Lab 9 : Structure and union

1. You are now asked to extend the before assignment program by storing student's rollno, name along with their marks of six subjects for which you created a structure of five students as follows:

```
struct student
{
int rollno;
char *name;
int sub-marks[6];
}s[5];
```

Do the followings on the above structure.

i) Display all the student details by passing the structure to a function.
ii) Find the total mark obtained by each student in all the six subjects.
iii) Print the details of the student who got highest and who got lowest marks.

2. Instead of a *structure*, now you are asked to create a *union* that stores a student's rollno, mark for one subject and his name. WAP to create such *union* and read a student details, and finally print it on the screen. [Hint: Remember *union* in C, shares the same memory location for all the members and it occupies maximum memory whose size is equal to the memory occupied by the largest member

1. Define a data type for storing complex number and implement addition, subtraction, multiplication and modulus operations for the defined data type.
2. Create a structure to specify data of customers in a bank. The data to be stored is:
   Account number, Name, Balance in account.
   i. Write a function to print the Account number and name of each customer with balance below Rs. 100
   ii. If a customer requests for withdrawal or deposit, it is given in the form:
   Account Number, Amount, Code (1 for deposit, 0 for withdrawal)
   If on withdrawal the balance falls below Rs. 100 then program give a message " Insufficient Balance".
3. Develop a phonebook application. It should be able to store, modify and list entries present in the phonebook. A phone book entry consists of the name of the person and his contact information. The name of the person consists of his first name and family name. The contact information consists of the landline number and the mobile number of the person.
4. Create a structure Employee1 that holds the information- Id (integer), Name (character []), Salary (long).Create a union Employee2 that also holds the same information as well as same data type as that of structure Employee1. Write a program in C to find and display the size of structure Employee1 and union Employee2.
5. Create a structure called Library to hold accession number, title of the book, author name, price of the book and flag indicating whether book is issued or not. Write a menu driven program that implements the working of a library. The menu options should be:
   i. Add book information
   ii. Display book information
   iii. List the count of books in a library
   iv. List all books of given author
   v. Exit

Assignment

1. Define a structure data type called DATE for storing dates. The type contains three integer members: day, month and year. Implement the following operations for the defined data type:
    i) Isvalid: Check whether the entered date is valid or not, e.g. 31-2-2018 is not valid date since February does not have 31 days.
    ii) Nextdate: Finds the next date e.g. if the current date is 31-1-2018, then the result of Nextdate operation is 1-2-2018.
    iii) Datediff: Finds the difference between two dates.
2. Define structure data type TRAIN_INFO. The type contains:
    i. Train No: interger type
    ii. Train name: string
    iii. Departure time: aggregate type TIME
    iv. Arrival time: aggregate type TIME
    v. Start station: string
    vi. End station: string

The structure type TIME contains two integer members: hours and minute. Maintain a train timetable and implement the following operations:

i) List all the trains (sorted according to train number) that depart from particular station.
ii) List all the trains that depart from a particular station at particular point.
iii) List all the trains that depart from a particular station within next one hour of a given time.
iv) List all the trains between a pair of start station and end station.