

Questions

1) A programmer wants to use a search algorithm for this array

[3, 8, 9, 15, 12, 8].

a) Explain how a linear search would search for the target value 12. [4]

b) State why a binary search could not be used for this array. [1]

2) A binary search is usually more efficient than a linear search.

a) Explain why a linear search would complete quicker for this array [1, 5, 8, 10, 25, 26, 27, 30, 45, 60, 62, 63] when searching for the target value 5. [2]

b) Explain why the speed of the binary and linear search algorithms are not an important factor when choosing an algorithm for this array. [2]

c) State which target value would be the best case scenario (fastest search time) for using a binary search on this array. [1]

d) A binary search algorithm is used with the array ['a', 'c', 'e', 'f', 'h', 'j', 'm', 's', 't'] to find the target value 'j'.

Complete the table to show the characters in the order that the algorithm would compare them against the target value. You may or may not need to use all the rows. [3]

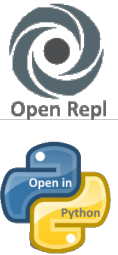
Middle Value

[TURN OVER]

3) Examine the OCR ERL for a binary search algorithm below. The line numbers are not part of the algorithm.

```

1  function BinarySearch(searchList, searchItem)
2      start = 0
3      end = len(searchList) - 1
4      while start <<i>> end
5          midPoint = (start + end) DIV 2
6          if searchList[midPoint] > searchItem then
7              <<iii>>
8          elseif searchList[midPoint] < searchItem then
9              start = midPoint + 1
10         <<ii>>
11         return true
12     endif
13 endwhile
14     return false
15 endfunction
    
```



a) i) Identify the code which should go in place of <<i>>.

- A ==
- B <
- C <=
- D !=
- E >=

[1]

ii) Write the code which should go in place of <<ii>>.

[1]

ii) Write the code which should go in place of <<iii>>.

[1]

b) State the purpose of line 14.

[1]