ANGLO EUROPEAN SCHOOL

A-Level Computer Science Bridging Project 2024

Computer Science is a hands-on subject where you apply classroom theories to real-world systems. It's a highly creative field that blends invention with excitement, offering a digital perspective on the natural world. OCR's A Level in Computer Science focuses on computational thinking, helping you develop problem-solving skills, design systems, and understand the strengths and limitations of both human and machine intelligence.

This bridging the gap project has two parts, a programming challenge and a research project.

Part 1 – Programming challenge

Choose **1** of the following challenges and solve it using:

- A flowchart
- Pseudocode
- Programme code (any high-level language will do, you may wish to try out a different language to test yourself, but Python is fine)

Challenge 1:	**Useful Resources:**
Password reset program Only accept a new password if it is: 1. At least eight characters long 2. Has lower case and upper case letters. The password reset program should also make the user input their new password twice so that the computer knows that the user has not made any mistakes when	▪ **OCR Python Guide** https://www.ocr.org.uk/Images/390478programming-techniques-pythonteacher-guide.docx ▪ **OCR Pseudocode guide** https://www.ocr.org.uk/Images/260952pseudocode-guide.pdf ▪ **School shared area**

typing their new password. **Extensions:** 1. Make some sort of algorithm to suggest how strong the password is (Weak, Medium, and Strong) depending on length, whether or not the password has special characters in etc. 2. Let the user input their username. The program should go to a text file with a list of usernames and old passwords, and the program should only let you change your password if you input your old password.	

Part 2 – Research project

Same as before, choose 1 of the following:

Types of processor

Research and explain the main features of the **Von Neumann Architecture** and the **Harvard Architecture**. Draw suitable diagrams for each, identifying the main differences.

Next, look into the differences between **RISC** and **CISC** Processors, Draw out tables to show the differences between the two.

Finally, Research into the uses of **GPUs**, obviously graphics, but what else?

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Legal, Moral, Ethical and Cultural Issues

Responsibility of Social Networking Sites for Posted Content

Networking sites like Facebook, Twitter, and Ask.com often feature content that is angry, violent, or inaccurate. Should these platforms be held accountable for the content posted by their users? What types of content should be permitted, and could software be developed to manage this responsibility effectively? This discussion explores the ethical and practical implications of content moderation on social media.

The Impact of Computerisation on Employment

Over the next decade, computerisation is expected to lead to the disappearance of numerous jobs, including those in manufacturing, clerical work, and even service sectors where robots may replace human workers. Beyond these examples, what other jobs might be lost due to technological advancements? This section examines potential job losses and their social implications, exploring how communities and economies might be affected by the shift towards automation and artificial intelligence.

Algorithms

Research into Big O Notation and how it is used within algorithms Next Research into Dijkstra's Shortest Path and also the A* Algorithms.

Note down how these algorithms compare to those you studied at GCSE.

Useful web links?

Below are links to websites that contain useful material that we shall be covering on the course. Familiarise yourself with the first couple of topics from the specification.

Isaac Computer Science
OCR A Level Specification
Computing 101

Any issues?

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