A Level Computer Science

Contents

Links to key course material

● Exam board website. This website contains further information about your course, including assessment materials and other useful resources –

AS and A Level - Computer Science - H046, H446 - OCR

● Course specification. This document (which you should save a copy of) details the requirements of the course, including what you will learn, and how you will be assessed –

OCR A Level Computer Science H446 Specification

Core texts:

● OCR AS and A Level Computer Science - September 2016. PM Heathcote and RSU Heathcote (Authors), Publisher: PG Online Ltd, ISBN: 978-1-910523-05-6. We would recommend purchasing this by the beginning of the course. Please note that although the current edition is required, academic textbooks are often expensive, and it is advisable to shop around for deals and to look for second-hand copies.

Companion texts:

● OCR A Level Computer Science (includes AS Level) - April 2015. Sean O'Byrne, George Rouse, Jason Pitt (Authors), Publisher: Hodder Education, ISBN: 9781471839764

● AS/A Level Computer Science for OCR Student Book - October 2017. Alistair Surrall and Adam Hamfleet (Authors), Publisher: Cambridge University Press, ISBN: 9781108412711

Pre-course reading/watching:

The programming project contributes to 20% of your final A Level grade. You will have the chance to showcase your programming skills. The following resources are useful in order to review or update your expertise.

1. Python Tutorial - Python Full Course for Beginners(6 hours)- Python Tutorial - Python Full Course for Beginners (youtube.com)

2. Game Development using pygame (2 hours)- Game development for beginners using Pygame [Part 1] - The Debuggers

3. Introduction to game development using C# and unity (2 hours)- Introduction to Game Development with Unity and C# - Simple Talk (red-gate.com)

Useful websites:

- Computer Science Revision - PMT (physicsandmathstutor.com)
- Introduction to Python (Learning Path) – Real Python
- Learn Python - Free Interactive Python Tutorial
- Welcome to Python.org (You can download Python from this website)
- Keep up to date with latest tech developments. BBC Click is a good place to start. BBC News - Click - Episode guide

Pre-course work:

Complete the summer work and have it ready to submit in September.

In this task you get to investigate any area of emerging computer technology which interests you. You can pick any area which interests you from the following:

• Artificial intelligence

• Robotics

• Automated self-driving cars

• Quantum computing

Summarise the area you have chosen under the following four headings:

1. What is it?

2. What are the possible Social, Moral, Cultural and Ethical benefits of this technology on society

3. What are the possible Social, Moral, Cultural and Ethical risks of this technology on society

4. My conclusion on this technology and what it will mean for our world 10 years from now.

Programming Challenge:

Upload the screenshots of program and output screen. Refer Python Tutorial (w3schools.com) to avoid syntax errors in your programs.

Keyboard shortcut for screenshot: press windows, shift, s or use a snipping tool.

1.

Write a python program to do the following:

If the temperature is greater than 30, output “Too hot”.

If the temperature is between 21 and 30, output “Just right”

Otherwise output “A bit chilly”

2.

Write a program which simulates throwing two dice and then outputs the number on each die and the total of the two dice.

4.

Write a python program for one or more selection statements to decide whether a year is a Leap year. The rules are:

A year is generally a Leap Year if it is divisible by 4, except that if the year is divisible by 100, it is not a Leap year, unless it is also divisible by 400. Thus 1900 was not a Leap Year, but 2000 was a Leap year.

5.

Write a Python program to score a throw of two dice. The throw of the dice should be simulated using a random number generator.

The rules are as follows:

A player throws two dice.

If the faces on the two dice are different, the score is the sum of the faces.

If the two faces are the same, the score is doubled, unless the throw is a double six, in which case the score is zero.

Print out the values of the two dice along with the final score.

6.

Write a python program which allows the user to enter their first name and surname. The program will then output their name in the format “initial surname”.

e.g. Input 1: “Jim”, Input 2: “Daley”, Output: “J Daley”

The program will also need to have the initial and first letter of the surname as capital letters. All other letters of the surname will need to be lowercase.

e.g. Input 1: “george”, Input 2: “garlAnd”, Output: “G Garland”

Assume the string in indexed from 0, so the first character in the string will be referred to as stringName[0].

Make use of concatenation and the following functions:

s.length	finds the length of s
s.upper	gives the uppercase of s
s.lower	gives the lowercase of s
s.right(n)	gives the right n characters of s
s.left(n)	gives the left n characters of s

7. A customer entering security details when logging in to a bank website is asked to enter three random characters from their password, which must be at least 8 characters long and contain no spaces. Assume that in this case the password is HC&dt2016.

The letters are then compared to those in the password held on file for that customer. Write a python program for this.