Assignment 9

Q1. Create a structure for student/employee information with suitable members and do the following
- Creating variables, input, output operations
- initialization(complete or partial) of variables
- create a pointer of struct type, and assign address of variable
- access members from the pointer using arrow operator
- calculate size of variable, offset of each member
- create alias for the structure type, pointer type using typedef

Q2. Given the address of a member variable in a structure find the base address of it.
For eg:- struct A {
```
        int x;
        double y;
        float z;
        char ch;
}a1;
```
given address of any member x,y,z or ch , find address(base) of a1.

Q3. In the student structure created above modify marks member as an array(array of 5 subjects), create an array of struct variables and do some input,output operations.(Marks of ith student in jth subject etc).Find the student wise totals, subject wise totals.

Q4. Create an employee structure with the following members empid, employee name, salary, year of joining etc.
Accept the data for certain no. of employees and find their total, average, max, min salary.
Also find out the employees with maximum, minimum service,use a function to find service for each employee element in the array.

Q5. Whats wrong in the following code, suggest a fix for this.
```
struct A
{
        int x;
        char *str; // (or) char str[20];
};
struct A a1 = { 101, “abc” } , a2;
a1.x=10;
a1.str=”hello”; //works?
scanf(“%d%s”,&a1.x,a1.str); //works?
a2 = a1; //shallow copy or deep copy?
```

What if str is declared as an array instead of pointer, i.e. char

str[20]

Q6. Create an anonymous structure, create some variables from this (with & without typedef)

Q7. Create a nested structure, access members of inner structure from outer one.

Q8. Try the following code

```
union A
{
        int x;
        int y;
        char ch;
};
union A a1;
a1.x=0x10;       a1.y=0x1121;    print a1.x, a1.ch
```

Calculate size of union , offset of each member

Q9. Analyse the following code

```
union A
{
        int x;
        float y;
        double z;
        int arr[2];
}a1;
a1.y=6.25f;
printf("x=%x\n",a1.x);
a1.z=0.15625;;
printf("%x%x\n",a1.arr[1],a1.arr[0]);


union B
{
        int x;
        short int y;
        char ch;
        char carr[4];
}b1;
b1.x=0x41424344;
```

Analyse the values of b1.y, b1.ch, print all elements of b1.carr
Modify b1.y or b1.ch and check the value of b1.x

Q10. Try out nesting of structures, unions
(a) Union inside a structure
(b) Structure/Structures inside an union
(c) Union inside another union etc.