1. **Binary Search**

**Code:**

#include <stdio.h>

// Function to perform binary search

int binarySearch(int arr[], int left, int right, int key) {

while (left <= right) {

int mid = left + (right - left) / 2;

// Check if the key is present at the middle

if (arr[mid] == key)

return mid;

// If key is greater, ignore left half

if (arr[mid] < key)

left = mid + 1;

// If key is smaller, ignore right half

else

right = mid - 1;

}

// Key not found

return -1;

}

int main() {

int n, key;

printf("Enter the size of the array: ");

scanf("%d", &n);

int arr[n];

printf("Enter the elements of the sorted array:\n");

for (int i = 0; i < n; i++) {

scanf("%d", &arr[i]);

}

printf("Enter the key to search: ");

scanf("%d", &key);

int result = binarySearch(arr, 0, n - 1, key);

if (result == -1)

printf("Element %d is not present in the array.\n", key);

else

printf("Element %d is present at index %d.\n", key, result);

return 0;

}

**Output:**

Enter the size of the array: 20

Enter the elements of the sorted array:

5 6 11 17 28 45 73 118 191 309 500 809 1309 2118 3427 5545 8927 14517 23444 37961

Enter the key to search: 2118

Element 2118 is present at index 13.

--------------------------------

Process exited after 275.9 seconds with return value 0

Press any key to continue . . .

