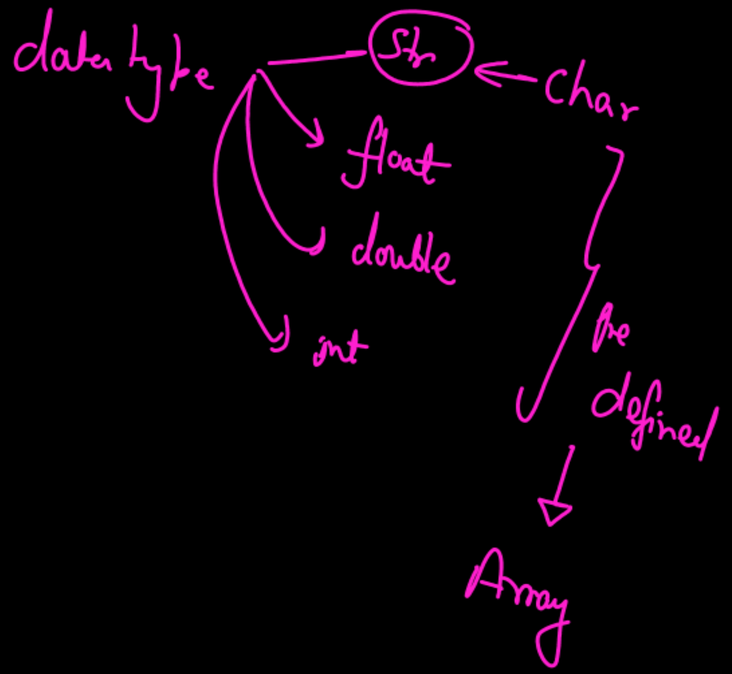
LECTURE - 39

STRUCTURES IN C

'C' PROGRAMMING

Limitations of Array : Homogeneous type



Control

Students → A → Name
B → Marks
C → date of Birth
D → attendance
} Arrays

new

Datatype ← Student ← String
float
int
float

Variable

int x = 10

Student x = { "Ajay", 75.0, 22022010, 97 }

Structures :

↳ A Structure is a User-defined datatype that allows grouping different types of variables under one name.

Programmer

↳ Datatype

* 'Struct' Keyword is used to create a Structure.

→ Members can be different (int, float, char, pointer, double, String etc)

Syntax:

```
Struct StructureName {
    datatype member 1;
    datatype member 2;
    :
};
```

Semicolon

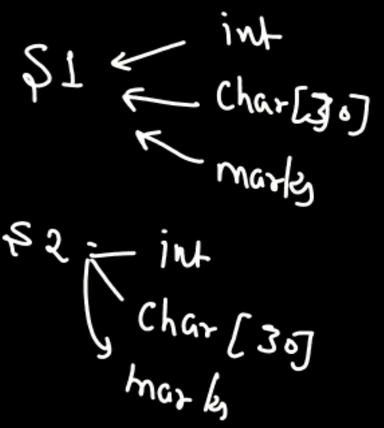
Members to the Structure

Semicolon

declaration of Structure:

```
Struct   StructureName   VariableName1, VariableName2 ;
```

Identify → Struct
datatype → StructureName
Identifier → VariableName1, VariableName2



Example:

```
Struct Student {
        int RollNo ;
        char name[30] ;
        float marks ;
};
```

datatype → Struct Student
Variables → S1, S2

```
Struct Student S1, S2 ;
```

* To access the members of S1 & S2 we use dot (.) operator.

```
S1.RollNo = 1 ;
S1.name = "Aditi" ;
strcpy(S1.name, "Aditi");
S1.marks = 97 ;

S2.RollNo = 2 ;                S2.marks = 75 ;
strcpy(S2.name, "Ankit");
```

Printing the values of members of a structure :

```
printf ("%d", S1.RollNo);  → 1
printf ("%d", S2.RollNo);  → 2
printf ("%s", S1.name);    → Aditi
printf ("%f", S1.marks);   → 97
```

Welcome | structures.c ●

structures.c > main()

```c
#include<stdio.h>
#include <string.h>
struct student{
    int rollNum;
    char name[30];
    float marks;
};
int main(){
    struct student x;
    x.rollNum = 10;
    strcpy(x.name, "Raju");
    x.marks = 55.0;
    printf("%d\n", x); // address of variable garbage value
    printf("%f\n", x.marks);
    printf("%s\n", x.name);
    struct student y;
    y.rollNum = 15;
    strcpy(y.name,"Ritika");
    y.marks = 85.0;
    printf("The sum of Raju and Ritika's marks are: %f", x.
    marks + y.marks);
    return 0;
}
```

Code

```
6421920
55.000000
Raju
The sum of Raju and Ritika's marks are
: 140.000000
PS>
```

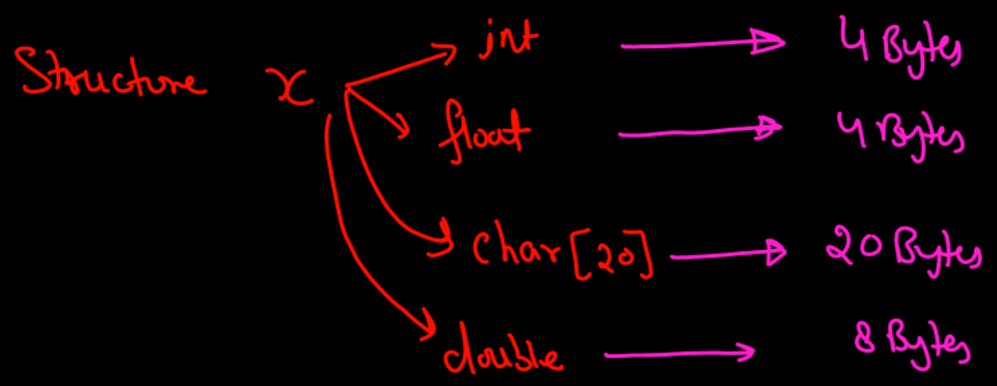
int → 4 Bytes

float → 4 Bytes

double → 8 Bytes

Char → 1 Byte

Structure → Size of all number of members.



* The Size of Structure is dependent on the number of elements & their Size.

printf ("%d", sizeof (x)) ← Less Memory Efficient