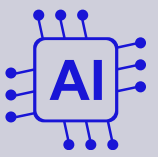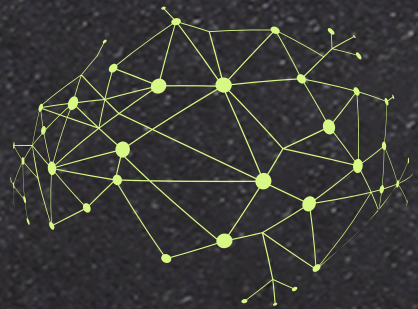# Integrating Generative AI (GenAI) in Higher Education: Embedding AI into Coding Assessments

Introduction

This case study highlights the integration of AI, notably ChatGPT, into coding assessments to enhance students' critical thinking and problem-solving skills. By generating, analysing, and refining AI-produced code, students gain practical experience with AI tools while addressing their limitations. This approach prepares them for AI's role in modern workflows, emphasising responsible and effective usage.
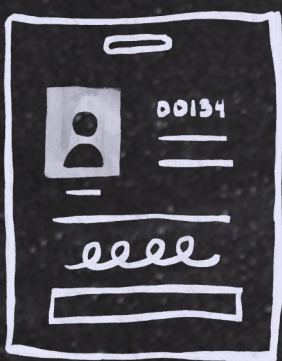
Why is this exercise useful?

- Builds critical thinking and problem-solving skills.
- Teaches ethical and effective AI use.
- Prepares students for AI-driven workflows.
- Enhances coding and prompt-crafting abilities.
- Encourages recognising and improving AI limitations.

Methods

- Goal: To help students develop skills in Python programming, code testing, profiling and optimisation while fostering algorithmic thinking.
- Students are provided with a framework containing a skeleton Python model and tasked with completing the following: code development, code profiling, code optimisation, and reflection and discussion. AI is an integral part of the task as students are asked to use AI to refine the code and reflect on the output. ChatGPT 3.5 was chosen for its widespread familiarity, accessibility and consistency.
- Students are assessed on code functionality (12 Marks) and critical discussion and analysis (18 Marks) - for critical approach to analysis, refining and optimising the code. Additional marks are provided for identifying and correcting errors in ChatGPT's output, incentivising students to actively engage with AI.

Key factors for an effective implementation

- Ensure a clear method for submitting AI interactions
- Define consequences for non-compliance with submission guidelines
- Ensure equal access to AI tools for all students
- Test AI tools and assessments before launch
- Monitor and limit the impact of your AI interactions
- Encourage critical engagement with AI output
- Provide guidelines for ethical AI use
- Clarify the role of AI in the assessment process

Quotes from Students

- An example of how a student used AI for debugging:
  - 'I was trying to debug codes and found that Chat GPT has become good at being able to do that, especially when it's just small things like human error tends to miss like oh, missing a comma, or missing hyphen' (Hana, FG7)

- An example of how clear rules are required when AI is to be used in assessment, to avoid any confusion:
  - 'Just at least from a college perspective, when it's your degree, then we need to have more clear rules. I understand that it keeps changing...' (Anika, FG5)

- An example of how educators can positively incorporate Gen AI in teaching:
  - 'If an educator was to use GenAI in a positive way, I do think it's something that would be positive because I think we're taught especially in a kind of old fashioned [or] traditional lectures, it's very technology averse. It's nice to have someone who's kind of embracing that side of things as well' (Kamal, FG7).