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Roll No. 65

Experiment No. 09

Program:

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

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

```
void insertionSort(int arr[], int n);
```

```
void main()
```

```
{
```

```
    int arr[100], i, n, x, choice, flag = 0;
```

```
    printf("\t --- WELCOME TO IMPLEMENTATION OF BINARY SEARCH --- \n");
```

```
    printf("\n Enter the number of elements of the array [maximum size = 100] : ");
```

```
    scanf("%d", &n);
```

```
    printf("\n Enter %d elements of the array : \n", n);
```

```
    for (i = 0; i < n; i++)
```

```
    {
```

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

```
    }
```

```
    insertionSort(arr, n);
```

```
    do
```

```
    {
```

```
        printf("\n\n !! -- Operations available -- !!");
```

```
        printf("\n 1. Display Sorted List \t 2. Search a particular value \t 3. Exit");
```

```
        printf("\n Please Enter your choice : ");
```

```
        scanf("%d", &choice);
```

```
        switch (choice)
```

```
        {
```

```
            case 1:
```

```
            {
```

```
                printf("\n\n The sorted array is : \n");
```

```
                for (i = 0; i < n; i++)
```

```
                {
```

```
                    printf(" %d \t", arr[i]);
```

```
                }
```

```

break;
}
case 2:
{
printf("\n Enter the number to be searched : ");
scanf("%d", &x);
int beg = 0, end = n - 1, mid;
while (beg <= end)
{
    mid = (beg + end) / 2;
    if (arr[mid] == x)
    {
        printf("\n %d is present in the sorted array at index : %d", x, mid);
        flag = 1;
        break;
    }
    else if (arr[mid] > x)
    {
        end = mid - 1;
    }
    else
    {
        beg = mid + 1;
    }
}
if (beg > end || flag == 0)
{
    printf("\n %d does not exist in the array", x);
}
break;
}
case 3:
{
printf("\n Program Finished !! Thank You");
break;
}
default:

```

```

    {
    printf("\n Please enter a valid choice 1, 2, 3.");
    }
    }
    } while (choice != 3);
}

```

```

void insertionSort(int arr[], int n)
{
    int i, j, temp;
    for (i = 1; i < n; i++)
    {
        temp = arr[i];
        j = i - 1;
        while ((temp < arr[j]) && (j >= 0))
        {
            arr[j + 1] = arr[j];
            j--;
        }
    }
}

```

```

Oct 9 14:41
dl404@ltadmin: ~
dl404@ltadmin:~$ gedit exp9.c
dl404@ltadmin:~$ gcc exp9.c
exp9.c: In function 'main':
exp9.c:76:5: error: too few arguments to function 'getc'
   76 |     getc();
       |     ^~~~~
In file included from exp9.c:1:
/usr/include/stdio.h:486:12: note: declared here
   486 | extern int getc (FILE *__stream);
       |
dl404@ltadmin:~$ gedit exp9.c
dl404@ltadmin:~$ gcc exp9.c
dl404@ltadmin:~$ ./a.out
--- WELCOME TO IMPLEMENTATION OF BINARY SEARCH ---

Enter the number of elements of the array [maximum size = 100] : 4

Enter 4 elements of the array :
1
5
3
7

!! -- Operations available -- !!
1. Display Sorted List      2. Search a particular value  3. Exit
Please Enter your choice : 1

The sorted array is :
1      3      5      7

!! -- Operations available -- !!
1. Display Sorted List      2. Search a particular value  3. Exit
Please Enter your choice : 2

Enter the number to be searched : 7

7 is present in the sorted array at index : 3

!! -- Operations available -- !!
1. Display Sorted List      2. Search a particular value  3. Exit
Please Enter your choice : 3

Program Finished !! Thank You dl404@ltadmin:~$

```