**Program – 8**

**AIM – Write an algorithm and program to implement interpolation search.**

**Algorithm:**

Step 1 − Start searching data from middle of the list.

Step 2 − If it is a match, return the index of the item, and exit.

Step 3 − If it is not a match, probe position.

Step 4 − Divide the list using probing formula and find the new midle.

Step 5 − If data is greater than middle, search in higher sub-list.

Step 6 − If data is smaller than middle, search in lower sub-list.

Step 7 − Repeat until match.

**Source Code:-**

#include <stdio.h>

#define MAX 200

int interpolation\_search(int a[], int bottom, int top, int item)

{

int mid;

while (bottom <= top) {

mid = bottom + (top - bottom)\*((item-a[bottom])/(a[top]-a[bottom]));

if (item == a[mid])

return mid + 1;

if (item < a[mid])

top = mid - 1;

else

bottom = mid + 1;

}

return -1;

}

int main()

{

int arr[MAX];

int i, num;

int item, pos;

printf("\nEnter total elements (num < %d) :", MAX);

scanf("%d", &num);

printf("Enter %d Elements in ascending order:\n",num);

for (i = 0; i < num; i++)

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

printf("\nSearch For : ");

scanf("%d", &item);

pos = interpolation\_search(&arr[0], 0, num - 1, item);

if (pos == -1)

printf("\nElement %d not found\n", item);

else

printf("\nElement %d found at position %d\n", item, pos);

return 0;

}