# A Level Computer Science

**Transition Task** 

2024

#### Algorithms: from theory to practice

A core concept of computer science is that of data structures and algorithms.

It is also an area which many students struggle with during examinations.

Probably the most basic algorithm is that of the "linear search".

If you have done the GCSE course you will have learnt about this searching algorithm already.

Start by learning or refreshing your knowledge of the linear search algorithm by using the videos on this page:

<u>https://www.craigndave.org/algorithms-linear-search</u>

Once you are happy with the theory complete the exercises on the following slides.

#### Expected time to complete: 4 hours



#### Algorithms: from theory to practice

1. Describe what the linear search algorithm does.

 $\ \ 2. \ \ What are the applications of the linear search algorithm?$ 

3. Write out the steps of the linear search algorithm in simple-structured English.

4. Draw a simple diagram which illustrates the linear search algorithm.

Expected time to complete: 2 hours

### Algorithms: from theory to practice

#### Expected time to complete: 2 hours

- 5. Write out pseudocode for the linear search algorithm.
- The algorithm should use an array called items which is pre-populated with the following values: "Florida", "Georgia", "Delaware", "Alabama", "California"
- The algorithm should ask the user to "Enter the state to find:"
- If the algorithm locates the state entered by the user in the array it should report back to the screen "Item found at position n"
- If the algorithms can not locate the state entered by the user in the array it should report back to the screen "Item not found"

#### Algorithms: from theory to practice

#### Expected time to complete: 2 hours

- 6. Have a go at coding the linear searching algorithm in a programming language of your choice.
- The program should work use an array called items which is pre-populated with the following values: "Florida", "Georgia", "Delaware", "Alabama", "California"
- The program should ask the user to "Enter the state to find:"
- If the program locates the state entered by the user in the array it should report back to the screen "Item found at position n"
- If the program can not locate the state entered by the user in the array it should report back to the screen "Item not found"

#### Cut and paste the code you have written into the box

below: