to Implement:
   - Take User Inputs:
     a. Get the customer's age, total order price, and account balance.
   - Categorise Age and Apply Discount:
     a. If the customer is aged 18-25, apply a 10% discount.
     b. If the customer is aged 26-60, apply a 5% discount.
     c. If the customer is under 18 or over 60, no discount is applied.
   - Calculate Discounted Price:
     a. Adjust the total order price based on the applicable discount.
   - Check Balance:
     a. Compare the customer’s account balance with the discounted price.
     b. If the balance is enough, proceed with the order.
     c. If the balance is insufficient, calculate the shortfall and inform the user.

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Additional Resources

- Software
  - https://www.python.org/downloads/
  - https://code.visualstudio.com/download
- Additional Resources
  - HackInScience — Python Exercises
  - https://www.codewars.com/
- Books
  - https://greenteapress.com/wp/think-python-2e/
  - https://python.land/introduction-to-python/variable

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Questions and Answers

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Thank you for attending

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