**Searching**

**Linear Search**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 10 | 15 | 45 | 20 | 25 | 6 | 1 | 100 | 65 | 99 | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |  |  |  |  |  |  | | --- | --- | --- | --- | --- | | item | 25 |  | position | -1 |   **Input (***Declarations and Initializations***):** int arr[10], int item, int position = -1.  **Process:**   1. Compare the value of ***item*** with the ***element*** in the ***index-value*** 0 of the array. 2. If, they are equal, the value of ***position*** will be the value of the ***index*** and exit. Else, go to next index. 3. Repeat (1) and (2) for all the indexes.   **Output:**   1. Check the value of position.   If, it is -1, Print ***item*** not found in the array.  Else, Print ***item***foundat ***position***. |

**Binary Search**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 1 | 6 | 10 | 15 | 20 | 25 | 45 | 65 | 99 | 100 | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |  |  |  |  |  |  | | --- | --- | --- | --- | --- | | item | 25 |  | position | -1 |   **Input (***Declarations and Initializations***):** int arr[10], int item, int position = -1.  **Process:**   1. Start with ***f\_index = 0*** and ***l\_index = size-1*** 2. The value of ***m\_index*** will be ***(f\_index+l\_index)/2***. 3. Compare the value of ***item*** with ***arr[m\_index]***. 4. If item < arr[m\_index], ***l\_index*** will be ***m\_index-1***. 5. Else if item > arr[m\_index], ***f\_index*** will be ***m\_index+1***. 6. Else, ***position*** will be ***m\_index***. Exit. 7. Repeat (2), (3) till ***f\_index<= l\_index***.   **Output:**   1. Check the value of position.   If, it is -1, Print ***item*** not found in the array.  Else, Print ***item***foundat ***position***. |