# Linear Search By Hand

In the pre-class activities, you will code up linear search, binary search, and BubbleSort routines –in order to get you 'warmed up' for today, we're going to start by having you do these searches/sorts *by hand*, which should help solidify the algorithm in your head. In order to do that, you will be provided with a picture of an array, and some boxes representing variables – your job is to fill in the pictures & boxes, so that you can show, STEP BY STEP, how each algorithm works.

It is highly recommended that you print out these pictures, and do this by hand.

Note that you may, or may not, actually need to use all of the spaces provided to you.

Starting with the array pictured below, fill out the variables below it, step by step, in order to show how a linear search operates. The first couple of steps are filled in, as a demonstration

Given the method (defined with the SearchingAndSorting class)

**bool FindIntegerLinear(int targetValue, int[] arrayToSearch)**

This method will be called from main, in the following manner:

int [] nums = { 17, 12, 21, -3, 0};

SearchingAndSorting sas = new SearchingAndSorting();

if( sas.FindIntegerLinear(-3, nums) )

Console.WriteLine("Found it!");

You will start your 'trace' as follows:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Array Index: | 0 | 1 | 2 | 3 | 4 |
| Value: | 17 | 12 | 21 | -3 | 0 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | Iteration 0 | | | Target Value: | -3 | | Index to Search: | 0 | | Value Found?  (17 != -3) | False | | |  |  | | --- | --- | | Iteration 1 | | | Target Value: | -3 | | Index to Search: | 1 | | Value Found?  (12 != -3) | False | |
| |  |  | | --- | --- | | Iteration 2 | | | Target Value: | -3 | | Index to Search: | 2 | | Value Found?  ( 21 != -3 ) | False | | |  |  | | --- | --- | | Iteration 3 | | | Target Value: | -3 | | Index to Search: | 3 | | Value Found?  ( -3 == -3 ) | True | |
| |  |  | | --- | --- | | Iteration 4 | | | Target Value: |  | | Index to Search: |  | | Value Found?  ( ) |  | | |  |  | | --- | --- | | Iteration 5 | | | Target Value: |  | | Index to Search: |  | | Value Found?  ( ) |  | |
| |  |  | | --- | --- | | Iteration 6 | | | Target Value: |  | | Index to Search: |  | | Value Found?  ( ) |  | | |  |  | | --- | --- | | Iteration 7 | | | Target Value: |  | | Index to Search: |  | | Value Found?  ( ) |  | |