

Low:

1. Write a program to display the product details of iPhone in Flipkart by using the following structure

```
struct Phone {  
    int emino;  
    char name[30];  
    char color[30];  
    int modelno;  
};
```

Sample Input and Output:

Enter the emino : 112233  
Enter the name : iPhone  
Enter the colour : Blue  
Enter the model : 8

The Details are  
Emi number : 112233  
Name : iPhone  
Colour : Blue  
Model No : 8

Test case 1

Enter the emino : 112233

Enter the name : iPhone

Enter the colour : Blue

Enter the model : 8

The Details are ↵

Emi·number::112233↵

Name::iPhone↵

Colour::Blue↵

Model·No::8↵

Test case 2

Enter·the·emino::2345

Enter·the·name::Samsung

Enter·the·colour::Red

Enter·the·model::5

The·Details·are↵

Emi·number::2345↵

Name::Samsung↵

Colour::Red↵

Model·No::5

## 2.Problem Solving

Write a program to to read a book details and print them using structures and functions.

Sample Input and Output:

Enter book name : LetUsC

Enter book price : 250

Enter book pages : 320

Name : LetUsC Price : 250.000000 Pages : 320

3. Create a structure called "Student" with members name, age, and total marks. Write a C program to input data for two students, display their information, and find the average of total marks.

Output:

Input details for Student 1:

Name: Climacus

Age: 14

Total Marks: 189

Input details for Student 2:

Name: Meredith

Age: 14

Total Marks: 192

Student 1 Information:

Name: Climacus

Age: 14

Total Marks: 189.00

Student 2 Information:

Name: Meredith

Age: 14

Total Marks: 192.00

Average Total Marks: 190.50

4. Define a structure named Circle to represent a circle with a radius. Write a C program to calculate the area and perimeter of two circles and display the results.

Note:

Function to calculate the area of a circle

Function to calculate the perimeter (circumference) of a circle

5. C to create an array of structures and print the details.

INPUT:

Enter name of student 1: TEST1

Enter age of student 1: 10

Enter name of student 2: TEST2

Enter age of student 2: 20

Enter name of student 3: TEST3

Enter age of student 3: 30

OUTPUT:

Student 1: Name: TEST1, Age: 10

Student 2: Name: TEST2, Age: 20

Student 3: Name: TEST3, Age: 30

6. C to pass a structure to a function and display its members.

INPUT:

Name: John Doe

Age: 20

OUTPUT:

Name: John Doe

Age: 20

7. C to return a structure from a function.

TESTCASE:

Enter name: TEST

Enter age: 20

Name: TEST

Age: 20

8.C to store and print information of multiple employees using structures.(USING ARRAY OF STRUCTURES)

Enter name of employee 1: TEST

Enter ID of employee 1: 2

Enter salary of employee 1: 13. 700

Enter name of employee 2: TEST2

Enter ID of employee 2: 3

Enter salary of employee 2: 12000

Enter name of employee 3: 3 =TEST TEST3

Enter ID of employee 3: 4

Enter salary of employee 3: 30000

Employee 1: Name: TEST, ID: 2, Salary: 13700.00

Employee 2: Name: TEST2, ID: 3, Salary: 12000.00

Employee 3: Name: TEST3, ID: 4, Salary: 30000.00

9.C program to demonstrate example of nested structure

Given Structure

```
struct student {  
    char name[30];  
    int rollNo;  
  
}  
  
struct dateOfBirth {  
    int dd;  
    int mm;  
    int yy;  
} DOB; /*created structure variable DOB*/
```

Testcase:

Enter name: Mike

Enter roll number: 101

Enter Date of Birth [DD MM YY] format: 14 03 92

Name : Mike

RollNo : 101

Date of birth : 14/03/92

10.C program to declare, initialize a UNION,  
example of UNION

Give union

```
union pack {  
    char a;  
    int b;  
    double c;  
};
```

testcase:

Occupied size by union pack: 8

Value of a:A

Value of b:10

Value of c:12345.679000

Value of a:A, b:-377957122, c:12345.679000

Medium

1. Write a C program to demonstrate the usage of unions which manages two integer values, x and y

Tasks:

Define a Union: Declare a union named test that includes two members:

x and y

, both of type int.

Main Function: Implement the main() function to perform the following steps:

Prompt the user to input an integer value for

x

Display the current values of

x and y

after setting

x

Prompt the user to input an integer value for

y

Display the updated values of

x and y

after setting y

Output Format: Ensure that the program outputs the values of

x and y

in a clear and understandable format after each input operation as mentioned in the below sample test case.

Sample Test Case:

x: 2

After making x = 2:

x= 2 y= 2

y: 10

After making y = 10:

x= 10 y= 10

test case 1

x: 2

After making x = 2:↵

x= 2 y= 2↵

y: 10

After making y = 10:↵

$x = 10$   $y = 10$

Test case 2

$x = 0$

After making  $x = 0$ :↵

$x = 0$   $y = 0$ ↵

$y = 1$

After making  $y = 1$ :↵

$x = 1$   $y = 1$

## 2. Problem Solving

Find the time taken to bake a cake for a cooking competition. Enter the starting time and ending time. Use the following structure.

```
struct Time {  
    int hours;  
    int minutes;  
    int seconds;  
};
```

Sample Input and Output:

Enter first time in HH:MM:SS : 3:59:59

Enter second time in HH:MM:SS : 4:0:1

Time difference is : 00:00:02

Test case 1

Enter first time in HH:MM:SS : 3:59:59



Enter second time in HH:MM:SS::4:0:1

Time difference is::00:00:02↵

Test case 2

Enter first time in HH:MM:SS::5:20:20

Enter second time in HH:MM:SS::8:20:20

Time difference is::03:00:00↵

Test case 3

Enter first time in HH:MM:SS::3:35:35

Enter second time in HH:MM:SS::5:25:40

Time difference is::01:50:05

3.Create a structure named Book to store book details like title, author, and price. Write a C program to input details for three books, find the most expensive and the lowest priced books, and display their information.

Output:

Input details for Student 1:

Name: Climacus

Age: 14

Total Marks: 189

Input details for Student 2:

Name: Meredith

Age: 14  
Total Marks: 192

Student 1 Information:  
Name: Climacus  
Age: 14  
Total Marks: 189.00

Student 2 Information:  
Name: Meredith  
Age: 14  
Total Marks: 192.00

Average Total Marks: 190.50

4. Create a structure named "Employee" to store employee details such as employee ID, name, and salary. Write a program to input data for three employees, find the highest salary employee, and display their information.

Output:

Input details for Employee 1:  
Employee ID: 123  
Name: Fabiano  
Salary: 2000

Input details for Employee 2:  
Employee ID: 124  
Name: Larisa  
Salary: 2050

Input details for Employee 3:  
Employee ID: 125  
Name: Mneme

Salary: 1990

Employee with the Highest Salary:

Employee ID: 124

Name: Larisa

Salary: 2050.00

5.Design a structure named "Car" to store details like car ID, model, and rental rate per day. Write a C program to input data for three cars, calculate the total rental cost for a specified number of days, and display the results

Output:

Input details for Car 1:

Car ID: 123

Model: AB2012

Rental Rate per Day: 200

Input details for Car 2:

Car ID: 134

Model: XY2013

Rental Rate per Day: 150

Input details for Car 3:

Car ID: 135

Model: JU2012

Rental Rate per Day: 180

Enter the number of rental days: 10

Total Rental Cost for Car 1: 2000.00

Total Rental Cost for Car 2: 1500.00

Total Rental Cost for Car 3: 1800.00

Explanation:

In the exercise above,

## 6.C Program to Add Two Distances (in inch-feet system) using Structures

### Output

Enter 1st distance

Enter feet: 23

Enter inch: 8.6

Enter 2nd distance

Enter feet: 34

Enter inch: 2.4

Sum of distances = 57'-11.0"

7. Use a union to store temperature data. The data can be stored either as Celsius (float) or Fahrenheit (float). Write a program to read and display the temperature based on user input

Choose the temperature scale to input:

1. Celsius

2. Fahrenheit

Enter your choice (1 or 2): 1

Enter temperature in Celsius: 25

Temperature:

Celsius: 25.00°C

Fahrenheit: 77.00°F

8.

Hard

1. Write a C program to compute internal marks of a student for five different subjects using structures and functions.

At the time of execution, the program should print the message on the console as:

Enter regdno :

For example, if the user gives the input as:

Enter regdno : 501

Next, the program should print the following messages one by one on the console as:

Enter 3 internal marks of subject - 1 :

Enter 3 internal marks of subject - 2 :

Enter 3 internal marks of subject - 3 :

Enter 3 internal marks of subject - 4 :

Enter 3 internal marks of subject - 5 :

For example, if the user gives the input as:

Enter 3 internal marks of subject - 1 : 23 25 27

Enter 3 internal marks of subject - 2 : 22 24 28

Enter 3 internal marks of subject - 3 : 28 29 30

Enter 3 internal marks of subject - 4 : 21 22 27

Enter 3 internal marks of subject - 5 : 19 18 22

then the program should print the result as:

Subject - 1 Total marks - 75.00 Average marks - 25.00

Subject - 2 Total marks - 74.00 Average marks - 24.67

Subject - 3 Total marks - 87.00 Average marks - 29.00

Subject - 4 Total marks - 70.00 Average marks - 23.33

Subject - 5 Total marks - 59.00 Average marks - 19.67

Test case 1

Enter regdno :: 501

Enter 3 internal marks of subject--1::23 25 27

Enter 3 internal marks of subject--2::22 24 28

Enter 3 internal marks of subject--3::28 29 30

Enter 3 internal marks of subject--4::21 22 27

Enter 3 internal marks of subject--5::19 18 22

Subject--1·Total·marks--75.00·Average·marks--25.00↵

Subject--2·Total·marks--74.00·Average·marks--24.67↵

Subject--3·Total·marks--87.00·Average·marks--29.00↵

Subject--4·Total·marks--70.00·Average·marks--23.33↵

Subject--5·Total·marks--59.00·Average·marks--19.67

2. Write a C program to store information using structures with DMA.

Sample Input and Output:

Enter number of records : 5

Enter the subject name and marks : Maths 99

Enter the subject name and marks : Science 87

Enter the subject name and marks : English 89

Enter the subject name and marks : Physics 81

Enter the subject name and marks : Computers 91

| Subject | Marks |
|---------|-------|
|---------|-------|

|       |    |
|-------|----|
| Maths | 99 |
|-------|----|

|         |    |
|---------|----|
| Science | 87 |
|---------|----|

English 89

Physics 81

Computers 91

Note: Define the structure and functions in storeInformation1.c.

Test case 1

Enter number of records::5

Enter the subject name and marks::Maths 99

Enter the subject name and marks::Science 87

Enter the subject name and marks::English 89

Enter the subject name and marks::Physics 81

Enter the subject name and marks::Computers 91

Subject→Marks↵

Maths→99

Science→87

English→89

Physics→81

Computers→91

3. Problem Solving

Write a menu driven program to find the area of the following shapes. Use the structures and use PI value as 3.14.

```
struct Rectangle {  
    int length;  
    int breadth;  
    int area;  
};  
struct Circle {  
    int radius;  
    float area;  
};  
struct Triangle {  
    float base;  
    float height;  
    float area;  
};
```

Sample Input and Output:

```
Menu : 1.Rectangle 2.Circle 3.Triangle  
Enter your choice : 1  
Enter the length and breadth : 4 6  
Rectangle area : 24
```

Test case 1

Menu::1.Rectangle·2.Circle·3.Triangle↵

Enter·your·choice::1

Enter·the·length·and·breadth::4 6

Rectangle·area::24↵

Test case 2



Menu::1.Rectangle 2.Circle 3.Triangle↵

Enter your choice::2

Enter the radius::6

Circle area::113.04↵

Test case 3

Menu::1.Rectangle 2.Circle 3.Triangle

Enter your choice::3

Enter the base and height::4.5 6.7

Triangle area::15.07

#### 4. Problem Solving

Create a structure called Student.

```
struct Student {  
    char name[30];  
    char department[20];  
    int yearOfStudy;  
    float cgpa;  
};
```

Write a program to get the details of n students and to display their details, sorted in ascending order based on name.

Input and Output Format:

Refer sample input and output for formatting specification.

All float values are displayed correct to 2 decimal places.

Test case 1

Enter the number of students :: 2

Enter the details of student - 1

Enter name :: Saraswathi

Enter department :: CSE

Enter year of study :: 4

Enter cgpa :: 8.56

Enter the details of student - 2

Enter name :: Ganga

Enter department :: CE

Enter year of study :: 3

Enter cgpa :: 9.6

Details of students

Student :: 1 Name :: Ganga

Department :: CE Year of study :: 3 CGPA :: 9.60

Student::2·Name::Saraswathi

Department::CSE·Year·of·study::4·CGPA::8.56

5.Create a structure named Book to store book details like title, author, and price.  
Write a C program to input details for three books, find the most expensive and the lowest priced books, and display their information.

Output:

Input details for Book 1:

Title: Book-1

Author: Author-1

Price: 100

Input details for Book 2:

Title: Book-2

Author: Author-2

Price: 120

Input details for Book 3:

Title: Book-3

Author: Author-3

Price: 111

Most Expensive Book:

Title: Book-2

Author: Author-2

Price: 120.00

Lowest Priced Book:

Title: Book-1

Author: Author-1

Price: 100.00

6.Store information of n students using structures using Dynamic memory allocation

Output

Enter the number of records: 2

Enter subject and marks:

Science 82

Enter subject and marks:

DSA 73

Displaying Information:

Science 82

DSA 73

7.C Program to Find Largest Number Using Dynamic Memory Allocation

TESTCASE:

Output

Enter the total number of elements: 5

Enter number1: 3.4

Enter number2: 2.4

Enter number3: -5

Enter number4: 24.2

Enter number5: 6.7

Largest number = 24.20

8.C to implement a simple library management system using structures.

1. Add Book

2. Search Book

3. Exit

Enter your choice: 1

Enter title: C

Enter author: BALA

Enter ID: 2

1. Add Book

2. Search Book

3. Exit

Enter your choice: 2

Enter ID to search: 2

Found: Title: C, Author: BALA, ID: 2

1. Add Book

2. Search Book

3. Exit

Enter your choice: 3

9.

Testcase:

Reference sample output:

Enter name of student to update: test

Enter new name: ksr

Enter new age: 20

Student not found

Student 1: Name: John, Age: 20

Student 2: Name: Alice, Age: 19

Student 3: Name: Bob, Age: 21

Testcase-1:

Enter name of student to update: John

Enter new name: ksr

Enter new age: 20

Student not found

Student 1: Name: ksr, Age: 20

Student 2: Name: Alice, Age: 19

Student 3: Name: Bob, Age: 21

10.

Low:Low:

1. Write a program to display the product details of iPhone in Flipkart by using the following structure

```
struct Phone {  
    int emino;  
    char name[30];  
    char color[30];  
    int modelno;  
};
```

Sample Input and Output:

Enter the emino : 112233

Enter the name : iPhone

Enter the colour : Blue

Enter the model : 8

The Details are

Emi number : 112233

Name : iPhone

Colour : Blue

Model No : 8

Test case 1

Enter the emino :: 112233

Enter the name :: iPhone

Enter the colour :: Blue

Enter the model :: 8

The Details are↵

Emi number :: 112233↵

Name :: iPhone↵

Colour :: Blue↵

Model No :: 8↵

Test case 2

Enter the emino :: 2345

Enter the name :: Samsung

Enter the colour :: Red

Enter the model::5

The Details are↵

Emi number::2345↵

Name::Samsung↵

Colour::Red↵

Model No::5

## 2.Problem Solving

Write a program to read a book details and print them using structures and functions.

Sample Input and Output:

Enter book name : LetUsC

Enter book price : 250

Enter book pages : 320

Name : LetUsC Price : 250.000000 Pages : 320

3.Create a structure called "Student" with members name, age, and total marks. Write a C program to input data for two students, display their information, and find the average of total marks.

Output:

Input details for Student 1:

Name: Climacus

Age: 14



Total Marks: 189

Input details for Student 2:

Name: Meredith

Age: 14

Total Marks: 192

Student 1 Information:

Name: Climacus

Age: 14

Total Marks: 189.00

Student 2 Information:

Name: Meredith

Age: 14

Total Marks: 192.00

Average Total Marks: 190.50

4. Define a structure named Circle to represent a circle with a radius. Write a C program to calculate the area and perimeter of two circles and display the results.

Note:

Function to calculate the area of a circle

Function to calculate the perimeter (circumference) of a circle

5. C to create an array of structures and print the details.

INPUT:

Enter name of student 1: TEST1

Enter age of student 1: 10

Enter name of student 2: TEST2

Enter age of student 2: 20

Enter name of student 3: TEST3

Enter age of student 3: 30

OUTPUT:

Student 1: Name: TEST1, Age: 10

Student 2: Name: TEST2, Age: 20

Student 3: Name: TEST3, Age: 30

6.C to pass a structure to a function and display its members.

INPUT:

Name: John Doe

Age: 20

OUTPUT:

Name: John Doe

Age: 20

7.C to return a structure from a function.

TESTCASE:

Enter name: TEST

Enter age: 20

Name: TEST

Age: 20

8.C to store and print information of multiple employees using structures.(USING  
ARRAY OF STRUCTURES)

Enter name of employee 1: TEST

Enter ID of employee 1: 2

Enter salary of employee 1: 13. 700

Enter name of employee 2: TEST2

Enter ID of employee 2: 3

Enter salary of employee 2: 12000

Enter name of employee 3: 3 =TEST TEST3

Enter ID of employee 3: 4

Enter salary of employee 3: 30000

Employee 1: Name: TEST, ID: 2, Salary: 13700.00

Employee 2: Name: TEST2, ID: 3, Salary: 12000.00

Employee 3: Name: TEST3, ID: 4, Salary: 30000.00

9.

Medium

1. Write a C program to demonstrate the usage of unions which manages two integer values, x and y

.Tasks:

Define a Union: Declare a union named test that includes two members:

x and y

,both of type int.

Main Function: Implement the main() function to perform the following steps:

Prompt the user to input an integer value for

x

Display the current values of

x and y

after setting

x

Prompt the user to input an integer value for

y

Display the updated values of

x and y

after setting y

Output Format: Ensure that the program outputs the values of

x and y

in a clear and understandable format after each input operation as mentioned in the below sample test case.

Sample Test Case:

x: 2

After making x = 2:

x= 2 y= 2

y: 10

After making y = 10:

x= 10 y= 10

test case 1

x: 2

After making x = 2:↵

x= 2 y= 2↵

y: 10

After making y = 10:↵

x= 10 y= 10

Test case 2

x: 0

After making x = 0:↵

x= 0 y= 0↵

y: 1

After making y = 1:↵

x= 1 y= 1

2. Problem Solving

Find the time taken to bake a cake for a cooking competition. Enter the starting time and ending time. Use the following structure.

```
struct Time {  
    int hours;  
    int minutes;  
    int seconds;  
};
```

Sample Input and Output:

Enter first time in HH:MM:SS : 3:59:59

Enter second time in HH:MM:SS : 4:0:1

Time difference is : 00:00:02

Test case 1

Enter first time in HH:MM:SS : 3:59:59

Enter second time in HH:MM:SS : 4:0:1

Time difference is : 00:00:02 ↵

Test case 2

Enter first time in HH:MM:SS : 5:20:20

Enter second time in HH:MM:SS : 8:20:20

Time difference is : 03:00:00 ↵

Test case 3

Enter first time in HH:MM:SS : 3:35:35

Enter second time in HH:MM:SS : 5:25:40

Time difference is :: 01:50:05

3. Create a structure named Book to store book details like title, author, and price. Write a C program to input details for three books, find the most expensive and the lowest priced books, and display their information.

Output:

Input details for Student 1:

Name: Climacus

Age: 14

Total Marks: 189

Input details for Student 2:

Name: Meredith

Age: 14

Total Marks: 192

Student 1 Information:

Name: Climacus

Age: 14

Total Marks: 189.00

Student 2 Information:

Name: Meredith

Age: 14

Total Marks: 192.00

Average Total Marks: 190.50

4.Create a structure named "Employee" to store employee details such as employee ID, name, and salary. Write a program to input data for three employees, find the highest salary employee, and display their information.

Output:

Input details for Employee 1:

Employee ID: 123

Name: Fabiano

Salary: 2000

Input details for Employee 2:

Employee ID: 124

Name: Larisa

Salary: 2050

Input details for Employee 3:

Employee ID: 125

Name: Mneme

Salary: 1990

Employee with the Highest Salary:

Employee ID: 124

Name: Larisa

Salary: 2050.00

5.Design a structure named "Car" to store details like car ID, model, and rental rate per day. Write a C program to input data for three cars, calculate the total rental cost for a specified number of days, and display the results

Output:

Input details for Car 1:

Car ID: 123

Model: AB2012

Rental Rate per Day: 200

Input details for Car 2:

Car ID: 134

Model: XY2013

Rental Rate per Day: 150

Input details for Car 3:

Car ID: 135

Model: JU2012

Rental Rate per Day: 180

Enter the number of rental days: 10

Total Rental Cost for Car 1: 2000.00

Total Rental Cost for Car 2: 1500.00

Total Rental Cost for Car 3: 1800.00

Explanation:

In the exercise above,

6.C Program to Add Two Distances (in inch-feet system) using Structures

Output

Enter 1st distance

Enter feet: 23

Enter inch: 8.6

Enter 2nd distance

Enter feet: 34

Enter inch: 2.4



Sum of distances = 57'-11.0"

7.Explain how the union helps manage multiple traffic light states in the program.  
How does it handle state transitions from one light to another

--- Traffic Light Control System ---

1. Set light to RED
2. Set light to YELLOW
3. Set light to GREEN
4. Exit

Enter your choice: 1

Traffic Light State:

Color: R

Duration: 30 seconds

Description: Stop

--- Traffic Light Control System ---

1. Set light to RED
2. Set light to YELLOW
3. Set light to GREEN
4. Exit

Enter your choice: 3

Traffic Light State:

Color: G

Duration: 25 seconds

Description: Go

--- Traffic Light Control System ---

1. Set light to RED
2. Set light to YELLOW
3. Set light to GREEN
4. Exit

Enter your choice: 4  
Exiting program. Goodbye!

Hard

1. Write a C program to compute internal marks of a student for five different subjects using structures and functions.

At the time of execution, the program should print the message on the console as:  
Enter regdno :

For example, if the user gives the input as:  
Enter regdno : 501

Next, the program should print the following messages one by one on the console as:

Enter 3 internal marks of subject - 1 :  
Enter 3 internal marks of subject - 2 :  
Enter 3 internal marks of subject - 3 :  
Enter 3 internal marks of subject - 4 :  
Enter 3 internal marks of subject - 5 :

For example, if the user gives the input as:

Enter 3 internal marks of subject - 1 : 23 25 27  
Enter 3 internal marks of subject - 2 : 22 24 28  
Enter 3 internal marks of subject - 3 : 28 29 30  
Enter 3 internal marks of subject - 4 : 21 22 27  
Enter 3 internal marks of subject - 5 : 19 18 22

then the program should print the result as:

Subject - 1 Total marks - 75.00 Average marks - 25.00  
Subject - 2 Total marks - 74.00 Average marks - 24.67  
Subject - 3 Total marks - 87.00 Average marks - 29.00

Subject - 4 Total marks - 70.00 Average marks - 23.33  
Subject - 5 Total marks - 59.00 Average marks - 19.67

Test case 1

Enter regdno : 501

Enter 3 internal marks of subject - 1 : 23 25 27

Enter 3 internal marks of subject - 2 : 22 24 28

Enter 3 internal marks of subject - 3 : 28 29 30

Enter 3 internal marks of subject - 4 : 21 22 27

Enter 3 internal marks of subject - 5 : 19 18 22

Subject - 1 Total marks - 75.00 Average marks - 25.00↵

Subject - 2 Total marks - 74.00 Average marks - 24.67↵

Subject - 3 Total marks - 87.00 Average marks - 29.00↵

Subject - 4 Total marks - 70.00 Average marks - 23.33↵

Subject - 5 Total marks - 59.00 Average marks - 19.67

2. Write a C program to store information using structures with DMA.

Sample Input and Output:

Enter number of records : 5

Enter the subject name and marks : Maths 99

Enter the subject name and marks : Science 87

Enter the subject name and marks : English 89

Enter the subject name and marks : Physics 81

Enter the subject name and marks : Computers 91

| Subject | Marks |
|---------|-------|
|---------|-------|

|       |    |
|-------|----|
| Maths | 99 |
|-------|----|

|         |    |
|---------|----|
| Science | 87 |
|---------|----|

|         |    |
|---------|----|
| English | 89 |
|---------|----|

|         |    |
|---------|----|
| Physics | 81 |
|---------|----|

|           |    |
|-----------|----|
| Computers | 91 |
|-----------|----|

Note: Define the structure and functions in storeInformation1.c.

Test case 1

Enter number of records :: 5

Enter the subject name and marks :: Maths 99

Enter the subject name and marks :: Science 87

Enter the subject name and marks :: English 89

Enter the subject name and marks :: Physics 81

Enter the subject name and marks :: Computers 91

Subject→Marks↵

Maths→99

Science→87

English→89

Physics→81

Computers→91

### 3. Problem Solving

Write a menu driven program to find the area of the following shapes. Use the structures and use PI value as 3.14.

```
struct Rectangle {  
    int length;  
    int breadth;  
    int area;  
};  
struct Circle {  
    int radius;  
    float area;  
};  
struct Triangle {  
    float base;  
    float height;  
    float area;  
};
```

Sample Input and Output:

```
Menu : 1.Rectangle 2.Circle 3.Triangle  
Enter your choice : 1  
Enter the length and breadth : 4 6  
Rectangle area : 24
```

Test case 1

Menu::1.Rectangle·2.Circle·3.Triangle↵

Enter your choice::1

Enter the length and breadth::4 6

Rectangle area::24↵

Test case 2

Menu::1.Rectangle 2.Circle 3.Triangle↵

Enter your choice::2

Enter the radius::6

Circle area::113.04↵

Test case 3

Menu::1.Rectangle 2.Circle 3.Triangle

Enter your choice::3

Enter the base and height::4.5 6.7

Triangle area::15.07

#### 4. Problem Solving

Create a structure called Student.

```
struct Student {
```

```
    char name[30];  
    char department[20];  
    int yearOfStudy;  
    float cgpa;  
};
```

Write a program to get the details of n students and to display their details, sorted in ascending order based on name.

Input and Output Format:

Refer sample input and output for formatting specification.

All float values are displayed correct to 2 decimal places.

Test case 1

Enter the number of students :: 2

Enter the details of student - 1

Enter name :: Saraswathi

Enter department :: CSE

Enter year of study :: 4

Enter cgpa :: 8.56

Enter the details of student - 2

Enter name :: Ganga

Enter department :: CE

Enter year of study :: 3

Enter cgpa :: 9.6

Details of students

Student::1 Name::Ganga

Department::CE Year of study::3 CGPA::9.60

Student::2 Name::Saraswathi

Department::CSE Year of study::4 CGPA::8.56

5.Create a structure named Book to store book details like title, author, and price.  
Write a C program to input details for three books, find the most expensive and the lowest priced books, and display their information.

Output:

Input details for Book 1:

Title: Book-1

Author: Author-1

Price: 100

Input details for Book 2:

Title: Book-2

Author: Author-2

Price: 120

Input details for Book 3:

Title: Book-3

Author: Author-3

Price: 111

Most Expensive Book:

Title: Book-2

Author: Author-2

Price: 120.00



Lowest Priced Book:

Title: Book-1

Author: Author-1

Price: 100.00

6.Store information of n students using structures using Dynamic memory allocation

Output

Enter the number of records: 2

Enter subject and marks:

Science 82

Enter subject and marks:

DSA 73

Displaying Information:

Science 82

DSA 73

7.C Program to Find Largest Number Using Dynamic Memory Allocation

TESTCASE:

Output

Enter the total number of elements: 5

Enter number1: 3.4

Enter number2: 2.4

Enter number3: -5

Enter number4: 24.2

Enter number5: 6.7

Largest number = 24.20

8.C to implement a simple library management system using structures.

1. Add Book

2. Search Book

3. Exit

Enter your choice: 1

Enter title: C

Enter author: BALA

Enter ID: 2

1. Add Book

2. Search Book

3. Exit

Enter your choice: 2

Enter ID to search: 2

Found: Title: C, Author: BALA, ID: 2

1. Add Book

2. Search Book

3. Exit

Enter your choice: 3

9.write c program to update name using structure

Testcase:

Reference sample output:

Enter name of student to update: test

Enter new name: ksr

Enter new age: 20

Student not found

Student 1: Name: John, Age: 20

Student 2: Name: Alice, Age: 19

Student 3: Name: Bob, Age: 21

Testcase-1:

Enter name of student to update: John

Enter new name: ksr

Enter new age: 20

Student not found

Student 1: Name: ksr, Age: 20

Student 2: Name: Alice, Age: 19

Student 3: Name: Bob, Age: 21

10. Write a program to dynamically allocate memory for a structure containing a name (string) and age. Use malloc to allocate memory for the string and display the data after accepting it from the user. give answer

testcase:

Enter the length of the name: 10

Enter the name: John Doe

Enter the age: 25

--- Person Details ---

Name: John Doe

Age: 25

