

l DSA LAB REPORT Section-F11-SLOT2

EXERCISE NO:	9	DATE OF EXERCISE:	16.11.2021
ROLL NUMBER:	20051700	GROUP NO.:	2
NAME IN CAPITAL:	Priya Pandey		

Lab Assignment (LA):

Q1. WAP to sort an array of n integers in an ascending order using Heap sort.

	Date: / / Page
	OI-THAMMYDIZZA AZU O
E.L.	
17	Hickorde tetaio.4x
'	Yold major
	Yold migial)
	int heap [10], we it I come to temps
	print ("In Enter no of elements.")
	Zan (.i. a ' 8 no).
	price! ("lu Cu ter the nambou!"/
	for (1=0; 17 no ; 1+4)
	Scarf (1.0 , Sheap Ci)
	print ("12 to to the number "), for (1=0; 12 no ; 1++) Scan ("1.0"; 8heap (2)). for (1=1; 12 no; 1++))
	C= 1/
	400 + -((-1)/2;
	If heap [mood < heap [ca]);
	heap [wood] = heap (2),
	houp [c] = Jeung;
	-
	C= 4001/
	1 while (c1=0);
	3
	printy ("la Heap avolay: "/
	for(1:=0) (λω) (1+f)
	pura (1.0 11 , maple);
	10x(1= 40-1, 1=0, 1=0)
	for(i=0 ; iλω; if+) priory ('/d Ir", heaptil); for(j= uo -1 ; j>=0; j-)/ resup = heap [0]; heap [0] = heap (j],
	map (6) = map (5)
	hop (() = temp;
	da I
	do [= 2*900+ +1;
	1 (11,00 Ca) 1 1 - 2 Ca; 7) 10 01 1
- 1	y ((map (e) (map (c+1)) (c++)

```
Date: / /
if ( heap [root] theap [c] 22 ctg)
    present ("It . I.d", heaplist ! [ [] goods ( b.1.) ) most
```

SOURCECODE

#include <stdio.h>

```
void main()
{
  int heap[10], no, i, j, c, root, temp;
```

printf("\nEnter no of elements :");

```
scanf("%d", &no);
printf("\nEnter the nos : ");
for (i = 0; i < no; i++)
 scanf("%d", &heap[i]);
for (i = 1; i < no; i++)
{
  c = i;
  do
  {
    root = (c - 1) / 2;
    if (heap[root] < heap[c])</pre>
      temp = heap[root];
      heap[root] = heap[c];
      heap[c] = temp;
    }
    c = root;
  } while (c != 0);
}
printf("\nHeap array : ");
for (i = 0; i < no; i++)
  printf("%d\t ", heap[i]);
for (j = no - 1; j >= 0; j--)
{
  temp = heap[0];
  heap[0] = heap[j];
  heap[j] = temp;
  root = 0;
  do
  {
    c = 2 * root + 1;
    if ((heap[c] < heap[c + 1]) && c < j-1)
      C++;
    if (heap[root]<heap[c] && c<j)</pre>
```

```
{
    temp = heap[root];
    heap[root] = heap[c];
    heap[c] = temp;
}
    root = c;
} while (c < j);
}
printf("\nThe sorted array is : ");
for (i = 0; i < no; i++)
    printf("\t %d", heap[i]);
}</pre>
```

```
Enter no of elements :6

Enter the nos : 1 3 4 5 6 7

Heap array : 7 5 6 1 4 3

The sorted array is : 1 3 4 5 6 7

PS C:\Users\KIIT\Desktop\New folder\Git_Code\DSA ASSIGNMENTS> []
```

Q2. WAP to sort an array of n integers in an ascending order using merge sort.

	Page
	Date: / / Pago
27	#Trudade 181410.4
	nois monge (but worl), but num stat which stat was
	(Now + view) = Pivel
	let temp (30); illimination men fration
	rus is J, K, our was in the come man
	J= mid +1;
	box (i= min ; (x= urb el ux= uax; i++)
	chelme 14
	[(wor (j) <= avr [m])
	1 oldred a read of thinks
	tuo [i] - avr (i]:
	Start 1. Com our part do look 1 de mars.
	State of June
	die 1/2, " of : Hannels : 1. "] Horang
	temp [i] - wor [w];
	11 (11) (11) (11) (11) (11) (11) (11) (
	if ((taid) { 1(1-2/2) (0) milked
112/1	if (fraid) { (1- 1/2 (0 1 mu) miles
	(++1; o; 1 (o; 1) +8)
	Jung Cil = wor [k]; How
	14-1/ Carrier
	1}
	else l
	by (K=i j K4= wid j K +)/
	for (K= i j K = unid j K + 2) /
	14+1
	for (K= min) K <= max (K++)
	over [K] = +ap CK];
	3
	المن المن المن المن المن المن المن المن

SOURCECODE

```
#include<stdio.h>
void merge(int arr[],int min,int mid,int max)
{
   int tmp[30];
   int i,j,k,m;
   j=min;
   m=mid+1;
   for(i=min; j<=mid && m<=max; i++)
   {
      if(arr[j]<=arr[m])</pre>
      {
         tmp[i]=arr[j];
         j++;
      else
         tmp[i]=arr[m];
         m++;
      }
   if(j>mid)
   {
      for(k=m; k<=max; k++)
      {
         tmp[i]=arr[k];
         i++;
   }
   else
      for(k=j; k<=mid; k++)
         tmp[i]=arr[k];
         i++;
```

```
}
   }
   for(k=min; k<=max; k++)</pre>
   arr[k]=tmp[k];
}
void sortm(int arr[],int min,int max)
{
   int mid;
   if(min<max)</pre>
   {
      mid=(min+max)/2;
      sortm(arr,min,mid);
      sortm(arr,mid+1,max);
      merge(arr,min,mid,max);
   }
}
int main()
{
   int arr[30];
   int i, size;
   printf("\tMerge sort\n");
   printf("----\n");
   printf("How many numbers you want to sort?: ");
   scanf("%d",&size);
   printf("\n Enter %d elements :\n ",size);
   for(i=0; i<size; i++)
   {
      scanf("%d",&arr[i]);
   }
   sortm(arr,0,size-1);
   printf("\nSorted elements after using merge sort:\n\n");
   for(i=0; i < size; i++)
      printf(" %d ",arr[i]);
   return 0;
}
```

```
Merge sort

How many numbers you want to sort?: 7

Enter 7 elements:
5 3 4 1 7 6 8

Sorted elements after using merge sort:

1 3 4 5 6 7 8

PS C:\Users\KIIT\Desktop\New folder\Git_Code\DSA ASSIGNMENTS> []
```

Q3. WAP to sort an array of n doubles in a descending order using quick sort.

	Date: / / Page
3>	# ludude 1stdio. 4}
	Vord guick sout (dasto namber (21), out find, het (28))
	11,0100 , teap,
	if (first x124) {
	prod = faist,
	1- pact:
	Je 10d / Ludon of discount in with 1001 = 1
	WEE (12) }
	while remember (i) to = maenter (prod 2 2: xlast)
	1++ ,'
	while (counter GI Knewsber [prod)
	J-; (ixj)[
	9(12)/
	feup = moduber Gider (80x1) 2) 20
	Compos [o rot] = member (j);
	number (il = turp) () was - and
	quick sont (www or) first , j-1);
	7
	1
	fut waru ()f
	partitle ("SOM feet little in less continued only 1 Harris
	double numbor(2[]; ilw=x1:0=ilk
	Dusat (Euter some ekunant (MAx25); ");
	Soul (Vid & Locat)
	sauf ('ilid') & could; paint ('Enter 11 d clavery); for (1=0; 1 < court; i+1)
	6x (1=0; / < count; i++)
	Sanf (" /· (f", lamber (12));
	gackrouf (wimber, 0, coal -1);
	Desired (The contex ordex is: 1:
	printy ("The sorter order is: "); Jose Ci-O; i'cocent si-(+)
	should (, 1.19, compar (17).
	return o;
	* Refund 0 /

SOURCE CODE

```
#include<stdio.h>
void quicksort(double number[25],int first,int last){
int i, j, pivot, temp;
if(first<last){</pre>
pivot=first;
i=first;
j=last;
while(i<j){
while(number[i]>=number[pivot]&&i<last)</pre>
i++;
while(number[j]<number[pivot])</pre>
j--;
if(i < j){
temp=number[i];
number[i]=number[j];
number[j]=temp;
}
temp=number[pivot];
number[pivot]=number[j];
number[j]=temp;
quicksort(number,first,j-1);
quicksort(number,j+1,last);
}
int main(){
int i,count;
double number[25];
printf("Enter some elements (Max. - 25): ");
scanf("%d",&count);
printf("Enter %d elements: ", count);
for(i=0;i<count;i++)</pre>
scanf("%lf",&number[i]);
quicksort(number,0,count-1);
```

```
printf("The Sorted Order is: ");
for(i=0;i<count;i++)
printf(" %lf",number[i]);
return 0;
}
OUTPUT</pre>
```

```
Enter some elements (Max. - 25): 5

Enter 5 elements: 3 1 5 6 7

The Sorted Order is: 7.000000 6.000000 5.000000 3.000000 1.000000

PS C:\Users\KIIT\Desktop\New folder\Git_Code\DSA ASSIGNMENTS>
```

Q4. WAP to sort an array of n integers in a descending order using insertion sort.

us	Date: / / Page
	Tadady 301 ii
	Cuar (1)
	ful will be a
	lat am (69)
	from (" File
	Scaref (" Futor mo- of elevents (vi);
	Parust ("E
-	by to District on lu , u)
	(1 (1 (d) (1+1))
	for G=0; itu; i++)! sconf (1.1.0", ear (i]),
	1++ 1 1 1 1 rd
_	βκ (i= 1; i(= α j i) ++)
	121,00000000000000000000000000000000000
	a Like Cjrose von TjUl ave Gil
	Liverber Potrok = munber (H)
	temp = are (il : quest = 1:) whom
	world = are li-your marking
	puid nout (ene of gus -: [+:] rote:
	2 5 ;
	1
	painty l'Sonted list in descending order: la t
	paint 1 2011 ted list in descending order: la ti
#	
	Subult Futor some downed (MAX.)-25); !:
	print (1.8 la, argili)
	party (Enter 1. & durants: , wealth
	furty ("1.8" la, ary (j.); return 0, (+1) towns 1.000 land
	Level (" 1. (fundbox (i));
	exist your (must be a count of ;
	Dury ("The states order is");
	A
-	pace (100 to count pite)

SOURCE CODE

```
#include <stdio.h>
int main()
{
  int n, i, j, temp;
  int arr[64];
  printf("Enter number of elements\n");
  scanf("%d", &n);
  printf("Enter %d integers\n", n);
  for (i = 0; i < n; i++)
  {
    scanf("%d", &arr[i]);
  }
  for (i = 1; i \le n - 1; i++)
  {
       j = i;
      while (j > 0 \&\& arr[j-1] < arr[j])
      {
         temp = arr[j];
         arr[j] = arr[j-1];
         arr[j-1] = temp;
         j--;
      }
  }
  printf("Sorted list in descending order:\n");
  for (i = 0; i \le n - 1; i++)
  {
    printf("%d\n", arr[i]);
  }
  return 0;
}
```

```
Enter number of elements

5
Enter 5 integers
3 4 1 5 6
Sorted list in descending order:
6
5
4
3
1
PS C:\Users\KIIT\Desktop\New folder\Git_Code\DSA ASSIGNMENTS> []
```

Q5. WAP to store n floats in linked list and sort them using selection sort.

	Date: / Page
5	#
	#Tudud stollib. hy
	demodel court and
	after some way
	fluat data,
	Showed Node + Cuk,
-	2 cus de j
-	was + hero = NULL;
-	York prepared (),
	vord scuap (asole + p1, les & *pl),
	Void Selection Sort (wode + lund)
	Moderal (fort data fort patrical)
	Judien of the state of the stat
	week (a, 1) has they beal case beauth transit to
	fegister (L, L)
	(45 - 1 1 4) . The the (4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	(usort (1,4),
	(1207) (120) + (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (120) (12
	pacing (1;
	selection so mo (lund / i loss) - Noval & good
	preint l'la Affer sombing: 1/2
	1 to with 1.
	perform 0; they = second & about
	1 1 tool 11 tool
	Yord Selection sout (mode # level)
	I was a second of the second o
	wade 4 sport = heads - NING to the to the stand
	unde + forwarte;
	hade * auto; joint & book some
	while (Short + COIN) / most - I tilk workers
	uiu ; trotz= win
	forenew = I forthink; Who box
	while becaretel }

[Carin- I data Iteratorise + data) Date: / / Page) onia-largersy proverse - quarapexinki Start i short & Cluk; 1 (19 * 20 cm) (4 2) cm) que * 21) p float temp = pirdata,

fladata = pirdata,

fladata = pirdata, void insent (flood of a flood position) dente - rolate = olas of charge == 1) Leup & Cick-head;

head = fough;

setatu; }

ande * fragerse = head; float & !; pr (i=0; ilposifice >; it) foreworse = se rosestiak, soup of GUK = traverte or Cick; void print()/
unde *p = head; because startists + later and of the

```
Date: / | Page
(33:16) no (10-1) no
```

SOURCE CODE

#include<stdio.h>
#include<stdlib.h>

```
typedef struct Node
{
     float data;
     struct Node *link;
}node;

node *head = NULL;
```

```
void print();
void swap(node *p1, node*p2);
void SelectionSort(node *head);
void insert(float data, float position);
float main()
     insert(4,1);
     insert(2,2);
     insert(3,3);
     insert(1,4);
     insert(0,5);
     printf("\n Before sorting = ");
     print();
     SelectionSort(head);
     printf("\n After sorting = ");
     print();
     return 0;
}
void SelectionSort(node *head)
{
     node *start = head;
     node *traverse;
     node *min;
     while(start->link)
```

```
{
          min = start;
          traverse = start->link;
          while(traverse)
          {
                if( min->data > traverse->data )
                {
                     min = traverse;
                }
                traverse = traverse->link;
          swap(start,min);
          start = start->link;
     }
}
void swap(node *p1, node*p2)
{
     float temp = p1->data;
     p1->data = p2->data;
     p2->data = temp;
}
void insert(float data, float position)
{
     node* temp = (node*)malloc(sizeof(node));
     temp->data = data;
     temp->link = NULL;
     if(position==1)
```

```
temp->link = head;
     head = temp;
     return;
     }
     node *traverse = head;
     float i;
     for(i=0; i<position-2; i++)</pre>
     traverse = traverse->link;
     temp->link = traverse->link;
     traverse->link = temp;
}
void print()
{
     node *p = head;
     while(p)
     {
           printf(" %f",p->data);
           p = p - \sinh;
     printf(" \n\n");
}
```

```
Before sorting = 4.000000 2.000000 3.000000 1.000000 0.000000

After sorting = 0.000000 1.000000 2.000000 3.000000 4.000000

PS C:\Users\KIIT\Desktop\New folder\Git_Code\DSA ASSIGNMENTS>
```

Q6. WAP to store n floats in linked list and sort them using bubble sort. $\underline{\text{HANDWRITTEN CODE}}:$

	Date: / / Page
67	#lududo deduo.ch
-	#include x stdCib.us
	Sound Node)
	Just data;
	How & show to speck 2
	C.
	word inscribed the Beggin (struck wode + sport negotial dish);
	rosd bubble sont (strenct was tstart)
	Yord scrop (strand node #a, strend Node #6),
	Yord prejut_1st (strant Node * stoort).
	lot auroll
	flood aux 67 - 21,1,1,2,2,3,1.4,1.5,93,
	flood ust sizes
	10811
	Struct Noou *Stort = NULL,
	Jon (i=0;1(6; i+f)
	Viley LALTE Angle (school , and CT);
	Yntery (" la liaked list before sorting. le")
	prejutlist (start);
	babble out (stand);
	prescett l'is la liked l'd affor posedoug. Il"
	gasiablist (start)
	getdivil),
	rectary 0;
	1
	Void insertatthe begin I struck wade ** start ref.
	strenct Node * ptm 1 = [strenct Note *) malloc (fig eg)(strence
	phil +data = data,
	port sacret = # start reof, # start neg = port;
	2
	I wid a sel off almost he of the selection
	void print of struct No de MS tart)
	shows Node *feep = Sfort;

```
SOURCE CODE
#include<stdio.h>
#include<stdlib.h>
struct Node
{
     float data;
     struct Node *next;
};
void insertAtTheBegin(struct Node **start_ref, float data);
void bubbleSort(struct Node *start);
void swap(struct Node *a, struct Node *b);
void printList(struct Node *start);
int main()
{
     float arr[] = {1.1, 1.2, 2.3, 1.4, 1.5, 9};
     float list_size;
     int i;
     struct Node *start = NULL;
     for (i = 0; i < 6; i++)
           insertAtTheBegin(&start, arr[i]);
```

printf("\nLinked list before sorting : \n");

```
printList(start);
     bubbleSort(start);
     printf("\n\nLinked list after sorting : \n");
     printList(start);
     getchar();
     return 0;
}
void insertAtTheBegin(struct Node **start_ref, float data)
{
     struct Node* ptr1 = (struct Node*)malloc(sizeof(struct Node));
     ptr1->data = data;
     ptr1->next = *start_ref;
     *start_ref = ptr1;
}
void printList(struct Node *start)
{
     struct Node *temp = start;
     printf("\n");
     while (temp!=NULL)
     {
           printf("%f", temp->data);
           temp = temp->next;
     }
}
void bubbleSort(struct Node *start)
```

```
{
     float swapped, i;
     struct Node *ptr1;
     struct Node *lptr = NULL;
     if (start == NULL)
           return;
     do
     {
           swapped = 0;
           ptr1 = start;
           while (ptr1->next != lptr)
           {
                if (ptr1->data > ptr1->next->data)
                {
                      swap(ptr1, ptr1->next);
                      swapped = 1;
                ptr1 = ptr1->next;
           lptr = ptr1;
     while (swapped);
}
void swap(struct Node *a, struct Node *b)
{
     float temp = a->data;
     a->data = b->data;
     b->data = temp;
}
```

```
PS C:\Users\KIIT\Desktop\New folder\Git_Code\DSA ASSIGNMENTS
"; if ($?) { gcc Lab_Assignmnet_10_Q6.c -o Lab_Assignmnet_1
Linked list before sorting :
9.000000 1.5000000 1.4000000 2.3000000 1.2000000 1.1000000
Linked list after sorting :
1.1000000 1.20000000 1.40000000 1.50000000 2.30000000 9.00000000 []
```

DECLARATION

I hereby declare that,

☑ I have written the assignment in my own handwritting as mentioned in Handwritten Code Section.

☑ I have typed my source code in code editor and taken my own test case output after running of code.

Full Signature of the Student

