Linear Search:

Linear Search is defined as a sequential search algorithm that starts at one end and goes through each element of a list until the desired element is found, otherwise the search continues till the end of the data set.

Algorithm:

1. Every element is considered as a potential match for the key and checked for the same.
2. If any element is found equal to the key, the search is successful and the index of that element is returned.
3. If no element is found equal to the key, the search yields “No match found”.

Code:

```
// C++ code to linearly search x in arr[].

#include <bits/stdc++.h>
using namespace std;

int search(int arr[], int N, int x)
{
	for (int i = 0; i < N; i++)
		if (arr[i] == x)
			return i;
	return -1;
}

// Driver code
int main(void)
{
	int arr[] = { 2, 3, 4, 10, 40 };
	int x = 10;
	int N = sizeof(arr) / sizeof(arr[0]);

	// Function call
	int result = search(arr, N, x);
	(result == -1)
		? cout << "Element is not present in array"
```

```
                : cout << "Element is present at index " << result;
        return 0;
}
```

Output:

```
PS D:\Mirro>  & 'c:\Users\shash\.vscode\ext
er.exe' '--stdin=Microsoft-MIEngine-In-qj3h
ngine-Error-f3hr4vlb.tsk' '--pid=Microsoft-
db.exe' '--interpreter=mi'
Element is present at index 3
PS D:\Mirror\ICT\3rd YEAR\SEM 5\Design and
```

Space complexity: _____

Justification:_____
_____

Time complexity:

Best case time complexity: _____

Justification:_____
_____

Worst case time complexity: _____

Justification:_____