Welcome to the CoGrammar

Skills Bootcamp:
Thinking Like A Programmer - Pseudo Code

The session will start shortly...

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

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

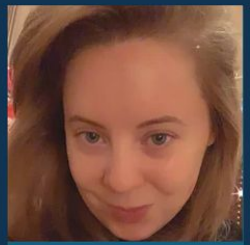
We are committed to all our students and staff feeling safe and happy; we want to make sure there is always someone you can turn to if you are worried about anything.

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

Rafiq Manan



Charlotte Witcher

Nurhaan Snyman

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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Learning Objectives & Outcomes

- Define pseudo code and identify its uses in programming.
- Explain the purpose of pseudo code in problem-solving and program design.
- Write pseudo code to solve basic programming problems.
- Break down a complex problem into smaller, logical steps using pseudo code.
- Assess the effectiveness of their pseudo code by comparing it with others.
- Design pseudo code for a given problem, considering edge cases and alternative approaches.


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Have you ever faced a challenge when trying to solve a problem or complete a task and did not know where to start?

What is Pseudo Code?

- Pseudo code is a simple, plain-English way of describing steps to solve a problem.
- In programming, it is not actual code but rather a tool to plan the logic of a program.
- Helps programmers think through problems and structure solutions before coding.

Example: Instructions for making a sandwich

- Start
- Take two slices of bread
- Spread butter on both slices of bread
- Add filling of choice (e.g. Ham/Cheese)
- Close the sandwich with both slices
- End.

Polls

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

Have you ever used pseudo code before?

A. Yes
B. Unsure
C. Never

Polls

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

What do you think pseudo code is?

A. A written representation of code logic
B. A type of programming language
C. A design tool to plan programs.

Why use Pseudo Code?

- Simplifies problem solving: Breaks down a complex problem into smaller, manageable steps.
- Helps ensure logic flow: You can spot issues in your approach early.
- Improves communication: Easier to explain your solution to others without needing to understand specific programming languages.
- Prepares you for coding: Ensures that you have a clear plan before jumping into writing code.

Pseudo Code Basics

- Use short, clear statements that represent actions
- No need for syntax: Focus on the logic, not the specific programming language.
- Follow logical steps: Ensure each step flows naturally from the previous one.
- Avoid over complications: Keep it simple, just enough detail to understand the steps.

Example: Detecting Phishing Attempts in emails.

- In the Questions Tab, Write a pseudo code for detecting phishing attempts in emails.
- Think about the steps you would take, and keep the pseudo code simple.

Phishing: Definition

- Phishing is a type of cyber attack where a malicious actor disguises themselves as a trustworthy entity, typically through email, text message, or website, to trick individuals into providing sensitive information such as usernames, passwords or credit card details.

Pseudo Code

- Start
- Open the Email
- Check if the sender is a known contact
- If unknown, check for signs of phishing (e.g. Strange links, requests for personal information)
- If phishing signs are found flag the email as suspicious.
- End

Key Tips for Writing Pseudo Code

- Use your everyday language.
- Include essential details
- Test the flow: Imagine someone following your pseudo code–would it work?
- Focus on the process: Don’t worry about actual programming languages.

Let’s take a break
To stretch and relax

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Evaluating Pseudo Code

- Clarity: Are the steps easy to follow?
- Completeness: Does it cover all the necessary steps?
- Logic: Do the steps flow in the right order?
- Ask yourself: Could someone else read this and understand what to do?

Example 2: Find the Sum of All Even Numbers Between 1 and N

- In the Questions Tab, Write a pseudo code for finding the Sum of All Even Numbers Between 1 and N
- Think about the steps you would take, and keep the pseudo code simple.

Pseudo Code Basics

- Start
- Input a number N
- Set sum to 0
- For each number from 1 to n:
  - If the number is even (i.e. number / 2 has a remainder of 0)
  - Add the number to sum
- Output the sum
- End

Code example: What to expect.

index.py

```python
#Step 1: Start
# Step 2: Input a number N
N = int(input("Enter a number: "))

# Step 3: Initialize sum to 0
total_sum = 0

# Step 4: Loop through numbers from 1 to N
for num in range(1, N + 1):

    # Step 5: Check if the number is even
    if num % 2 == 0:

        # Step 6: Add the even number to the total_sum
        total_sum += num

print(total_sum)
```

Snipped

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THINKING LIKE A PROGRAMMER

- The most important skill for a programmer is problem-solving
- Involves:
  - Formulating problems
  - Thinking creatively
  - Expressing solutions clearly and accurately
- Programming is not just a skill, it is an opportunity to practice problem-solving.

THINKING LIKE A PROGRAMMER

- Computers run code step by step and line by line, they cannot jump around or skip steps.
- As a programmer, you are required to provide all necessary inputs (like numbers) before asking the computer to process or compute.

Polls

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

What is the main benefit of writing pseudo code before solving a problem?

A. Helps solve problems faster
B. Makes the logic easier to understand
C. Avoid bugs in the final code
D. Provides a ready-to-use template for writing code in any programming language.

Polls

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

In the context of cybersecurity, how can pseudo code help identify malware?

A. By showing the steps involved in scanning for malware
B. By writing the final code to run the antivirus
C. By automatically detecting and removing malware from the system
D. By encrypting sensitive data to prevent malware attacks.

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.

Keep it Secret, Keep it Safe: Why Passwords Should Stay Private

- Passwords act as the first line of defense against cyberattacks, ensuring that only you have access to your sensitive accounts and data.
- Sharing your passwords or using weak, easily guessable ones increases the risk of unauthorized access, leading to potential identity theft, financial loss, or privacy breaches.
- It's important to create **strong**, **unique passwords** for each account and keep them confidential to stay safe online.
- Always remember:
    - Your password is personal—keep it private to protect yourself!

Summary

- Pseudocode is an important tool to plan and organize your thoughts before coding
- It helps break down problems into smaller, manageable steps
- Writing clear and logical pseudo code can make programming much easier.
- Use pseudo code to practice thinking like a programmer even if you're not yet writing actual code.

Questions and Answers

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Thank you for attending

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