**EXPERIMENT 9**

Name - Samiksha Terwankar

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 -

