

**www.m4ths.com D1 Sorting and Searching Algorithms.**

**Task 1** - Use the Bubble Sort to sort each list below in ascending order. YOU must do a comparison by comparison for the first pass only.

(a) 7 3 1 5 4 7 2 8 9

(b) 1.7, 2.4, 3.8, 1.1, 0.8, 2.3, 1.9, 3.1

**Task 2** - Use the Quick Sort to sort each list below in ascending order.

(a) 8 9 1 3 5 4 2 7 3 4

(b) -1 2 -5 7 3 -4 9 -2

**Task 3** – Use a sorting Algorithm to sort the letters below in alphabetical order:

B H E J G Z D T R A

**Task 4** – Use the binary search to locate the name (a) Kevin

(b) Dave (c) Quentin in the list below

Ahmed  
Barry  
Dave  
James  
Jonathon  
Kevin  
Mike  
Nazim  
Unicorn  
Zang

**Task 5** – The eight ‘best bands’ in the world are listed below.

(a) Explain why you can’t use the binary search on the list below in its current form.

Wham  
ACDC  
The Bangles  
The Rolling Stones  
Little Mix  
Nickelback  
Green Day  
Papa Roach

(b) Use a sort to put the bands in alphabetical order

(c) Use the binary search to locate: (i) The Bangles (ii) Wham (iii) One Direction.

**Task 6** – 8 of the best mathematicians of all time are listed below:

Newton  
Euler  
Euclid  
Blades  
Pythagoras  
Fermat  
Gauss  
Leibniz

(a) Use a quick sort to put the list in alphabetical order

(b) Use the binary search to locate Blades

(c) Use the binary search to locate Einstein

**Task 7** – There are  $t$  items in a list of numbers. Given that  $t$  is a single digit integer, find:

(a) The maximum and minimum number of passes required to sort the  $t$  items using a bubble sort.

(b) The max/min number of iterations to locate any given value using a binary search.

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