	PUNE INSTITUTE OF COMPUTER TECHNOLOGY PUNE - 411043	
	Department of Electronics & Telecommunication	
	ASSESMENT YEAR: 2021-2022	CLASS: SE-5
	SUBJECT: DATA STRUCTURES	
EXPT No:	LAB Ref: SE/2021-22/	Starting date: 8/11/2021
	Roll No:22108	Submission date: 20/11/2021
Title:	**Database Management (With Pointers)**	
Problem statement	Implement database management using array of structures **A. With pointers to arrays B. Without pointers to arrays** 1. Create, 2. Display, 3. Modify, 4. Append, 5. Search 6. Sort.	
Prerequisites:	Basics of C programming	
	Decision making and loop controls	
	Choice based program	
Objectives:	Learn to create a structure, display structure.	
	Implement various operation on structure to understand its effect on data.	
	Verify operation with and without pointer	
Theory:		

	Array – It is a collection of similar data types stored in computer's memory. Similar datatypes means that the data stored in an array should have same data type. For Example – int arr [20] stores only integers, char arr [10] stores only characters. And it is a derived datatype. **Structures** - A structure is a user defined data type in C/C++. A structure creates a data type that can be used to group items of possibly different types into a single type. For example – we can have int, char, string and other data types in one structure. **Functions** - • It is a self-contained block of statements that perform task of some kind. • C program may have one or more functions • C program must have at least one function i.e. main() • There is no limit on number of functions • Each function is called in a sequence specified by the function calls in main() • After each function has done its job, control returns to next location from where it has been called.

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Pointers –

- The pointer in C language is a variable which stores the address of another variable. This variable can be of type int, char, array, function, or any other pointer. The size of the pointer depends on the architecture. However, in 32-bit architecture the size of a pointer is 2 byte.
- The pointer in c language can be declared using * (asterisk symbol). It is also known as indirection pointer used to dereference a pointer.
- The general form of a pointer variable declaration is − type *var-name;

Declaring a Structure: #include<stdio.h> struct comp

{ char name

[10];

int age;

float height;

char

symbol;

}a[5]; int

main()

{ scanf("%d", &a[0].age); \\ asking user for

value.

return 0;

}

Algorithm	1) Algorithm for create a structure • Start • Declare a structure component with different data type variables in it with array a[]. • Ask user to enter how many records he wants in the structure (size). • For(int i = 0;i<size;i++) • Scan all structure element one by one • End for loop • End 2) Algorithm to display a structure

•
•

Start
Declare a structure component with different data type variables in it with array a[].

- Ask user to enter how many records he wants in the structure (size).
- For(int i = 0;i<size;i++)
- Scan all structure element one by one
- End for loop
- For(int i=0;i<size;i++)
- Print all structure element one by one
- End for Loop
- End

3) Algorithm to Insert a record to structure

- Start
- Declare a structure component with different data type variables in it with array a[].
- Ask user to enter how many records he wants in the structure (size).
- For(int i = 0;i<size;i++)
- Scan all structure element one by one
- End for loop
- Ask user the new record to be inserted, here the new record will be at last thus (size) will be its index.

For example – scanf("%d", &a[size].age); •
End

4) Algorithm to delete record in the structure.

- Start
- Declare a structure component with different data type variables in it with array a[].
- Ask user to enter how many records he wants in the structure (size).
- For(int i = 0;i<size;i++)
- Scan all structure element one by one
- End for loop
- Declare variable for position or serial no. of record int del_index; • Ask user to enter the position or serial no. of record.
- For (i=del_index- 1; i<size; i++)
- a[i] = a[i+1];
- End of loop
- Size--;
- Print the database
- End

5) Algorithm to modify a record in structure.

- Start
- Declare a structure component with different data type variables in it with array a[].
- Ask user to enter how many records he wants in the structure (size).
- For(int i = 0;i<size;i++)

-
-

-
-

-
-

Scan all structure element one by one
End for loop

- Declare a variable for the position or serial no. of record which needs to be modified (mod_index) and new structure array y for storing the modified data.
- Ask user for position or serial no. of record to be modified and the new data of the record.
- For (i = 0; i < size; i++) if (i == mod_index-1)
  {
  a[i] = y; // storing the data in main array at position = mod_index-1
  break;
  }
- End of for loop
- Print the database
- End

6) Algorithm to search a record in structure

- Start
- Declare a structure component with different data type variables in it with array a[].
- Ask user to enter how many records he wants in the structure (size).
- For(int i = 0;i<size;i++)
- Scan all structure element one by one
- End for loop
- Declare a variable for serial no. of record to be searched (search_index) and variable for storing the index of the record found according to search_index (found_index)
- Ask the user for the serial no. of record to be searched.
- for (int i = 0; i < size; i++)
- if (a[i].sr_no = search_index) found_index = i; else End
- If the if condition is satisfied and found_index is assigned an interger value which is an index of the record, we will then print every data of the respective record.
  for example – printf("%d", a[found_index].value), where value is a parameter in the structure.
- End

7) Algorithm to sort the records according to cost.

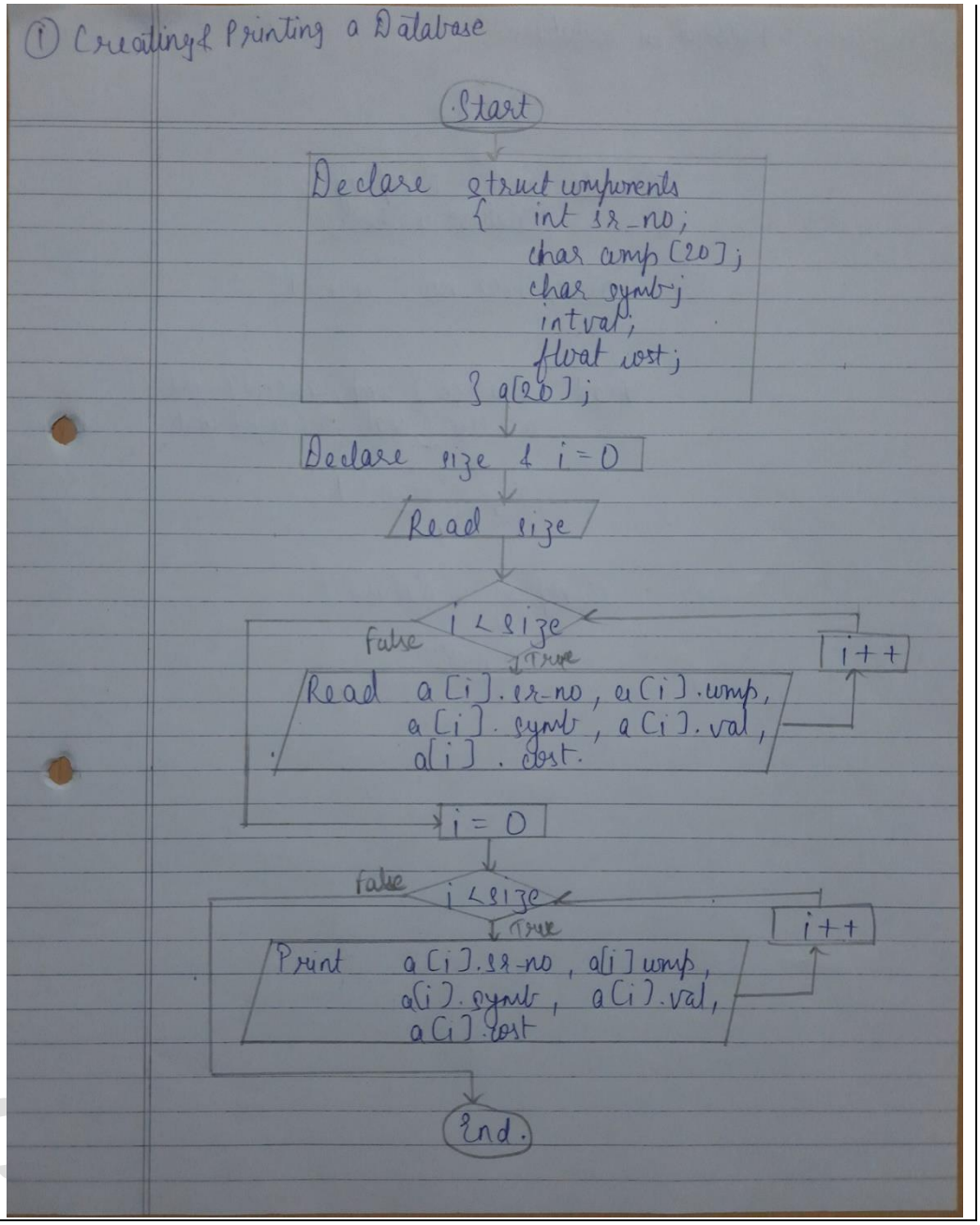
- Start
- Declare a structure component with different data type variables in it with array a[].

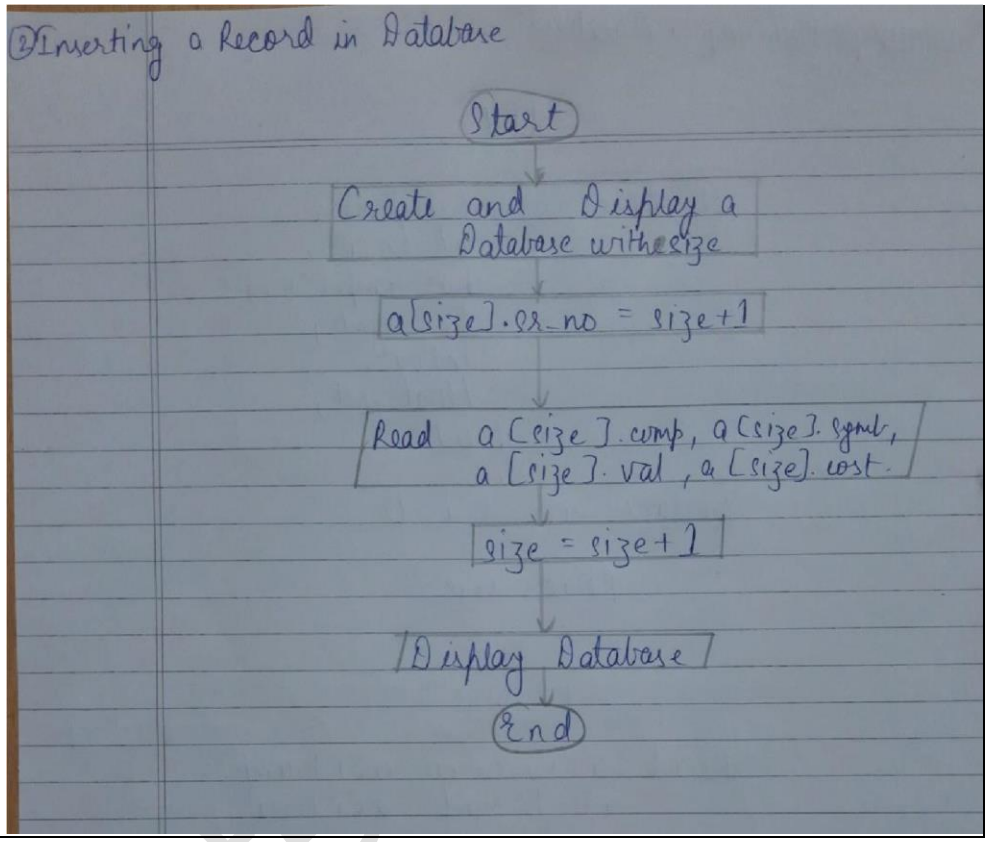
- Ask user to enter how many records he wants in the structure (size).
- For(int i = 0;i<size;i++)

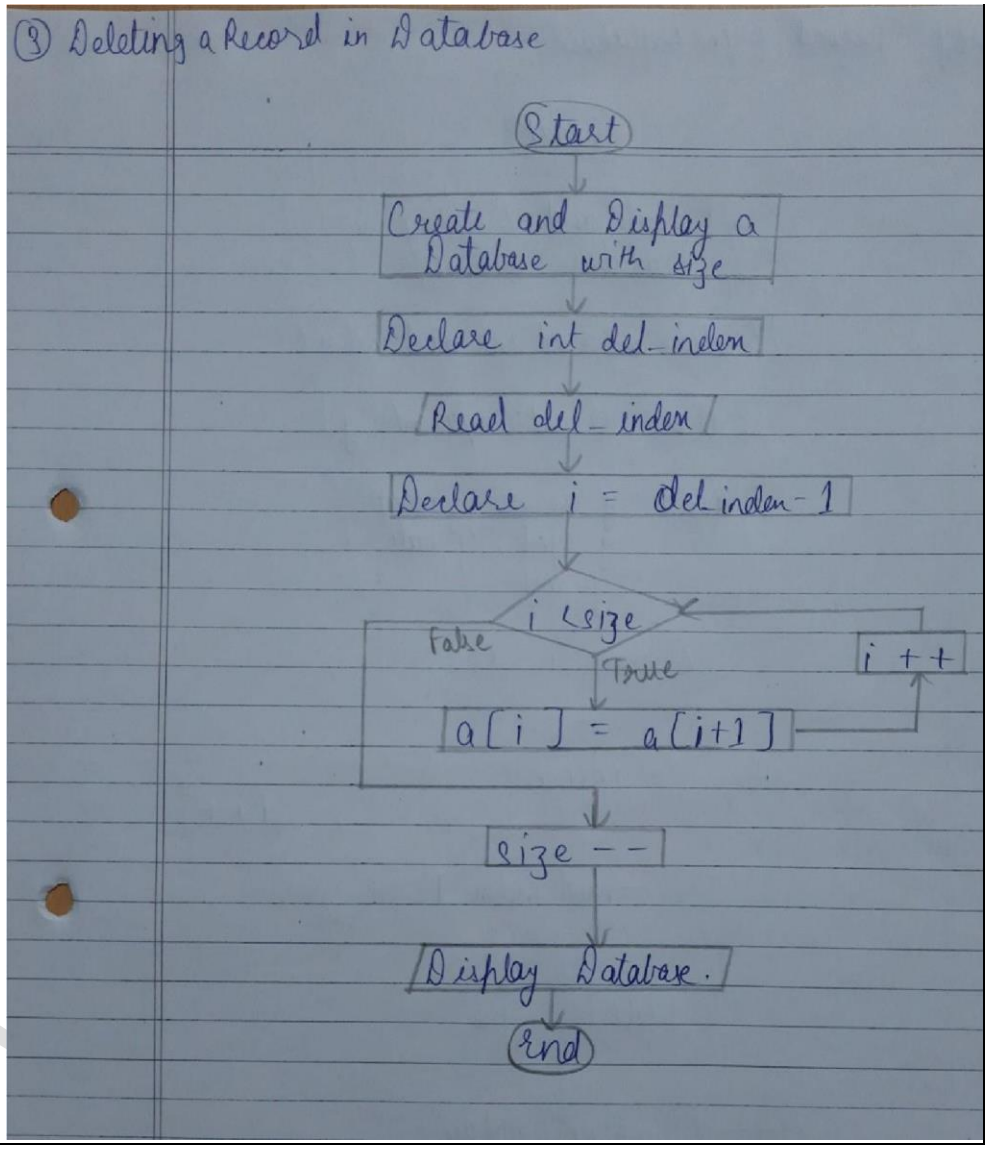
-
-

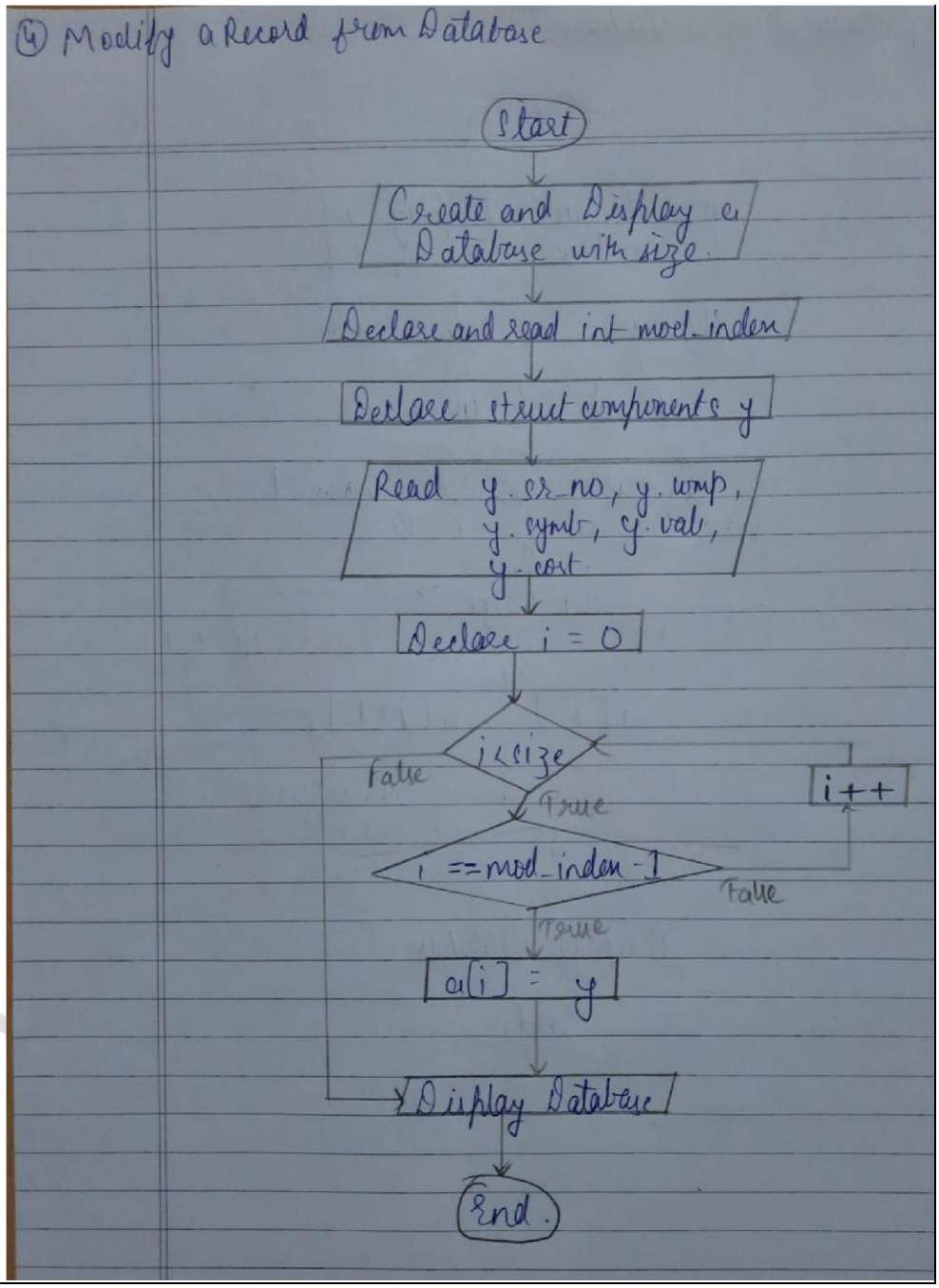
	Scan all structure element one by one End for loop • Declare an array in structure component temp • for (int i = 0; i < size; i++) for (int j = 0; j < size-i; j++) if (a[j].cost>a[j+1].cost) { temp[0] = a[j]; a[j] = a[j+1]; a[j+1] = temp[0]; } • End of inner for loop • End of outer loop • Print the database • End

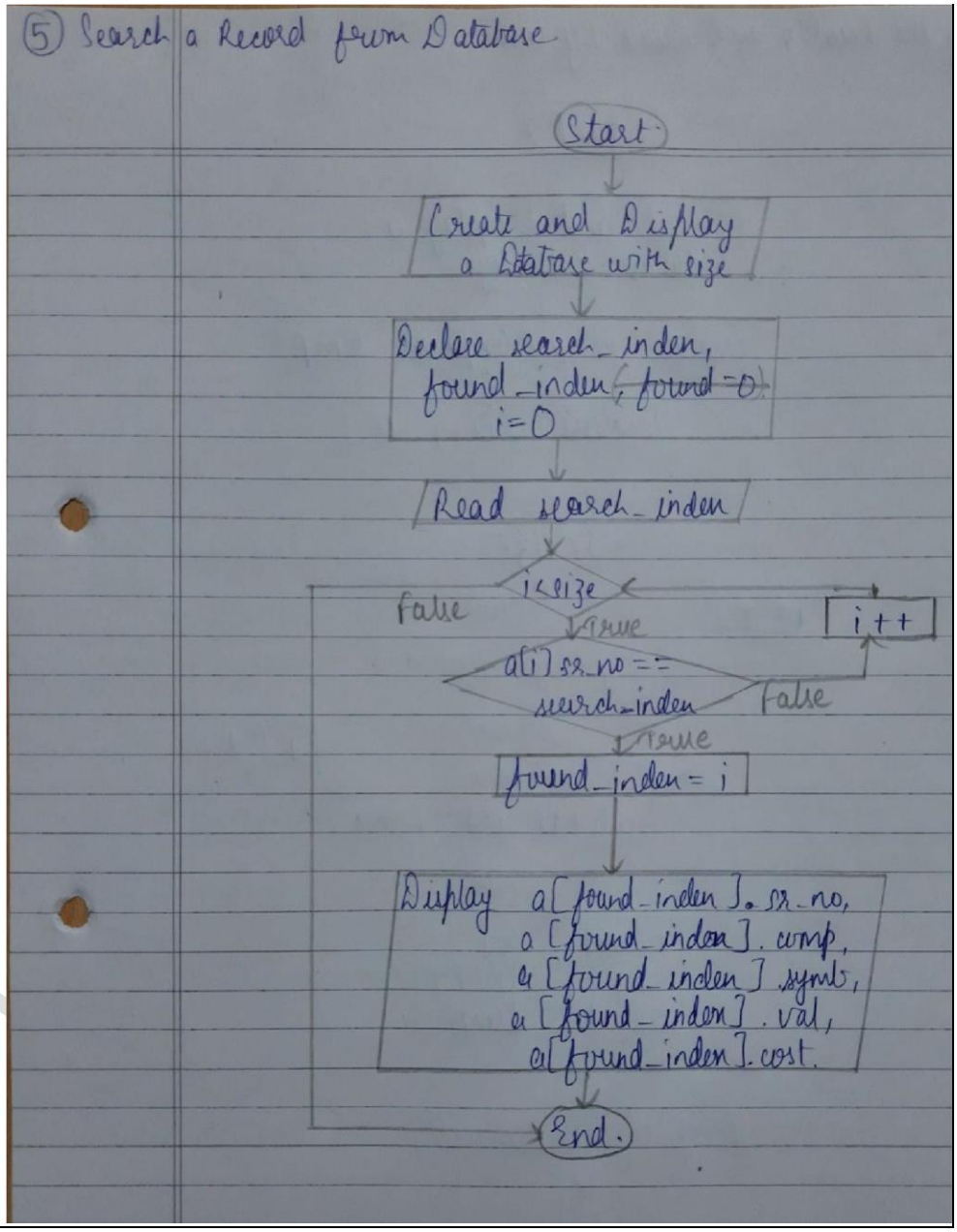
Flow-chart

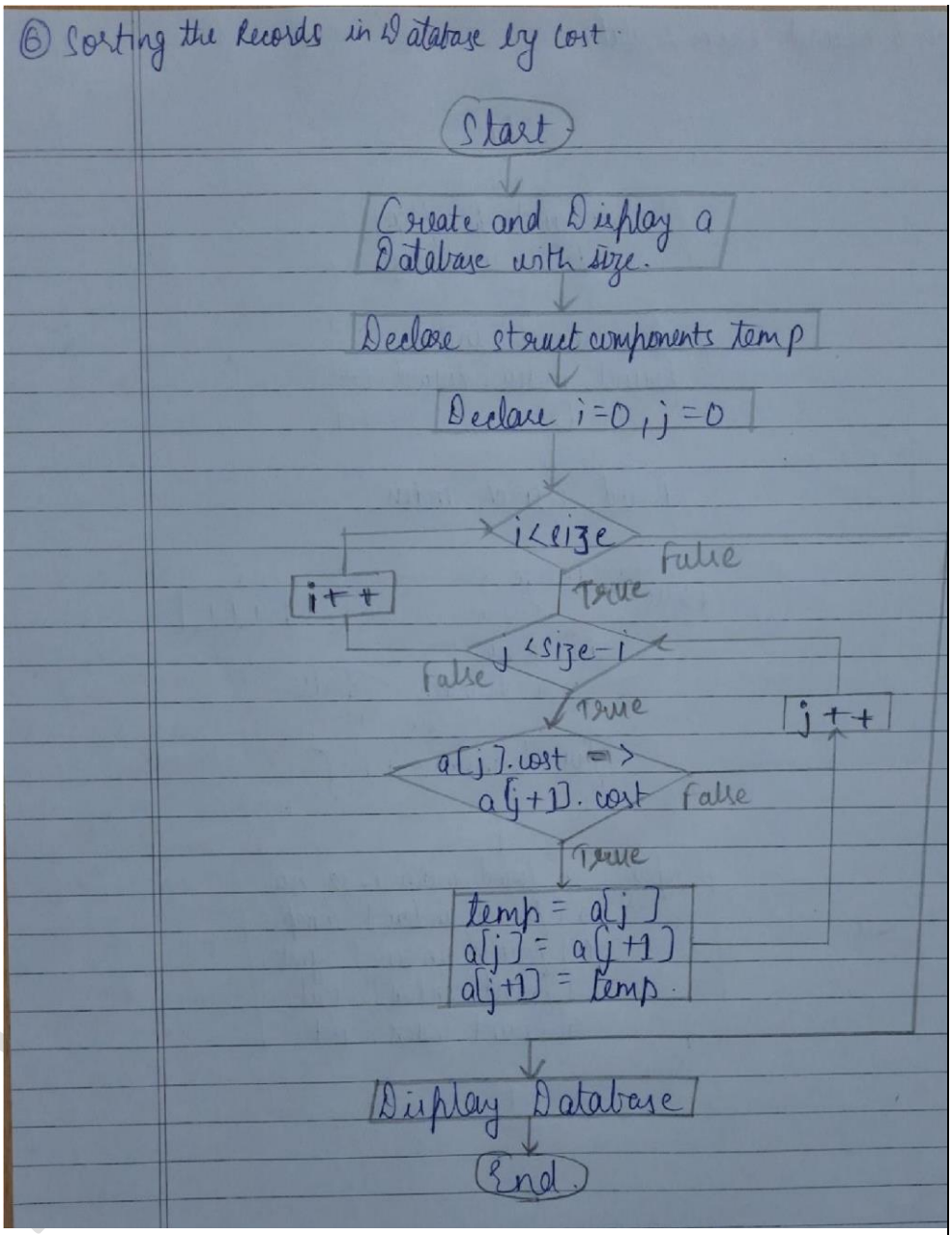

① Creating & Printing a Database
Start
Declare struct components
{ int sr_no;
char comp[20];
char symb;
int val;
float cost;
} a[20];
Declare size & i = 0
Read size
i < size
False
True
i++
Read a[i].sr_no, a[i].comp,
a[i].symb, a[i].val,
a[i].cost.
i = 0
i < size
False
True
i++
Print a[i].sr_no, a[i].comp,
a[i].symb, a[i].val,
a[i].cost
End.


②Inserting a Record in Database
Start
Create and Display a Database with size
a[size].sr_no = size+1
Read a[size].comp, a[size].symb, a[size].val, a[size].cost.
size = size+1
Display Database
End


③ Deleting a Record in Database
Start
Create and Display a Database with size
Declare int del_index
Read del_index
Declare i = del_index - 1
i < size
False
True
i ++
a[i] = a[i+1]
size --
Display Database.
End


④ Modify a Record from Database
Start
Create and Display a Database with size
Declare and read int mod_inden
Declare struct components y
Read y.sr_no, y.emp, y.symb, y.val, y.cost
Declare i = 0
i<size
False
True
i++
i == mod_inden - 1
False
True
a[i] = y
Display Database
End.


5 Search a Record from Database
Start
Create and Display a Database with size
Declare search_inden, found_inden, found=0, i=0
Read search_inden
i<size
false
true
i++
a[i].sr_no == search_inden
false
true
found_inden = i
Display a[found_inden].sr_no, a[found_inden].comp, a[found_inden].symb, a[found_inden].val, a[found_inden].cost.
End.

	
ERROR and REMEDY	-

Code

```
#include <stdio.h>
#include <conio.h> #include
<string.h>
int size, i;
struct components
{
   int sr_no;
char comp[10];
   char symb;
int val;     float
cost;
} a[20];
void print_struct(struct components *ptr)
{
   printf("The component table is:\n");
   printf("+-----+--------------------------------+--------+------------+-----------
+\n");     printf("|Sr.No|\t\tName of Component\t| Symbol |  Value  |    Cost
|\n");     printf("+-----+--------------------------------+--------+-----------+------
------
+\n");
   for (i = 0; i < size; i++)
   {
      printf("|  %d  |      %s     |    %c   |  %d   |  %f  |\n", (ptr + i)->sr_no, (ptr +
i)-
>comp, (ptr + i)->symb, (ptr + i)->val, (ptr + i)->cost);
      printf("+-----+--------------------------------+--------+-----------+-----------
+\n");
   }
}

void end() {
   printf("\n----------This is the end of execution----------");
}

void accept_data(struct components *ptr)
```

```
{
   for (i = 0; i < size; i++)
   {
      printf("\nEnter the Serial Number of Component: ");
scanf("%d", &(ptr + i)->sr_no);

      if ((ptr + i)->sr_no > size || (ptr + i)->sr_no <= 0)
      {
         printf("Please Enter serial number between 1 and %d.", size);
continue;
      }

      printf("Enter the component %d name: ", (ptr + i)->sr_no);
scanf("%s", &(ptr + i)->comp);
      printf("Enter the component %d symbol: ", (ptr + i)->sr_no);
scanf(" %c", &(ptr + i)->symb);
      printf("Enter the component %d value: ", (ptr + i)->sr_no);
scanf("%d", &(ptr + i)->val);
      printf("Enter the component %d cost: ", (ptr + i)->sr_no);
scanf("%f", &(ptr + i)->cost);
   }

   struct components temp;
for (i = 0; i < size; i++)
   {
```

```
      for (int j = 0; j < size - i; j++)
       {            if ((ptr + j)->sr_no > (ptr + j + 1)-
>sr_no)
          {
             temp = *(ptr + j);
*(ptr + j) = *(ptr + j + 1);
             *(ptr + j + 1) = temp;
          }
       }
}
   print_struct(ptr);
}

void insert_struct(struct components *ptr)
{
   printf("\nPlease enter the new component's name, symbol, value and
cost.");
   (ptr+size)->sr_no = size + 1;
   printf("\nEnter the component %d name: ", size + 1);
scanf("%s", &(ptr+size)->comp);
   printf("\nEnter the component %d symbol: ", size + 1);
scanf(" %c", &(ptr+size)->symb);
   printf("\nEnter the component %d value: ", size + 1);
scanf("%d", &(ptr+size)->val);
   printf("\nEnter the component %d cost: ", size + 1);
scanf("%f", &(ptr+size)->cost);
   size++;
print_struct(ptr);
}

void del_struct(struct components *ptr)
{    int
del_index;
   printf("\nPlease Enter the Sr. No of the component to delete:
");     scanf("%d", &del_index);     if (del_index < 0 || del_index
> size)
   {
      printf("Invalid Entry!, try again");
      return;
   }
   for (i = del_index - 1; i < size; i++)
   {
      *(ptr + i) = *(ptr + i + 1);
```

```
   }     size--;
print_struct(ptr);
}

void modify_struct(struct components *ptr)
{
   int mod_index;     struct
components y, *yptr;     yptr
= &y;
   printf("\nEnter the Sr.No of the component which needs to be modified:");
scanf("%d", &mod_index);
   if (mod_index <= 0 || mod_index > size)
   {
      printf("Invalid Entry!, Try again");
      return;
   }

   printf("\nEnter the component serial no.: ");
   scanf("%d", &yptr->sr_no);
   printf("\nEnter the component %d name: ", yptr->sr_no);
scanf("%s", &yptr->comp);
   printf("\nEnter the component %d symbol: ", yptr->sr_no);
scanf(" %c", &yptr->symb);
   printf("\nEnter the component %d value: ", yptr->sr_no);
scanf("%d", &yptr->val);
   printf("\nEnter the component %d cost: ", yptr->sr_no);
scanf("%f", &yptr->cost);

   for (i = 0; i < size; i++)
   {
      if (i == mod_index - 1)
      {
         *(ptr + i) = *yptr;
         break;
      }
}
   print_struct(ptr);
}

void search_struct(struct components *ptr)
{
```

```
    int search_index, found_index, found = 0;
    printf("Enter the serial no. component which needs to be searched:
");     scanf("%d", &search_index);     for (int i = 0; i < size; i++)
    {
        if ((ptr + i)->sr_no == search_index)
        {
            found_index =
i;              found = 1;
break;
        }
    }
    if (found == 0)
    {
      printf("There was no %d serial number in the records!", search_index);
      return;
    }
    printf("Sr. No = %d\n", (ptr+found_index)->sr_no);
printf("Name of Component = %s\n", (ptr+found_index)->comp);
printf("Symbol =  %c\n", (ptr+found_index)->symb);
printf("Value = %d\n", (ptr+found_index)->val);     printf("Cost =
%f\n", (ptr+found_index)->cost);
}

void sort_struct(struct components *ptr)
{
    printf("Sorting the database according to cost.");
struct components temp, *tempptr;
    for (i = 0; i < size; i++)
    {
        for (int j = 0; j < size - i; j++)
        {
            if (a[j].cost > a[j + 1].cost)
            {
                *tempptr = *(ptr+j);
                *(ptr+j) = *(ptr+j + 1);
                *(ptr+j + 1) = *tempptr;
            }
        }
}
    print_struct(ptr);
}
```

```
int main() {     int checker;     printf("----------------Database Manager!!!!----------
-----");     printf("\nDo you want to enter data records and perform operation on
them?
(yes = 1/no = 0): ");
scanf(" %d", &checker);
   if (checker == 0)
   {
      printf("\nOK!, if you want to perform the operation press y next time!");
return 0;
   }
   printf("\nSo as you have entered 'y' and you want to perform operations on the
database you have, first you have to enter the number of records when prompted
and then the records serial wise.\n");     printf("Enter the size of the table: ");
   scanf("%d", &size);

   struct components a[20], *ptr;
ptr = &a[0];

   printf("\nPlease enter the components.");
accept_data(a);     int choice;
   printf("\nThere are 3 operations,\n1) Insert\n2) Delete\n3) Modify\n4)
Search\n5) Sort by Cost\n6) Exit");

   printf("\nEnter the number of the respective operation: ");
scanf("%d", &choice);

   switch (choice)
   {
   case 1: //Insert Operation
   {
      printf("\nYou have chosen Insert Operation!");
printf("\n");        insert_struct(ptr);
      end();
break;
   }
   case 2: //Delete Operation
   {
```

```
        printf("\nYou have chosen Delete
Operation!");        printf("\n");        del_struct(ptr);
end();        break;
    }
    case 3: //Modify Operation
    {
        printf("\nYou have chosen Modify
Operation!");        printf("\n");
modify_struct(ptr);
        end();
break;
    }
    case 4: //Search Operation by Sr.No
    {
        printf("\nYou have chosen Search
Operation");        printf("\n");
search_struct(ptr);
        end();
break;
    }
    case 5: //Sort Operation by Cost
    {
        printf("\nYou have chosen Sort Operation by
Cost");        printf("\n");        sort_struct(ptr);
```

```
        end();
        break;
    }
    case 6: //Exit
    {
        printf("----------This is the end of execution!----------");
return 0;
    }
default:
    {
        printf("Please enter the valid number!, try again.");
break;
    }
    }

    return 0;
}
```

Output

1) Insert Operation

----------Database Manager!!!!----------

Do you want to enter data records and perform operation on them? (yes = 1/no = 0): 1

So as you have entered 'y' and you want to perform operations on the database you have, first you have to enter the number of records when prompted and then the records serial wise. Enter the size of the table: 4

Please enter the components.

Enter the Serial Number of Component: 1

Enter the component 1 name: Resistor

Enter the component 1 symbol: R

Enter the component 1 value: 1000

Enter the component 1 cost: 1.555

Enter the Serial Number of Component: 2

Enter the component 2 name: Capacitor

Enter the component 2 symbol: C

Enter the component 2 value: 4700

Enter the component 2 cost: 3.50

Enter the Serial Number of Component: 3

Enter the component 3 name: Inductor

Enter the component 3 symbol: L

Enter the component 3 value: 110

Enter the component 3 cost: 2.75

Enter the Serial Number of Component: 4

Enter the component 4 name: Transistor

Enter the component 4 symbol: Q

Enter the component 4 value: 547

Enter the component 4 cost: 8.75 The component table is:

```
+-----+--------------------------------+--------+-----------+-----------+
|Sr.No|        Name of Component       | Symbol |  Value  |    Cost   |
+-----+--------------------------------+--------+-----------+-----------+
|  1  |     Resistor     |    R   |  1000   |  1.555000  |
+-----+--------------------------------+--------+-----------+-----------+
|  2  |     Capacitor    |    C   |  4700   |  3.500000  |
+-----+--------------------------------+--------+-----------+-----------+
|  3  |     Inductor     |    L   |  110    |  2.750000  |
+-----+--------------------------------+--------+-----------+-----------+
|  4  |     Transistor   |    Q   |  547    |  8.750000  |
```

```
+-----+--------------------------------+--------+-----------+------------+
```

There are 3 operations,
1) Insert
2) Delete
3) Modify
4) Search
5) Sort by Cost
Enter the number of the respective operation: 1

You have chosen Insert Operation!

Please enter the new component's name, symbol, value and cost.
Enter the component 5 name: Battery

Enter the component 5 symbol: V

Enter the component 5 value: 9

Enter the component 5 cost: 1.5
The component table is:

```
+-----+--------------------------------+--------+------------+-----------+
|Sr.No|      Name of Component        | Symbol |  Value  |    Cost    |
+-----+--------------------------------+--------+-----------+------------+
| 1 |     Resistor    |   R  | 1000  | 1.555000 |
+-----+--------------------------------+--------+-----------+------------+
| 2 |     Capacitor    |   C  | 4700  | 3.500000 |
+-----+--------------------------------+--------+-----------+------------+
| 3 |     Inductor    |   L  | 110  | 2.750000 |
+-----+--------------------------------+--------+-----------+------------+
| 4 |     Transistor    |   Q  | 547  | 8.750000 |
+-----+--------------------------------+--------+-----------+------------+
| 5 |     Battery    |   V  | 9  | 1.500000 |
+-----+--------------------------------+--------+-----------+------------+
```

----------This is the end of execution----------

2) Delete Operation

Successful:

```
----------Database Manager!!!!----------
Do you want to enter data records and perform operation on them? (yes = 1/no
= 0): 1
So as you have entered 'y' and you want to perform operations on the database you have, first you have to enter the number  of records when prompted and then the records serial wise.
Enter the size of the table: 4

Please enter the components.
Enter the Serial Number of Component: 1
Enter the component 1 name: Resistor
Enter the component 1 symbol: R
Enter the component 1 value: 1000
Enter the component 1 cost: 1.555

Enter the Serial Number of Component: 2
Enter the component 2 name: Capacitor
Enter the component 2 symbol: C
Enter the component 2 value: 4700
Enter the component 2 cost: 3.50

Enter the Serial Number of Component: 3
Enter the component 3 name: Inductor
Enter the component 3 symbol: L
Enter the component 3 value: 110
Enter the component 3 cost: 2.75

Enter the Serial Number of Component: 4
Enter the component 4 name: Transistor
Enter the component 4 symbol: Q
Enter the component 4 value: 547
Enter the component 4 cost: 8.75
The component table is:
+-----+--------------------------------+--------+-----------+-----------+
|Sr.No|        Name of Component      | Symbol |  Value  |    Cost   |
+-----+--------------------------------+--------+-----------+-----------+
| 1 |     Resistor    |   R  | 1000  | 1.555000 |
+-----+--------------------------------+--------+-----------+-----------+
| 2 |     Capacitor    |   C  | 4700  | 3.500000 |
+-----+--------------------------------+--------+-----------+-----------+
| 3 |     Inductor    |   L  | 110  | 2.750000 |
```

```
+-----+--------------------------------+--------+-----------+------------+
| 4 |     Transistor    |    Q   | 547   | 8.750000 |
+-----+--------------------------------+--------+-----------+------------+
```

There are 3 operations,
1) Insert
2) Delete
3) Modify
4) Search
5) Sort by Cost

Enter the number of the respective operation: 2

You have chosen Delete Operation!

Please Enter the Sr. No of the component to delete: 3
The component table is:

```
+-----+--------------------------------+--------+-----------+------------+
|Sr.No|        Name of Component      | Symbol |  Value  |    Cost    |
+-----+--------------------------------+--------+-----------+------------+
| 1 |     Resistor    |    R   | 1000   | 1.555000 |
+-----+--------------------------------+--------+-----------+------------+
| 2 |     Capacitor    |    C   | 4700   | 3.500000 |
+-----+--------------------------------+--------+-----------+------------+
| 4 |     Transistor    |    Q   | 547   | 8.750000 |
+-----+--------------------------------+--------+-----------+------------+
```

----------This is the end of execution----------

Unsuccessful:

----------Database Manager!!!!----------
Do you want to enter data records and perform operation on them? (yes = 1/no
= 0): 1
So as you have entered 'y' and you want to perform operations on the database you have, first you have to enter the number of records when prompted and then the records serial wise.
Enter the size of the table: 4

Please enter the components.
Enter the Serial Number of Component: 1
Enter the component 1 name: Resistor

Enter the component 1 symbol: R
Enter the component 1 value: 1000
Enter the component 1 cost: 1.555

Enter the Serial Number of Component: 2
Enter the component 2 name: Capacitor
Enter the component 2 symbol: C
Enter the component 2 value: 4700
Enter the component 2 cost: 3.50

Enter the Serial Number of Component: 3
Enter the component 3 name: Inductor
Enter the component 3 symbol: L
Enter the component 3 value: 110
Enter the component 3 cost: 2.75

Enter the Serial Number of Component: 4
Enter the component 4 name: Transistor
Enter the component 4 symbol: Q
Enter the component 4 value: 547
Enter the component 4 cost: 8.75
The component table is:

Sr.No	Name of Component	Symbol	Value	Cost
1	Resistor	R	1000	1.555000
2	Capacitor	C	4700	3.500000
3	Inductor	L	110	2.750000
4	Transistor	Q	547	8.750000

There are 3 operations,
1) Insert
2) Delete
3) Modify
4) Search
5) Sort by Cost
Enter the number of the respective operation: 2

You have chosen Delete Operation!

Please Enter the Sr. No of the component to delete: 5
Invalid Entry!, try again
----------This is the end of execution----------

3) Modify Operation

Successful:

----------Database Manager!!!!----------
Do you want to enter data records and perform operation on them? (yes = 1/no = 0): 1
So as you have entered 'y' and you want to perform operations on the database you have, first you have to enter the number of records when prompted and then the records serial wise.
Enter the size of the table: 4

Please enter the components.
Enter the Serial Number of Component: 1
Enter the component 1 name: Resistor
Enter the component 1 symbol: R
Enter the component 1 value: 1000
Enter the component 1 cost: 1.555

Enter the Serial Number of Component: 2
Enter the component 2 name: Capacitor
Enter the component 2 symbol: C
Enter the component 2 value: 4700
Enter the component 2 cost: 3.50

Enter the Serial Number of Component: 3
Enter the component 3 name: Inductor
Enter the component 3 symbol: L
Enter the component 3 value: 110
Enter the component 3 cost: 2.75

Enter the Serial Number of Component: 4
Enter the component 4 name: Transistor
Enter the component 4 symbol: Q
Enter the component 4 value: 547
Enter the component 4 cost: 8.75 The
component table is:

```
+-----+--------------------------------+--------+------------+-----------+
|Sr.No|        Name of Component       | Symbol |  Value  |    Cost    |
```

```
+-----+--------------------------------+--------+-----------+-----------+
| 1 |     Resistor     |    R   | 1000   | 1.555000 |
+-----+--------------------------------+--------+-----------+-----------+
| 2 |     Capacitor     |    C   | 4700   | 3.500000 |
+-----+--------------------------------+--------+-----------+-----------+
| 3 |     Inductor     |    L   | 110   | 2.750000 |
+-----+--------------------------------+--------+-----------+-----------+
| 4 |     Transistor     |    Q   | 547   | 8.750000 |
+-----+--------------------------------+--------+-----------+-----------+
```

There are 3 operations,

1) Insert
2) Delete
3) Modify
4) Search
5) Sort by Cost

Enter the number of the respective operation: 3

You have chosen Modify Operation!

Enter the Sr.No of the component which needs to be modified:1

Enter the component serial no.: 1

Enter the component 1 name: Resistor

Enter the component 1 symbol: R

Enter the component 1 value: 500

Enter the component 1 cost: 1

The component table is:

```
+-----+--------------------------------+--------+-----------+-----------+
|Sr.No|        Name of Component       | Symbol |  Value    |    Cost   |
+-----+--------------------------------+--------+-----------+-----------+
| 1 |     Resistor     |    R   | 500   | 1.000000 |
+-----+--------------------------------+--------+-----------+-----------+
| 2 |     Capacitor     |    C   | 4700   | 3.500000 |
+-----+--------------------------------+--------+-----------+-----------+
| 3 |     Inductor     |    L   | 110   | 2.750000 |
+-----+--------------------------------+--------+-----------+-----------+
| 4 |     Transistor     |    Q   | 547   | 8.750000 |
+-----+--------------------------------+--------+-----------+-----------+
```

----------This is the end of execution----------

Unsuccessful:

----------Database Manager!!!!----------

Do you want to enter data records and perform operation on them? (yes = 1/no = 0): 1

So as you have entered 'y' and you want to perform operations on the database you have, first you have to enter the number of records when prompted and then the records serial wise.

Enter the size of the table: 4

Please enter the components.

Enter the Serial Number of Component: 1

Enter the component 1 name: Resistor

Enter the component 1 symbol: R

Enter the component 1 value: 1000

Enter the component 1 cost: 1.555

Enter the Serial Number of Component: 2

Enter the component 2 name: Capacitor

Enter the component 2 symbol: C

Enter the component 2 value: 4700

Enter the component 2 cost: 3.50

Enter the Serial Number of Component: 3

Enter the component 3 name: Inductor

Enter the component 3 symbol: L

Enter the component 3 value: 110

Enter the component 3 cost: 2.75

Enter the Serial Number of Component: 4

Enter the component 4 name: Transistor

Enter the component 4 symbol: Q

Enter the component 4 value: 547

Enter the component 4 cost: 8.75

The component table is:

```
+-----+--------------------------------+--------+------------+-----------+
|Sr.No|        Name of Component       | Symbol |  Value  |    Cost    |
+-----+--------------------------------+--------+-----------+------------+
| 1 |     Resistor     |    R   |  1000   |  1.555000  |
```

```
+-----+--------------------------------+--------+-----------+------------+
| 2 |     Capacitor     |   C  | 4700  | 3.500000 |
+-----+--------------------------------+--------+-----------+------------+
| 3 |     Inductor     |   L  | 110  | 2.750000 |
+-----+--------------------------------+--------+-----------+------------+
| 4 |     Transistor     |   Q  | 547  | 8.750000 |
+-----+--------------------------------+--------+-----------+------------+
```

There are 3 operations,
1) Insert
2) Delete
3) Modify
4) Search
5) Sort by Cost
Enter the number of the respective operation: 3

You have chosen Modify Operation!

Enter the Sr.No of the component which needs to be modified:8
Invalid Entry!, Try again
----------This is the end of execution----------

4) Search Operation
Successful:
----------Database Manager!!!!----------
Do you want to enter data records and perform operation on them? (yes = 1/no
= 0): 1
So as you have entered 'y' and you want to perform operations on the database you have, first you have to enter the number of records when prompted and then the records serial wise.
Enter the size of the table: 4

Please enter the components.
Enter the Serial Number of Component: 1
Enter the component 1 name: Resistor
Enter the component 1 symbol: R
Enter the component 1 value: 1000
Enter the component 1 cost: 1.555

Enter the Serial Number of Component: 2
Enter the component 2 name: Capacitor
Enter the component 2 symbol: C

Enter the component 2 value: 4700
Enter the component 2 cost: 3.50

Enter the Serial Number of Component: 3
Enter the component 3 name: Inductor
Enter the component 3 symbol: L
Enter the component 3 value: 110
Enter the component 3 cost: 2.75

Enter the Serial Number of Component: 4
Enter the component 4 name: Transistor
Enter the component 4 symbol: Q
Enter the component 4 value: 547
Enter the component 4 cost: 8.75
The component table is:

Sr.No	Name of Component	Symbol	Value	Cost
1	Resistor	R	1000	1.555000
2	Capacitor	C	4700	3.500000
3	Inductor	L	110	2.750000
4	Transistor	Q	547	8.750000

There are 3 operations,
1) Insert
2) Delete
3) Modify
4) Search
5) Sort by Cost
Enter the number of the respective operation: 4

You have chosen Search Operation
Enter the serial no. component which needs to be searched: 2
Sr. No = 2
Name of Component = Capacitor
Symbol = C
Value = 4700

Cost = 3.500000

----------This is the end of execution----------

Unsuccessful:

----------Database Manager!!!!----------

Do you want to enter data records and perform operation on them? (yes = 1/no = 0): 1

So as you have entered 'y' and you want to perform operations on the database you have, first you have to enter the number of records when prompted and then the records serial wise.

Enter the size of the table: 4

Please enter the components.

Enter the Serial Number of Component: 1

Enter the component 1 name: Resistor

Enter the component 1 symbol: R

Enter the component 1 value: 1000

Enter the component 1 cost: 1.555

Enter the Serial Number of Component: 2

Enter the component 2 name: Capacitor

Enter the component 2 symbol: C

Enter the component 2 value: 4700

Enter the component 2 cost: 3.50

Enter the Serial Number of Component: 3

Enter the component 3 name: Inductor

Enter the component 3 symbol: L

Enter the component 3 value: 110

Enter the component 3 cost: 2.75

Enter the Serial Number of Component: 4

Enter the component 4 name: Transistor

Enter the component 4 symbol: Q

Enter the component 4 value: 547

Enter the component 4 cost: 8.75

The component table is:

```
+-----+--------------------------------+--------+------------+-----------+
|Sr.No|        Name of Component       | Symbol |  Value  |    Cost    |
+-----+--------------------------------+--------+-----------+------------+
| 1 |     Resistor     |    R   | 1000   | 1.555000 |
+-----+--------------------------------+--------+-----------+------------+
```

| 2 | Capacitor | C | 4700 | 3.500000 |
+-----+--------------------------------+--------+-----------+------------+
| 3 | Inductor | L | 110 | 2.750000 |
+-----+--------------------------------+--------+-----------+------------+
| 4 | Transistor | Q | 547 | 8.750000 |
+-----+--------------------------------+--------+-----------+------------+

There are 3 operations,
1) Insert
2) Delete
3) Modify
4) Search
5) Sort by Cost
Enter the number of the respective operation: 4

You have chosen Search Operation
Enter the serial no. component which needs to be searched: 9
There was no 9 serial number in the records!
----------This is the end of execution----------

5) Sort Operation
----------Database Manager!!!!----------
Do you want to enter data records and perform operation on them? (yes = 1/no = 0): 1
So as you have entered 'y' and you want to perform operations on the database you have, first you have to enter the number of records when prompted and then the records serial wise.
Enter the size of the table: 4

Please enter the components.
Enter the Serial Number of Component: 1
Enter the component 1 name: Resistor
Enter the component 1 symbol: R
Enter the component 1 value: 1000
Enter the component 1 cost: 1.555

Enter the Serial Number of Component: 2
Enter the component 2 name: Capacitor
Enter the component 2 symbol: C
Enter the component 2 value: 4700
Enter the component 2 cost: 3.50

Enter the Serial Number of Component: 3
Enter the component 3 name: Inductor
Enter the component 3 symbol: L
Enter the component 3 value: 110
Enter the component 3 cost: 2.75

Enter the Serial Number of Component: 4
Enter the component 4 name: Transistor
Enter the component 4 symbol: Q
Enter the component 4 value: 547
Enter the component 4 cost: 8.75 The
component table is:

Sr.No	Name of Component	Symbol	Value	Cost
1	Resistor	R	1000	1.555000
2	Capacitor	C	4700	3.500000

```
+-----+--------------------------------+--------+-----------+------------+
| 3 |     Inductor    |   L   | 110   | 2.750000  |
+-----+--------------------------------+--------+-----------+------------+
| 4 |     Transistor    |   Q   | 547   | 8.750000  |
+-----+--------------------------------+--------+-----------+------------+

There are 3 operations,
1) Insert
2) Delete
3) Modify
4) Search
5) Sort by Cost
Enter the number of the respective operation: 5
You have chosen Sort Operation by Cost
Sorting the database according to cost. The component table is:
+-----+--------------------------------+--------+-----------+-----------+
|Sr.No|        Name of Component       | Symbol |  Value    |    Cost   |
+-----+--------------------------------+--------+-----------+------------+
| 1 |     Resistor    |   R   | 1000   | 1.555000  |
+-----+--------------------------------+--------+-----------+------------+
| 3 |     Inductor    |   L   | 110   | 2.750000  |
+-----+--------------------------------+--------+-----------+------------+
| 2 |     Capacitor    |   C   | 4700   | 3.500000  |
+-----+--------------------------------+--------+-----------+------------+
| 4 |     Transistor    |   Q   | 547   | 8.750000  |
+-----+--------------------------------+--------+-----------+------------+

----------This is the end of execution----------
```

CONCLUSION:

In this practical, we learned about various concepts related to structure and structure of arrays. We also successfully implemented a C program for performing various operations on structure like insert, delete, search, sort. Here, we also applied pointers.

REFERENCES:

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E Balgurusamy - Programming in ANSI C, Tata McGraw-Hill (Third Edition)

Yashavant Kanetkar- Let Us C, BPB Publication, 8th Edition.

Continuous Assessment for DS AY 2021-22

RPP (5)	SPO (5)	Total (10)	Signature:

			Assessed By: Mr. V. B. Vaijapurkar
Start date	Submissio n date		Date:
8/11/2021	20/11/2021		Roll. No. 22108
*Regularity, Punctuality, per formance *Submission, Presentation, o als			