SNS COLLEGE OF ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE NAME : 23CST101 C PROGRAMMING AND DATA STRUCTURES

I YEAR / II SEMESTER

Unit 2- **C PROGRAMMING ADVANCED FEATURES**

Topic 1: Introduction to structures

Brain Storming

1. How to handle mixed datatype effectively?

What is structure?

- Structure in c is a user-defined data type that enables us to store the collection of different data types.

- Each element of a structure is called a member.

- Keyword: **struct**

Syntax

```
struct structure_name

{

    data_type member1;

    data_type member2;

    .

    .

    data_type memeberN;

};
```
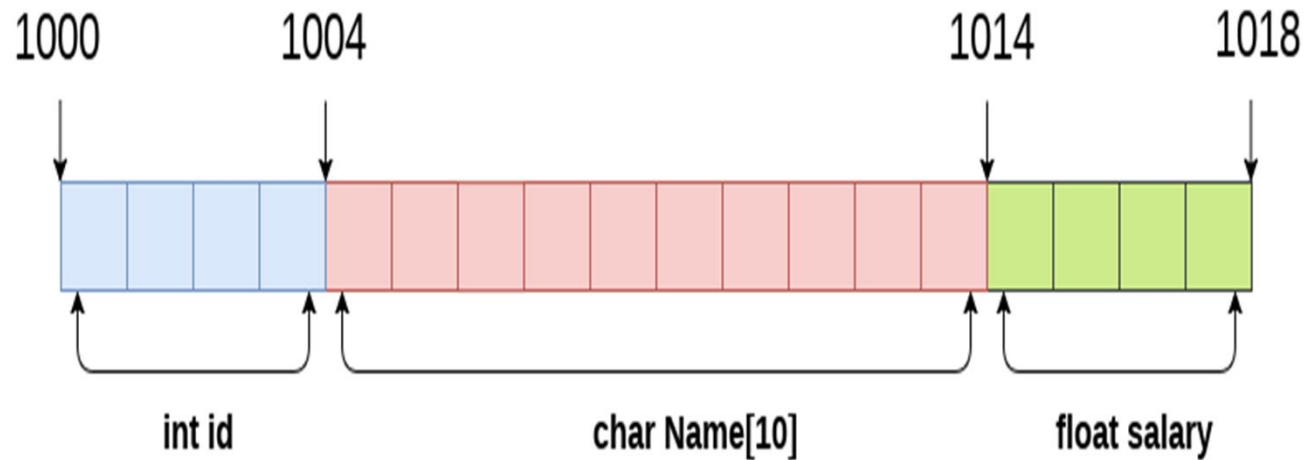
Example

struct employee

{   int id;

   char name[10];

   float salary;

};

Example


```
struct Employee          sizeof (emp)  =   4 + 10 + 4 = 18 bytes
{
    int id;              where;
    char Name[10];        sizeof (int) = 4 byte
    float salary;         sizeof (char) = 1 byte
} emp;                    sizeof (float) = 4 byte
```
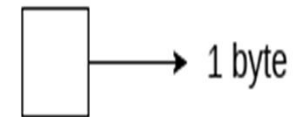
Why structure?

- In C, there are cases where we need to store multiple attributes of an entity.

- It is not necessary that an entity has all the information of one type only.

- It can have different attributes of different data types.

- For example, an entity **Student** may have its name (string), roll number (int), marks (float).

To store such type of information regarding an entity student, we have the following approaches:

- Construct individual arrays for storing names, roll numbers, and marks.

- Use a special data structure to store the collection of different data types.

Drawback of Array:Example

#include<stdio.h>

 void main ()

{

char names[2][10],dummy;

// 2-dimensioanal character array names is used to store the names of the students

int roll_numbers[2],i;

float marks[2];

```
for (i=0;i<3;i++)

 {

  printf("Enter the name, roll number, and marks of the student %d",i+1);

  scanf("%s %d %f", &names[i], &roll_numbers[i], &marks[i]);

  scanf("%c",&dummy); // enter will be stored into dummy character at each

  iteration

 }
```

Conti….

printf("Printing the Student details ...\n");

```
 for (i=0;i<3;i++)

 {

  printf("%s %d %f\n", names[i], roll_numbers[i], marks[i]);

 }

}
```

Output

- Enter the name, roll number, and marks of the student 1Arun 90 91

- Enter the name, roll number, and marks of the student 2Varun 91 56

- Enter the name, roll number, and marks of the student 3Sham 89 69

- Printing the Student details...

- Arun 90 91.000000

- Varun 91 56.000000

- Sham 89 69.000000

Conti...

- The above program may fulfill our requirement of storing the information of an entity student.

- **However, the program is very complex, and the complexity increase with the amount of the input.**

- **The elements of each of the array are stored contiguously, but all the arrays may not be stored contiguously in the memory.**

Assessment 1

1. What is structure?

Ans : _____

2. Write syntax for structure.

Ans : _____

References

1. Reema Thareja, "Programming in C", Oxford University Press, Second Edition, 2016

Thank You