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SY-IT
Roll No:32

Code:

```
#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 int 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--;
}
arr[j + 1] = temp;
}
}
```

Output:

```
l0411@itadmin:~$ gcc raj9.c
l0411@itadmin:~$ ./a.out
        --- WELCOME TO IMPLEMENTATION OF BINARY SEARCH ---

Enter the number of elements of the array [maximum size = 100] : 7

Enter 7 elements of the array :
2
34
56
6
8
55
36


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


The sorted array is :
12      58      76      334     436     556     955

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

Enter the number to be searched : 12

12 is present in the sorted array at index : 0

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