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Campus

Course: Python Projects - 2

Project On: Binary search algorithm

Problem Statement

Have you ever heard the proverb, “finding a needle in a haystack.” This program is designed to do just that- by using a binary search algorithm.

This python project idea will help you create and implement an algorithm that searches for an element in a list.

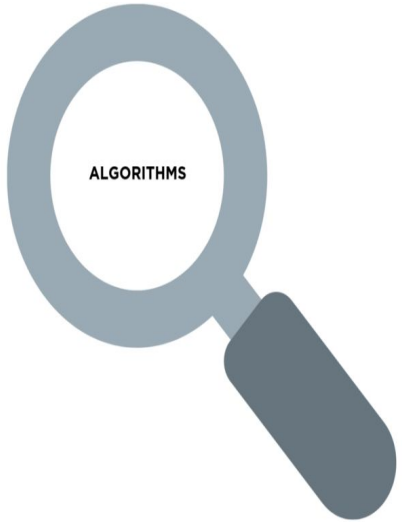
In a nutshell, this search algorithm takes advantage of a collection of elements that is already sorted by ignoring half of the elements after just one comparison.

Description

- You have to create a list of random numbers between 0 to 100, with every succeeding number having a difference of 2 between them.
- When the user inputs a random number, the program will check if that number is included in the list. It will do so by creating two halves of the list.
- If the program finds the number in the first half of the list, it will eliminate the other half and vice versa.
- The search will continue until the program finds the number input of the user or until the subarray size becomes 0 (this means that the number is not in the list).

TASKS

- Take a number x between 0 to 100 as an input from user.
- Compare x with the middle element.
- If x matches with the middle element, we return the mid index.
- Else if x is greater than the mid element, then x can only lie in the right (greater) half subarray after the mid element. Then we apply the algorithm again for the right half.
- Else if x is smaller, the target x must lie in the left (lower) half. So we apply the algorithm for the left half.



Test Case

Test Case:

Input:

```
Enter the Element
which you want to
search: 3
```

Output:

```
Element is found at index 1
```

Input:

```
Enter Element to
Search: 2
```

Output:

```
Elements Found at index:  2
```

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All The Best!