

SOURCE CODE:

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#include <stdio.h>

void binary(int a[], int lo, int hi, int key)
{
    int mid;
    clrscr();

    if (lo > hi)
    {
        printf("\n\n\n\tElement %d NOT found!\n",key);
        return;
    }
    mid = (lo + hi) / 2;
    if (a[mid] == key)
    {
        printf("\n\n\n\tElement %d FOUND!!! at position %d\n",key,mid+1);
    }
    else if (a[mid] > key)
    {
        binary(a, lo, mid - 1, key);
    }
    else if (a[mid] < key)
    {
        binary(a, mid + 1, hi, key);
    }
}

void sort(int a[], int size)
{
    int temp, i, j;

    printf("\n\tEnter the elements:\n");
    for(i = 0; i < size; i++)
    {
        printf("\t\t");
        scanf("%d", &a[i]);
        printf("\n");
    }

    for (i = 0; i < size; i++)
    {
        for (j = i; j < size; j++)
        {
            if (a[i] > a[j])
            {
                temp = a[i];
                a[i] = a[j];
                a[j] = temp;
            }
        }
    }
}
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        clrscr();
        printf("\n\tSorted array is as follows :\n\n");
        for (j = 0; j < size; j++)
        {
            printf("\t\t%d",a[j]);
            printf("\n");
        }
    }

void main()
{
    int op, ch, key, size, i;
    int a[25];

    loop2:
    clrscr();
    printf("\tEnter size of the array: ");
    scanf("%d", &size);

    printf("\n\tChoose the type of list you wish to enter: ");
    printf("\n\n\t 1. Sorted (Ascending to descending integers)");
    printf("\n\n\t 2. Unsorted (Random integers)");
    printf("\n\n\n\tEnter your choice (1 or 2): ");

    scanf("%d",&op);
    switch (op)
    {
        case 1:
            printf("\n\tEnter the elements: \n");
            for(i = 0; i < size; i++)
            {
                printf("\t\t");
                scanf("%d", &a[i]);
                printf("\n");
            }
            clrscr();
            break;

        case 2:
            sort(a, size);
            break;
    }

    loop1:
    printf("\n\n");
    printf("\n\tEnter element to be searched: ");
    scanf("%d", &key);
    binary(a, 0, size, key);

    printf("\n\n\n\tWould you like to try again? ");
    printf("\n\t 1. Yes with same list.");
    printf("\n\t 2. Yes with a new list.");
    printf("\n\t 3. No.");
    printf("\n\n\tEnter your choice (1,2 or 3): ");
    scanf("%d",&ch);

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switch(ch)
{
    case 1:
        goto loop1;

    case 2:
        goto loop2;

    case 3:
        printf("\n\n\t Exiting... Press Enter again!");
        break;
}

    getch();
}

```

OUTPUT:

```

root@ct05:~/Desktop# gcc BINARY.C -o binary
root@ct05:~/Desktop# ./binary
Enter size of the array: 5
Choose the type of list you wish to enter:
    1. Sorted (Ascending to descending integers)
    2. Unsorted (Random integers)

Enter your choice (1 or 2): 1
Enter the elements:
    1
    2
    3
    4
    5

```

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Enter element to be searched: 3

Element 3 FOUND!!! at position 3

Would you like to try again?
    1. Yes with same list.
    2. Yes with a new list.
    3. No.

Enter your choice (1,2 or 3): 3

Exiting... Press Enter again!root@ct05:~/Desktop#

```