Preparation for Year 12

Computer Science ▾

Congratulations on your GCSE successes and welcome to your post-16 studies at All Saints!

At this significant moment in your education, you have selected to study courses that reflect your own unique gifts, talents, interests and future goals.

So let's get started! These tasks are designed to introduce you to some concepts that you will be exploring over the year ahead as well as giving you the opportunity to demonstrate your commitment and sincere interest in this subject.

We look forward to seeing your preparation work and welcoming you to our department in September.

Deadline for submission	**Tuesday 2nd September 2025**	
Where to submit work	Internal students:	External students: email
	Google Classroom ▾	*dtaune@allsaintsschool.co.uk*

Choose **TWO** tasks to complete from the following list:

Week	Task / question	Links to help you	Notes
1	**Research** the linear and binary search algorithms using the resources given	http://pythonschool.net/data-structures-algorithms/binary-search/ http://pythonschool.net/data-structures-algorithms/linear-search/	

2	**Create** a Python program to implement a linear search on a data set of numbers (1 to 20) and print-screen it. Write the Pseudocode for a binary search from a list of names in the data set. (list of strings)	http://pythonschool.net/data-structures-algorithms/binary-search/	
3	**Reflect** Compare and contrast both algorithms in a report, discussing their efficiency and limitations and taking into consideration their best and worst cases.		
4	**Watch** the videos from Crush Course Computer Science	https://www.youtube.com/playlist?list=PL8dPuuaLjXtNlUrzyH5r6jN9ulIgZBpdo	

Keywords and definitions:

You will need to be familiar with the following keywords in term 1.

Keyword	Definition & Use of keyword within contex
Algorithm	A sequential set of instructions designed to solve a task/problem in a finite number of steps. **The sorting algorithms required for A level are: bubble, insertion, merge quick and selection sort**
Variable/Constant	Identifiers (names) given to memory locations whose contents will change/stay the same during the execution of the program.

	Variables could store primitive data types such as integers/strings or complex data structures (queues, arrays, etc.)
Selection	Making a decision in a program depending on a condition evaluating to True or False.
Black box testing	Functional testing, independent of the code, testing all the inputs, outputs and program functions.
White box testing	Testing involves studying the code and testing every possible path through the program at least once.
Pipelining	The technique used by CPUs to improve performance, where while one instruction is being fetched, one is being decoded and another might be executed.
Harvard Architecture	Computer architecture with physically separate memories for instructions and data. Harvard architecture is mainly used for embedded systems, digital, audio and image processing systems
Von Neumann Architecture	Computer architecture where data and instructions are stored in the memory in the same place. The registers from Von Neumann architecture could be specialised performing specific tasks (IR, ACC, etc) or be of general purpose.
Alpha/Beta testing	Alpha testing is carried out by the in-house testing team, while the beta testing is carried out by the actual users. Alpha testing could reveal errors in system requirements while beta testing could reveal errors not anticipated by the developers.

System Software	Type of computer program that is designed to run a computer's hardware and application programs. "You can mass-produce hardware; you cannot mass-produce software"; Michio Kaku
Utility Software	Designed to support the computer infrastructure by helping to analyse, configure, optimise or maintain a computer. "People who are really serious about software should make their own hardware." Alan Kay