

Algorithms Assessment

Name:

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| Total | / 25 |
| Grade |  |
| Comments |  |

1. Demonstrate the stages of a Merge Sort using the diagram below

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 3 | 6 | 8 | 1 | 7 | 2 | 9 | 4 |

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(4 marks)

1. Describe the process a merge sort and what happens at each step.

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1. Use a Bubble Sort to put the following data in Alphabetical Order. Show the order of the data after each pass.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Blue | Red | Green | Purple | Gold | Black | White | Yellow | Pink |

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1. Give 1 advantage to using the Bubble Sort Algorithm to sort data.

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1. Use an Insertion Sort to organize the data below into alphabetical order.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pasty | Carrot | Egg | Mushroom | Pizza | Kipper | Fish finger |

1. What is the 5th item of data to be sorted into the list?

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1. What does the sorted list look like after 3 pieces of data have been sorted?

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1. What are the correct steps of the following data set when it is being sorted with the Insertion Sort? 20, 15, 10, 18
2. 15, 20, 10, 18 --- 10, 15, 20, 18 --- 10, 15, 18, 20 --- 10, 15, 18, 20
3. 15, 18, 10, 20 --- 10, 18, 15, 20 --- 10, 15, 18, 20 --- 10, 15, 18, 20
4. 15, 10, 20, 18 --- 15, 10, 18, 20 --- 10, 15, 18, 20

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1. Conduct a binary search on this set of data and answer the following questions:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Black | Blue | Gold | Green | Pink | Purple | Red | White | Yellow |

1. How many items are checked to find the item ‘Yellow?’

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(1 mark)

1. Which items are checked when looking for the item ‘Black’?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(1 mark)

1. Conduct a Linear Search on this set of data and answer the following questions:

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Blue | Red | Green | Purple | Gold | Black | Pink | Yellow | White |

1. Which items are checked when finding the item ‘Yellow?’

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(1 mark)

1. How many items are checked to find the item ‘Green’?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(1 mark)

1. Which searching algorithm, Binary or Linear, would be most suitable for finding an item of data in a large data set? Explain your answer.

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1. Under what circumstances would it be NOT possible to carry out a Binary Search on a set of data?

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1. Describe briefly one scenario where records are stored in a Computer Database and frequently need to be searched. State the scenario, and the reasons why this data may need to be searched.

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