

## Exercises:

1. Create a structure to specify data on students given below:

Roll number, Name, Department, Course, Year of joining Assume that there are not more than 450 students in the college.

- Print names of all students who joined in a particular year.
- Print the data of a student whose roll number is given.

2. An automobile company has a serial number for engine parts starting from AA0 to FF9. The other characteristics of parts to be specified in a structure are: Year of manufacture, material and quantity manufactured.

- Specify a structure to store information corresponding to a part.
- Write a program to retrieve information on parts with serial numbers between BB1 and CC6.

3. Write a program to compare two dates entered by the user. Make a structure named Date to store the elements day, month and year to store the dates. If the dates are equal, display "Dates are equal" otherwise display "Dates are not equal".

4. Write a structure to store the names, salary and hours of work per day of 10 employees in a company. Write a program to increase the salary depending on the number of hours of work per day as follows and then print the name of all the employees along with their final salaries.

- Hours of work per day      8      10       $\geq 12$
- Increase in salary      \$50      \$100      \$150

5. Consider there are two structures: Employee (dependent structure) and another structure called Organization (Outer structure). The structure Organization has the data members like organisation\_name, organisation\_number. The Employee structure is nested inside the structure Organization and it has the data members like employee\_id, name, salary.

```
org.emp.employee_id;  
org.emp.name;  
org.emp.salary;
```

```
org.organisation_name;  
org.organisation_number;
```

*Here, org is the structure variable of the outer structure Organisation and emp is the structure variable of the inner structure Employee.*

Output the following data using above structure

```
The size of structure organisation : 123  
Organisation Name : NU-Fast  
Organisation Number : NUFast123ABC
```

*Employee id : 127*

*Employee name : Linus Sebastian*

*Employee Salary : 400000*

6. Create a structure named Date having day, month and year as its elements. Store the current date in the structure. Now add 45 days to the current date and display the final date.

7. Let us work on the menu of a library. Create a structure containing book information like accession number, name of author, book title and flag to know whether book is issued or not.

Create a menu in which the following can be done.

1 - Display book information

2 - Add a new book

3 - Display all the books in the library of a particular author

4 - Display the number of books of a particular title

5 - Display the total number of books in the library

6 - Issue a book

(If we issue a book, then its number gets decreased by 1 and if we add a book, its number gets increased by 1)

8. You are transporting some boxes through a tunnel, where each box is a parallelepiped, and is characterized by its length, width and height.

The height of the tunnel is 41 feet, and the width can be assumed to be infinite. A box can be carried through the tunnel only if its height is strictly less than the tunnel's height. Find the volume of each box that can be successfully transported to the other end of the tunnel. Note: Boxes cannot be rotated.

#### **Sample Input 0**

```
4
5 5 5
1 2 40
10 5 41
7 2 42
```

#### **Sample Output 0**

```
125
80
```

Explanation: The first box is low, only 5 feet tall, so it can pass through the tunnel and its volume is  $5*5*5=125$ . The second box is sufficiently low, its volume is  $1*2*40=80$ . The third box is exactly 41 feet tall so it cannot pass. The same can be said about the fourth box.

Note: Only use structs for this question

9. You need to implement the following 2 struct.

```
struct Student{}; struct Register{};
```

Student contains attributes StudentId, FirstName, LastName, cellNo, email.

Register contains the attributes CourseId, CourseName.

Now you need to inherit the Register struct in Student struct. It means that the student struct holds the variable of Register struct variable. After that you need to take input for 5 students and then print them

[Hint: Declare array of struct Student std[5]; for 5 students ]