Data Structures

Structures

What is a Structure:

- A structure is a user defined data type which is a collection of variables of different data types under a single name.
- It becomes clumsy declaring different datatypes.
- Structures made easy.
- Represent Date
  - Day
  - Month
  - Year
- Used to store details or records of students.

Declaration of a Structure:

- Struct is the keyword for declaring of a structure.

```
struct nameof_tag {
   data type member1;
   data type member2;//you can declare as many member as you want
};
struct nameof_tag {
   data type member1;
   data type member2;//you can declare as many member as you want
}variable name;//Global variable
```

- If you declare structure in this method you should use keyword struct when creating a struct variable .

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

int main() {
    int day,year;
    char month[50];
    day=12;
    strcpy(month,"june");
    year=1999;
    printf("%d %s %d",day,month,year);
    return 0;
}
```

12 june 1999

```c
//declaring structure

struct date{
    int day;
    char month[50];
    int year;
};
int main() {
    struct date d1,d2;//creating structure variable
    d1.day=12;
    strcpy(d1.month,"june");
    d1.year=1999;
    printf("%d %s %d",d1.day,d1.month,d1.year);//Acessing
structures
    return 0;
}
```

12 june 1999

- When you use typedef it is not necessary to use keyword struct when creating a structure variable.

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

//declaring structure
typedef struct date{
    int day;
    char month[50];
    int year;
}date;
int main() {
    date d1,d2;//creating structure variable
    d1.day=12;
    strcpy(d1.month,"june");
    d1.year=1999;
    printf("%d %s %d",d1.day,d1.month,d1.year);//Acessing structures
    return 0;
}
```

Structure with in a structure:

```c
typedef struct date{//declaring structure
    int day;
    char month[50];
    int year;
}date;
typedef struct student{
    int rollno;
    char name[50];
    struct date  dob; //structure within a structure
}student;

int main() {
    int i=0;
    date d1;
    student s1[100],s2[100];
    while(i<5) {
        s1[i].rollno=94;
        strcpy(s1[i].name,"surya");
        s1[i].dob.day=30;
        strcpy(s1[i].dob.month,"June");
        s1[i].dob.year=1999;
        printf("%d %s %d %s
%d\n",s1[i].rollno,s1[i].name,s1[i].dob.day,s1[i].dob.month,s1[i].dob.year);
        i++;
    }
    return 0;
}
```

Pointers to structures:

- for accessing pointer to structure we must use “->” this symbol instead of dot(.)

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

//declaring structure
typedef struct date{
    int day;
    char month[50];
    int year;
}date;

void printdetails(date *details){//pointer to structure
    printf("%d %s %d",details->day,details->month,details->year);//Acessing
structures
}
int main() {
    date d1,d2;//creating structure variable
    d1.day=12;
    strcpy(d1.month,"june");
    d1.year=1999;
    printdetails(&d1);
    return 0;
}
```