**Lab 7 : Searching**

1. Write a program to search for a data using binary search algorithm. Number of elements keyed in into the system will be determined by the user. Create a function named *search( )* to perform the binary search algorithm. Use the following function prototype.

int search(int a[],int size,int y);

There will be three arguments passed to the *search( )* function : an array, array size, searched element. This function will return the position of the searched element, if the element is found.

**Sample output:**

|  |
| --- |
| Enter array size: 4  Enter element 1:10  Enter element 2:30  Enter element 3:60  Enter element 4:70  Enter element to search: 60  Element found at index 2 |

1. By using binary search, show step by step how to find data 65 in the array given. You may use diagram to depict the process.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Array** | 90 | 85 | 80 | 70 | 65 | 56 | 40 | 20 |
| **Index** | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Submission questions**

Create a structure **student** which consists of *student ID* and *subject mark*. Allow user to key in 5 students’ record. Add a command for user to search a target (search by student ID). Prompt a command whether the target is found or not. If the target is found, display his/her ID, mark and the grade of the mark. (Refer to the screenshot given)

Please indicate clearly whether the sequential (linear) search or the binary search is being used for this exercise. The classifications of the grade are as follows:

|  |  |
| --- | --- |
| Grade | Mark |
| A | 80 – 100 |
| B | 60 – 79 |
| C | 50 – 59 |
| D | 40 – 49 |
| F | 0 – 39 |

**Sample output:**

|  |
| --- |
| Please enter students' ID and marks:  Student 1 ID: 3333  Student 1 mark: 50  Student 2 ID: 1111  Student 2 mark: 72  Student 3 ID: 5555  Student 3 mark: 65  Student 4 ID: 4444  Student 4 mark: 75  Student 5 ID: 2222  Student 5 mark: 89  Enter the student's ID that you want to search: 4444  Target found  The mark of student 4444 is 75. The grade is B |