NHGS SIXTH FORM

A LEVEL TRANSITION WORK

A Level Computing

Specification Link

OCR - A-Level Computer Science H446
https://www.ocr.org.uk/Images/170844-specification-accredited-a-level-gce-computer-science-h446.pdf

Overview - Course Content

Computer systems (01) Duration: 2 hours 30 mins Weighting: 40% **Topics** • The characteristics of contemporary processors • Input, output and storage devices • Software development • Exchanging data • Data types • Data structures and algorithms • Legal, moral, cultural and • ethical issues	**Algorithms & Programming (02)** Duration: 2 hours 30 mins Weighting: 40% **Topics** • Elements of computational thinking • Problem solving and programming • Algorithms to solve problems and standard algorithms.	**Programming project (03)** Non-exam assessment. Weighting: 20% **Topics** Students will be expected to analyse a problem (10 marks), and design (15 marks), develop and test (25 marks), and evaluate and document (20 marks) a program. The program must be to solve it written in a suitable programming language.

Recommended Reading - Watching

Videos

YouTube - Craig n Dave - https://www.youtube.com/@craigndave
YouTube - Computer Science Lessons - https://www.youtube.com/@ComputerScienceLessons
YouTube - Mr Brown CS - https://www.youtube.com/@MrBrownCS
YouTube - Teaching CS - https://www.youtube.com/@teachingcs
Website - Isaac Computer Science - https://isaaccomputerscience.org/

Textbook

Hodder Education: OCR A-Level Computer Science (George Rouse, Jason Pitt, Sean O'Byrne)

Revision Guide

Hodder Education: My Revision Notes OCR A-Level Computer Science (George Rouse, Jason Pitt, Sean O'Byrne)

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Reading

- Computer Science: An Overview (J.Glenn Brookshear - Dennis Brylow)
- But How Do It Know: (J.Clark Scott)
- Code: (Charles Petzold)

Transition Activities

Task 1

Using resources listed above such as Craig and Dave and Isaac Computer Science, plus your own research and personal views. Create a 5 minute presentation on one of the topics listed below:

- The ethics of AI
- The environment impact of technology
- How social media effects society
- Technology and it's impact of the planet's resources

Please make sure that the presentation is available for your first lesson. You will be presenting to the group. You should ensure that it is either emailed to the teacher before the lesson or you have it available on a USB stick.

Task 2

Create a program in Python that will validate if an ISBN number has been entered correctly. You should use the maths of modulus 11 to calculate the check sum.

The procedure for calculating the check digit, which may be carried out automatically in a computer, is as follows:

1. Take the first seven digits of the ISSN (the check digit is the eighth and last digit): 0 3 1 7 8 4 7
2. Take the weighting factors associated with each digit : 8 7 6 5 4 3 2
3. Multiply each digit in turn by its weighting factor: 0 21 6 35 32 12 14
4. Add these numbers together: 0+21+6+35+32+12+14 = 120
5. Divide this sum by the modulus 11: 120:11 =10 remainder 10
6. Substract the remainder from 11: 11-10 = 1
7. Add the remainder, which is the check digit, to the extreme right (low order) position of the base number of the ISSN: 0317-8471

If the remainder is 10, substitute an upper case X in the check digit position. If there is no remainder, put a zero in the check digit position.

Provide an image of your code on the last slide of the activity in Task 1. You will be asked to explain how you have tackled the coding problem.