



The Thomas Hardy School

Summer Preparation Task

Computer Science A Level
OCR H446

Purpose of task(s):

Task 1 involves doing some research into Artificial Intelligence (AI) and documenting your findings in an essay. The purpose is to learn about some of the wider aspects of Computer Science and to develop your essay writing technique.

Task 2 is a programming task. You will need to design and implement a simple program and document your finished solution. The purpose of this task is to develop your programming skills and to learn about the process for designing and documenting a software project.

Task(s):

Task 1: Conduct some research into Artificial Intelligence and write an essay documenting your findings.

OR

Task 2: Design and develop a simple number guessing program or for a more advanced option a game of tic, tac, toe. Documenting your design and finished solution.

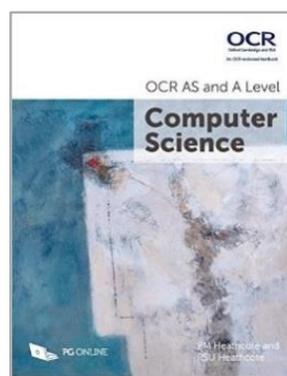
See below for details of each task.

Recommended resources:

<https://www.python.org>

<http://www.ocr.org.uk/qualifications/as-a-level-gce-computer-science-h046-h446-from-2015/>

Text Book: OCR AS and A Level
Computer Science – 12 Sep 2016 by
P M Heathcote and R S U Heathcote.



We are pleased you have chosen to study Computer Science. Computer Science involves the study of information in digital computers, the design of computer hardware and software, and the design of algorithms to solve problems. The course you will be studying is from the OCR exam board and consists of 2 exam modules: Computer Systems (01) and Algorithms and Problem Solving (02). Both of these modules are assessed by two 2 hour 30 minute examinations. In addition, in year 13 you will be expected to design and develop a system of your own choice, this Computer Science project will make up 20% of your final grade. The work will be entirely your own and your tutor will provide support.

<http://www.ocr.org.uk/qualifications/as-a-level-gce-computer-science-h046-h446-from-2015/>

We hope you enjoy your summer break and we look forward to seeing you in September. Please read carefully the details of the tasks below.

Deadline for Task: First lesson in week commencing 13th September 2021

Summer Tasks

You are expected to complete at least one the following tasks below in advance of commencing the course. You can choose to complete either task or both. The deadline is Monday 9th September.

The completed task should be submitted to your Computer Science teacher electronically – email: agannon@thomas-hardye.net

Task 1- Artificial intelligence – Research Task

Conduct some research on the impact of artificial intelligence (AI) on society and how this may change our lives in the future. Consider the opportunities and risks of this technology in the workplace, the effect on people's lives including health and quality of life. You should also think about the wider issues of the use of this technology in terms of the impact on the environment, privacy and censorship.

You should produce an essay of between 1000 - 1500 words. Your essay should contain 3 sections:

- 1) Knowledge of AI – Explain what you understand about AI. For example, what is AI and how does it differ from a conventional automated decision making system which relies on a pre-programmed algorithms? Examples of AI should be used to illustrate your knowledge.
- 2) Application of AI – How will AI affect society, in general, in the workplace, homes, hospitals. Think of particular examples to illustrate your research such as self-driving vehicles or robots that can learn, emphasise the risks and benefits.
- 3) Evaluation – You should provide a balanced evaluation of the main findings of your research and provide a sensible conclusion.

Deadline for Task: First lesson in week commencing 13th September 2021

Task 2 – Programming

By the end of year 12 you will be expected to be fairly proficient in a programming language. In year 13, you will be responsible for designing and developing a project of your own choice. The project needs to contain sufficient algorithmic complexity to meet the requirements of the A level specification.

Therefore, if you haven't programmed before, the task for the summer may require that you undertake some independent study in programming. The language used by most students for their project is Python – this can be downloaded for free from <https://www.python.org/>. However, you can choose a language of your own choice providing it meets the requirements, for example, a graphical programming language such as scratch would not be deemed sufficient.

Your task:

- 1) Make sure that you have some proficiency in the language you have chosen.
- 2) Write a number guessing game program. The program will ask the user to enter a maximum number eg 100, and then using the random library will select a random number between one and the maximum. The program will ask the user to guess the number and output if the guessed number is higher or lower than the actual, this process should continue until the user guesses the correct number. When the correct number is guessed, the program will display a message eg 'Well done, you guessed the correct number in x attempts'.
[Alternatively – if you are already proficient at programming, able to use arrays and more complex algorithms, you can attempt to create a simple game of tic tac toe (noughts and crosses).]
- 3) The user interface doesn't need to be complex, a very simple command line interface is adequate.
- 4) Ideally you should write your program using sub-procedures and functions
- 5) You should include a basic design for the system (ie flowcharts or pseudo code).
- 6) Your code should be annotated (ie it should include comments!)
- 7) You should include some evidence of testing the program, using a test table and some screenshots or examples of output.
- 8) Once you have developed the program, paste the code into a word or pdf document together with screenshot evidence of development, testing and the final program running.