**Tutorial 03**

**Search**

1. Given the following unsorted list of numbers:
   * [ 12, 19, 3, 13, 20, 5, 8, 16, 6, 15 ]

Using sequential search, how many comparisons would you need to perform in order to find the search key 8?

**Solution:**

7 comparisons. Item is found.

1. Given the following sorted list of numbers:
   * [ 3, 6, 8, 10, 11, 15, 17, 18, 19, 20 ]

Using sequential search, how many comparisons would you need to perform in order to find the search key 12?

**Solution:**

* Using sequential search, 10 comparisons. Item is not found.
* Using sequential search (that is improved for searching sorted list), 6 comparisons (fewer comparisons needed). Item is not found.

1. Given the following list of numbers and their corresponding index position:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Index Position** | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| **List**  **Elements** | 10 | 23 | 25 | 34 | 36 | 42 | 63 | 74 | 87 | 92 | 99 |

Use the table below to perform a binary search on the value 63:

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Data Structures & Algorithms



**Solution**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pass** | **Low Pointer Index Position** | **Middle Pointer Index Position** | **High Pointer Index Position** | **Found (Yes/No)** |
| 1 | 0 | 5 | 10 | No |
| 2 | 6 | 8 | 10 | No |
| 3 | 6 | 6 | 7 | Yes |

1. Given the following list of numbers and their corresponding index position:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Index Position** | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| **List**  **Elements** | 10 | 23 | 25 | 34 | 36 | 42 | 63 | 74 | 87 | 92 | 99 |

Use the table below to perform a binary search on the value 18:

**Solution**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pass** | **Low Pointer Index Position** | **Middle Pointer Index Position** | **High Pointer Index Position** | **Found (Yes/No)** |
| 1 | 0 | 5 | 10 | No |
| 2 | 0 | 2 | 4 | No |
| 3 | 0 | 0 | 1 | No |
| 4 | 1 | 1 | 1 | No |
| 5 | 1 | - | 0 | **Low Pointer >**  **High Pointer >**  **Value 18 is not in the list** |

***-- End of Tutorial --***

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