

Linear Search

Linear search algorithm starts at index 0 in an array and searches for an item in the array. It is an extremely popular algorithm in the programming world and it has some adaptations.

Task 1

Click the **code file 1** button and copy/paste the code into your ide.

Run the code.

Can you see how it works? Test it by using the following test table:

Input data	Expected Output	Actual Output
Choose a value listed		
-100		

Task 2

Click the **code file 2** button and copy/paste the code into your ide.

Run the code.

Complete the test table:

Input data	Expected Output	Actual Output
Choose a value listed		
-100		

This time there will be **an error** if the search item is not in the array.

Write down (or copy paste) the name of the error here:

The loop control variable, **i**, is incrementing while it hasn't found the search item.

If the search item is not in the array, **i** keeps incrementing anyway! So, eventually **i** will no longer be an index in the array, `numArray` and `numArray[i]` will not be valid anymore.

Solution

To stop this from happening, add some addition logic to the while loop:

```
while i<len(numArray) and numArray[i] != searchItem:
```

Does this fix the problem? Complete the test table:

Input data	Expected Output	Actual Output
Choose a value listed		
-100		

Task 3

Discuss what you have found out in these activities with your partner(s). What questions do you have about the code you have been working with?

Task 4

Design a function whose purpose is to search an array **of any length** for a value and return the index of that value, or -1 if the value is not found. Test your solution with the following program:

```
def getIndex(dataSet, searchItem):
    #your code

def main():
    aListOfNumbers = [2,5,3,3,5,7,7,54,3,32,4,56,76]
    anItemToSearchFor = int(input("Enter a number: "))

    #call the function and grab the returned index
    index = getIndex(aListOfNumbers, anItemToSearchFor)

    if index == -1:
        print(f"{anItemToSearchFor} not found!")
    else:
        print(f"{anItemToSearchFor} found at index {index}")

#call main
main()
```

Test your solution by messing around with the length of aListOfNumbers eg add more values or remove some. Your program should still work.

Submit your .py file as instructed.