




# Welcome to the CoGrammar

## 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

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- 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.

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- For all **non-academic questions**, please submit a query:  
[www.hyperiondev.com/support](http://www.hyperiondev.com/support)
- Report a **safeguarding** incident:  
[www.hyperiondev.com/safeguardreporting](http://www.hyperiondev.com/safeguardreporting)
- We would love your **feedback** on lectures: [Feedback on Lectures](#)

# 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  
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or email the Designated  
Safeguarding Lead:  
Ian Wyles

[safeguarding@hyperiondev.com](mailto:safeguarding@hyperiondev.com)

# 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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# CoGrammar

## CyberSecurity

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# CyberSecurity

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**





# 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

1  #Step 1: Start
2  # Step 2: Input a number N
3  N = int(input("Enter a number: "))
4
5  # Step 3: Initialize sum to 0
6  total_sum = 0
7
8  # Step 4: Loop through numbers from 1 to N
9  for num in range(1, N + 1):
10
11     # Step 5: Check if the number is even
12     if num % 2 == 0:
13
14         # Step 6: Add the even number to the total_sum
15         total_sum += num
16
17 print(total_sum)
```

Snipped

# 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.

# Summary

- Pseudo code 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





# Thank you for attending



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