

## Progression from GCSE to A-Level Computer Science

OCR A-Level Computer Science qualification consists of two written papers and a Programming project

- Computer Systems
- Algorithms & Programming

To prepare for A-Level Computer Science, please complete as many of the following challenges as possible:

### Challenge 1:

Write a robust python program for a game of your choice that:

- Gives the user 3 lives at the start of the game.
- Allows the user to play the game until their have no lives left.
- They should move onto the next level for every 5 points they earn.
- The game is complete when they receive 20 points.
- At the end of the game it should tell the user which level they got up to.

### Challenge 2:

Write a robust python program for the process described below.

A primary school teacher wants a computer program to test the basic arithmetic skills of her students. The program should generate a quiz consisting of a series of random questions, using in each case any two numbers and addition, subtraction and multiplication. The system should ask student's name, then ask 10 questions, output if the answer to each question is correct or not and produce a final score out of 10.

Scores from the quiz should be stored and added to when a student takes a new quiz.

### Challenge 3:

Write a robust python program for the scenario mentioned below.

- Petrol costs £1.40 per litre. Diesel costs £1.55 per litre. LPG costs £0.95 per litre.
- Ask the user for which type of fuel their car uses and how much they have put into it.
- Calculate the correct price of the fuel they have taken.
- Ask how much money they have handed over and calculate the amount of change they are due.
- Finally, ask them if they have a loyalty card and if they do calculate how many points they should have added to it using the following – 1 point for every litre of fuel they've taken plus 1 point for every full pound they've paid.
- If the number of points they get is more than 100 they get a bonus 10% extra points.
- The number of points should then be outputted

#### **Challenge 4:**

Read the following articles about Edward Snowden and answer the following question:

*Do you think Edward Snowden was right to reveal the secret documents to which he had access, being legally forbidden to do so under the US Espionage Act 1917?*

Justify your answer

#### *References:*

- Andrew Keen 'The Internet is not the Answer' Atlantic Books, London, 2015
- Glenn Greenwald, 'No Place to Hide: Edward Snowden, the NSA and the Surveillance State', McLelland and Stewart, 2014
- Luke Harding 'The Snowden files: The Inside Story of the World's Most Wanted Man', Vintage Books, 2014.

#### *Websites:*

- <http://www.theguardian.com/world/2013/jun/06/nsa-phone-records-verizon-court-order>
- <http://www.nybooks.com/articles/archives/2013/nov/21/snowden-leaks-and-public/>