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Sec : A

Assignment 1.1:

#include <stdio.h>

int a[]={-100,-89,-56, -5,0,6,10,75, 99};

int Linear\_Search(int x){

int count=0;

for(int i=0;i<9;i++){

count++;

if(a[i]==x){

break;

}

}

return count;

}

int Binary\_Search(int x){

int start=0;

int end=8;

int mid;

int count=0;

while(start<=end){

mid=(start+end)/2;

if(a[mid]==x){

count++;

break;

}

else if(x<a[mid]){

count++;

end=mid-1;

}

else if(x>a[mid]){

count++;

start=mid+1;

}

}

return count;

}

int main(){

int c1,c2;

c1=Linear\_Search(-100);

c2=Binary\_Search(-100);

printf("-100 %d %d\n",c1,c2);

if(c1<c2){

printf("Linear Search is better\n");

}

else{

printf("Binary Search is better\n");

}

c1=Linear\_Search(0);

c2=Binary\_Search(0);

printf("0 %d %d\n",c1,c2);

if(c1<c2){

printf("Linear Search is better\n");

}

else{

printf("Binary Search is better\n");

}

c1=Linear\_Search(99);

c2=Binary\_Search(99);

printf("99 %d %d\n",c1,c2);

if(c1<c2){

printf("Linear Search is better\n");

}

else{

printf("Binary Search is better\n");

}

c1=Linear\_Search(7);

c2=Binary\_Search(7);

printf("7 %d %d\n",c1,c2);

if(c1<c2){

printf("Linear Search is better\n");

}

else{

printf("Binary Search is better\n");

}

return 0;

 }

Assignment 1.3:

#include<stdio.h>

int arr[] = {24,45,67,46,12,75,85,42,98};

void merge(int arr[], int p, int q, int high) {

int arr1 = q - p + 1;

int arr2 = high - q;

int L[arr1], M[arr2];

for (int i = 0; i < arr1; i++)

L[i] = arr[p + i];

for (int j = 0; j < arr2; j++)

M[j] = arr[q + 1 + j];

int i, j, k;

i = 0;

j = 0;

k = p;

while (i < arr1 && j < arr2) {

if (L[i] <= M[j]) {

arr[k] = L[i];

i++;

} else {

arr[k] = M[j];

j++;

}

k++;

}

while (i < arr1) {

arr[k] = L[i];

i++;

k++;

}

while (j < arr2) {

arr[k] = M[j];

j++;

k++;

}

}

void merge\_sort(int arr[], int low, int high) {

if (low < high) {

int mid = low + (high - low) / 2;

merge\_sort(arr, low, mid);

merge\_sort(arr, mid + 1, high);

merge(arr, low, mid, high);

}

}

int main() {

printf("Given array: ");

for (int i = 0; i < 9; i++)

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

printf("\n");

merge\_sort(arr, 0, 8);

printf("Sorted array is: ");

for (int i = 0; i < 9; i++)

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

printf("\n");

}

