Assignment 2: Searching Technique

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Batch: A2

Code:

```c
#include <stdio.h>
#include <stdlib.h>

int main() {

    int n, key, temp,ch, flag = 0, found = 0;
    int mid;
    int first = 0;
    int last = n -1;
    printf("Enter size of array: ");
    scanf("%d", &n);
    int a[n];
    printf("Enter elements of array: \n");
    for(int i = 0; i < n; i++){
        scanf("%d", &a[i]);
    }
    printf("Unsorted array: \n");
    for (int i = 0; i < n; i++){
        printf("%d\t", a[i]);

    }
    printf("\n");

    // bubble sort
    for(int i = 1; i < n; i++) {
        //comp += 1;
        for (int j = 0; j < n - i; j++){
```

```
            //swap += 1;
            if( a[j] > a[j+ 1]){
                temp = a[j];
                a[j] = a[j+ 1];
                a[j+ 1] = temp;

            }

        }

    }

    printf("Sorted array: \n");
    for (int i = 0; i < n; i++){
        printf("%d\t", a[i]);

    }
    printf("\n");

    printf("Enter key which you want to search for: ");
    scanf("%d", &key);

    do {
        printf("Menu:\n");
        printf("1. Linear Search\n");
        printf("2. Binary Search\n");
        printf("3. Exit\n");
        printf("Enter corresponding number for searching type or exit: ");
        scanf("%d", &ch);

        switch(ch) {

            case 1:

                // Linear search

                for(int i = 0; i < n; i++) {
                    if(a[i] == key) {
                        flag = 1;
                        break;
```

```
                }


            }
            if(flag == 1) {
                printf("%d is found in given array.\n", key);
            }
            else {
                printf("%d is not found,\n", key);
            }
            break;

        case 2:
            // Binary search

            while (first < last) {
                mid = (first + last) / 2;
                if(key > a[mid]){
                    first = mid + 1;
                }
                else if(key < a[mid]) {
                    last = mid -1;
                }
                else {
                    found = 1;
                    printf("%d is present at %d \n",key, first);
                    break;
                    }




            }
            if (last < first) {
                printf("%d is not found.\n",key);
                }


            break;
```

```
                case 3:
                    exit(0);

                default:
                    printf("Invalid choice.");
        }               break;
        break;
    } while(ch < 4);









    return 0;
}
```

Output:

```
d:\OneDrive\Dokumen\Clg_work\Assignments>cd
"d:\OneDrive\Dokumen\Clg_work\Assignments\" && gcc 2search.c -o 2search &&
"d:\OneDrive\Dokumen\Clg_work\Assignments\"2search
Enter size of array: 5
Enter elements of array:
3 2 1 4 5
Unsorted array:
3       2       1       4       5
Sorted array:
1       2       3       4       5
Enter key which you want to search for: 3
Menu:
1. Linear Search
2. Binary Search
3. Exit
Enter corresponding number for searching type or exit: 2
3 is found at 2
```