Array of Structures

1. Define a structure named **Student** having members ***name***, ***rollno*** and ***marks in 5 subjects***. WAP to read record of 10 students. Calculate total marks and percentage of each student and print them.

2. Define a structure name **Employee** having its member ***empid***, ***name***, ***address***, and ***salary***. WAP to read record of 10 employees and

   (a) Display record of all employees who live in '***DHARAN***'.
   (b) Display record of all employees who does not live in '***DHARAN***'.
   (c) Display record of all employees whose salary ranges between ***15000*** to ***20000***.
   (d) Display record of all employees after increasing the salaries of all employees by ***10***%.
   (e) Increase the salary by 10% of only those employees who lives in '***BIRATNAGAR***' . Display record of all employees.

3. Define a structure:
   Name(***fname***, ***mname***, ***lastname***)
   Person(***age***, ***contact***, ***address***)
   WAP to nest the structure **Name** within structure **Person** and read the record of 10 persons and display it.

4. Define a structure name **Complex** with its member ***real*** and ***img***. Write a user defined function named ***addComplex()*** to add two given **Complex** numbers. The function should take two **Complex** type arguments and also return C**omplex** type. WAP to implement the UDF in main program.

5. Define a structure name **Time** with its member ***hr, min*** and ***sec***. Write a user defined function named ***timeDiff***() to calculate the difference between two time periods. The function should take two **Time** type arguments and also return **Time** type. WAP to implement the UDF in main program.

6. Define a structure named **Student** having members ***name*** *and* ***rollno***. WAP to read record of 10 students. Sort the students record in ascending order according to their roll numbers.

1).

a).

```
#include<stdio.h>
struct employee
{
   int empid ,salary;
   char name[10],address[10];
};
int main()
{
   int n,i;
   printf("enter a number of people lives in dharan :");
   scanf("%d",&n);
   struct employee s1[n];
   for(i=0;i<n;i++)
```

```
    {
       printf("enter a employee id :");
       scanf("%d",&s1[i].empid);
       printf("enter a employee name  :");
       scanf("%s",s1[i].name);
       printf("entera a employee address :");
       scanf("%s",s1[i].address);
       printf("enter a employee salary :");
       scanf("%d",&s1[i].salary);
       printf("the employee id is :%d\n",s1[i].empid);
       printf("the employee name is :%s\n",s1[i].name);
       printf("the employee address is :%s\n",s1[i].address);
       printf("the employee salary is :%d\n",s1[i].salary);
    }
    return 0;
}
```

b).

```
#include<stdio.h>
struct employee
{
   int empid ,salary;
   char name[10],address[10];
};
int main()
{
   int n,i;
   printf("enter a number of people who does not  lives in dharan :");
   scanf("%d",&n);
   struct employee s1[n];
   for(i=0;i<n;i++)

   {
      printf("enter a employee id :");
      scanf("%d",&s1[i].empid);
      printf("enter a employee name  :");
      scanf("%s",s1[i].name);
      printf("entera a employee address :");
      scanf("%s",s1[i].address);
      printf("enter a employee salary :");
      scanf("%d",&s1[i].salary);
      printf("the employee id is :%d\n",s1[i].empid);
      printf("the employee name is :%s\n",s1[i].name);
      printf("the employee address is :%s\n",s1[i].address);
```

```
        printf("the employee salary is :%d\n",s1[i].salary);
    }
    return 0;
}
```

c).

```
#include<stdio.h>
struct employee
{
    int empid ,salary;
    char name[10],address[10];
};
int main()
{
    int n,i;
    printf("enter a number of Employee who  lives in dharan :");
    scanf("%d",&n);
    struct employee s1[n];
    for(i=0;i<n;i++)

    {
        printf("EMPLOYEE %d\n",i+1);
        printf("Enter a Employee id :");
        scanf("%d",&s1[i].empid);
        printf("Enter a Employee name  :");
        scanf("%s",s1[i].name);
        printf("Entera a Employee address :");
        scanf("%s",s1[i].address);
        printf("Enter a Employee salary :");
        scanf("%d",&s1[i].salary);
    }
        printf("\n Name ranges between 15000-20000\n");
        printf("Emp id \t Emp name \tEmp address \t Emp salary\n");
        for(i=0;i<n;i++)
        {if(s1[i].salary>=15000 && s1[i].salary<=20000 )
        {
            printf("%d \t %s \t \t%s \t\t %d \t\n",s1[i].empid,s1[i].name,s1[i].address,s1[i].salary);
        }
        }
    return 0;
}
```

d).

```
#include<stdio.h>
```

```
struct employee
{
   int empid ,salary;
   char name[10],address[10];
};
int main()
{
   int n,i,percent;
   printf("enter a number of Employee who  lives in dharan :");
   scanf("%d",&n);
   struct employee s1[n];
   for(i=0;i<n;i++)

   {
      printf("EMPLOYEE %d\n",i+1);
      printf("Enter a Employee id :");
      scanf("%d",&s1[i].empid);
      printf("Enter a Employee name  :");
      scanf("%s",s1[i].name);
      printf("Entera a Employee address :");
      scanf("%s",s1[i].address);
      printf("Enter a Employee salary :");
      scanf("%d",&s1[i].salary);
   }
     printf("by increasing salary by 10%%\n ");

      printf("Emp Id\t\tEmp name\tEmp Address\t Emp salary\n");
      for(i=0;i<n;i++)
      {
         percent=(float)(0.1)*s1[i].salary+s1[i].salary;
         printf("%d\t\t%s\t\t%s\t\t%d\t\n",s1[i].empid,s1[i].name,s1[i].address,percent);
      }

   return 0;
}
```

e).

```
#include<stdio.h>
struct employee
{
   int empid ,salary;
   char name[10],address[10];
};
int main()
{
```

```
   int n,i,percent;
   printf("enter a number of Employee who  lives in dharan :");
   scanf("%d",&n);
   struct employee s1[n];
   for(i=0;i<n;i++)

   {
      printf("EMPLOYEE %d\n",i+1);
      printf("Enter a Employee id :");
      scanf("%d",&s1[i].empid);
      printf("Enter a Employee name  :");
      scanf("%s",s1[i].name);
      printf("Entera a Employee address :");
      scanf("%s",s1[i].address);
      printf("Enter a Employee salary :");
      scanf("%d",&s1[i].salary);
   }
     printf("by increasing salary by 10%%\n ");

      printf("Emp Id\t\tEmp name\tEmp Address\t Emp salary\n");
      if(s1[i].address =='biratnagar')
     { for(i=0;i<n;i++)
      {
         percent=(float)(0.1)*s1[i].salary+s1[i].salary;
         printf("%d\t\t%s\t\t%s\t\t%d\t\n",s1[i].empid,s1[i].name,s1[i].address,percent);
      }}
      else
         { for(i=0;i<n;i++)
      {
         printf("%d\t\t%s\t\t%s\t\t%d\t\n",s1[i].empid,s1[i].name,s1[i].address,s1[i].salary);
      }}

   return 0;
}
```

2).

```
#include<stdio.h>
struct student
{
   char name[10];
   int rollno,mark,k;

};
int main()
```

```
{
   struct student s1[10];
   int total=500;
   float z;
   int i,k=0;
   printf("enter a detail fot 10 student\n");
   for(i=0;i<10;i++)
   {
   printf("enter a name of  %d student :",i+1);
   scanf("%s",s1[i].name);
   printf("enter a roll no %d student :",i+1);
   scanf("%d",&s1[i].rollno);
   int j;
   for(j=0;j<5;j++)
   {
    printf("enter a mask in %d subject :",j+1);
    scanf("%d",&s1[j].mark);

   }
   printf("the name of student is :%s  \n",s1[i].name);
   printf("the roll no of student is :%d  \n",s1[i].rollno);
   for(j=0;j<5;j++)
   {
       k+=s1[j].mark;
   }
      printf("the total mask otained is %d\n",k);
       z=(float)k/total * 100;
      printf("percent  = %.2f%%\n",z);
      k-=k;
   }
   return 0;

}
```

3).

```
 #include<stdio.h>
   struct name

   {
      char fname[10],mname[10],lastname[10];
   };
     struct person
   {
      int age ,contact;
```

```
    char add[10];
  };

int main()
{
  struct person s1[3];
  struct name s2[3];
  int i;
  for(i=0;i<2;i++)
  {
    printf("Person %d\n\n",i+1 );
    printf("Enter a first name : ");
    scanf("%s",s2[i].fname);
    printf("Enter a middle name : ");
    scanf("%s",s2[i].mname);
    printf("Enter a last name : ");
    scanf("%s",s2[i].lastname);
    printf("enter a person age :");
    scanf("%d",&s1[i].age);
    printf("enter a person contact :");
    scanf("%d",&s1[10].contact);
    printf("enter a person address :");
    scanf("%s",s1[i].add);

  }
  for(i=0;i<2;i++)
 { printf("The Name of Person is : %s %s %s\n",s2[i].fname,s2[i].mname,s2[i].lastname);
    printf("the person   age   is :%d\n",s1[i].age);
    printf("the person contact is :%d\n",s1[i].contact);
    printf("the person contact is :%s\n",s1[i].add);

 }


return 0;
}
```

4)

```
#include<stdio.h>
typedef struct time
{
  int hr,min,sec;
}time;
time timediff(time,time);
```

```
int main()
{
   int i;
  struct time t1,t2,t3;
 { printf("enter a hour :");
  scanf("%d",&t1.hr);
  printf("enter a first minute : ");
  scanf("%d",&t1.min);
  printf("enter a second :");
  scanf("%d",&t1.sec);
  printf("enter a 2nd hour :");
  scanf("%d",&t2.hr);
  printf("enter a 2nd minute :");
  scanf("%d",&t2.min);
  printf("enter a 2nd second :");
  scanf("%d",&t2.sec);
  t3=timediff(t1,t2);
  printf("\nthe final hour is %d:%d:%d -",t3.hr,t3.min,t3.sec);
  return 0;
  }
}
  time timediff(time x,time y)
  {
     time z;
  z.hr=x.hr-y.hr;
  z.min =x.min -y.min;
  z.sec=x.sec - y.sec;
  return z;
  }
```

5).

```
 #include<stdio.h>
struct student
{
   int rollno;
   char name[5];
};
int main()
{
   struct student p[4],q[4],temp;
   int i,j;
   for(i=0;i<4;i++)
   {printf("enter a %d student name :",i+1);
   scanf("%s",p[i].name);
```

```
    printf("entera a %d roll no :",i+1);
    scanf("%d",&p[i].rollno);
    }


    for(i=0;i<4;i++)
    {
       q[i]=p[i];
       for(j=i;j<4;j++)
       {
          if(q[i].rollno > p[j].rollno)
          {
             temp=p[i];
             p[i]=p [j];
             p[j]=temp;
          }
       }
    }
    printf("the student in asceding order are  \n");
    for(i=0;i<4;i++)
    {
       printf(" %d - %s\n ",p[i].rollno,p[i].name);
    }
    return 0;

}
```