SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE NAME : 23ITT101 Problem solving and C Programming

I YEAR /I SEMESTER

Unit 5- Structures and Unions

Topic 1,2&3: Structure definition-Structure declaration-Need for structure data type

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.
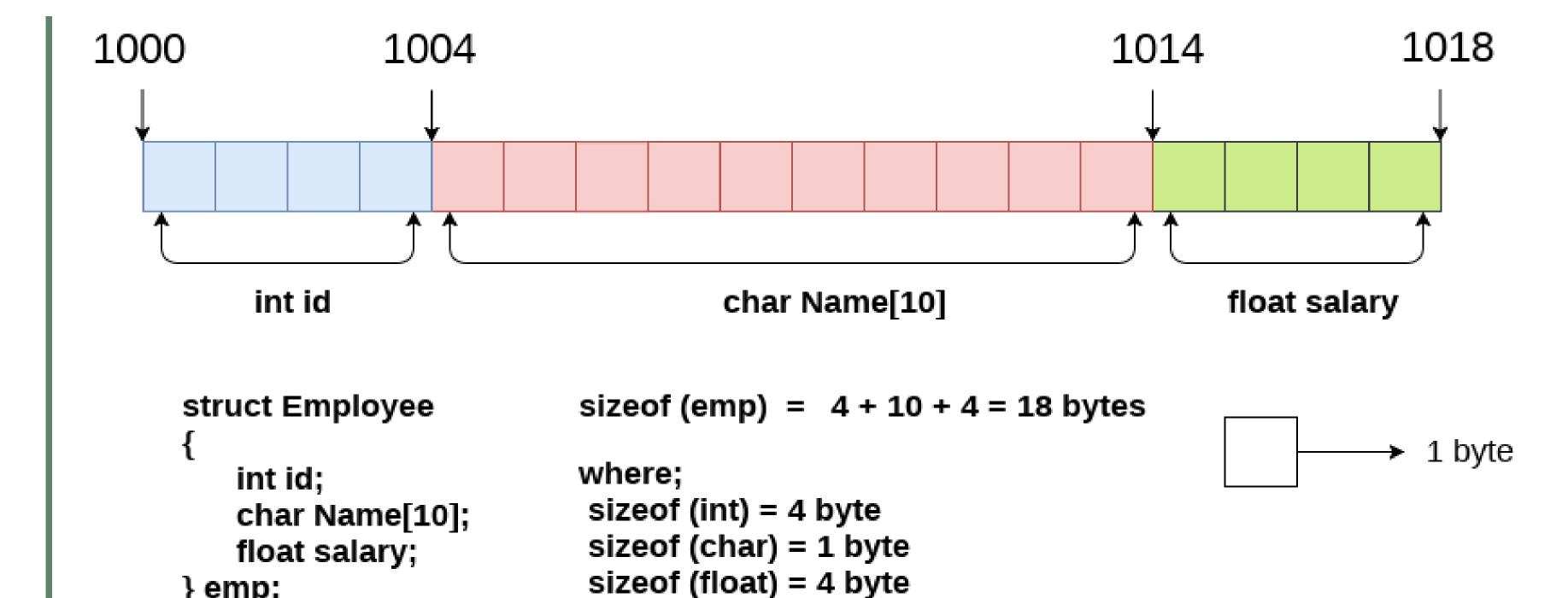
- Keyword: **struct**

Structure definition

```
struct structure_name

{

    data_type member1;

    data_type member2;

    .

    .

    data_type memeberN;

};
```

```
struct employee

{   int id;

    char name[10];

    float salary;

};
```

structure declararion-need for structure/ Problem solving and c programming/Dr.K.Periyakaruppan/CSE/SNSCE

Example

1000   1004   1014   1018

int id   char Name[10]   float salary

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

1 byte

Need for structure data type?

- 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.

Declaring structure variable

- There are two ways to declare structure variable:

  - By struct keyword within main() function

  - By declaring a variable at the time of defining the structure.

1st way:

struct employee

{   int id;

  char name[50];

  float salary;

};

- Now write below code inside the main() function.

- **struct employee e1, e2;**

- The variables e1 and e2 can be used to access the values stored in the structure. Here, e1 and e2 can be treated in the same way as the objects in C++ and Java.

2nd way:

- Declare structure variable at the time of defining the structure.

struct employee

{

  int id;

  char name[50];

  float salary;

}e1,e2;

Which approach is good?

- If number of variables are not fixed, use the 1st approach. It provides you the flexibility to declare the structure variable many times.

- If no. of variables are fixed, use 2nd approach. It saves your code to declare a variable in main() function.

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

// create struct with person1 variable
struct Person {
  char name[50];
  int ENo;
  float salary;
} person1;

int main() {

  // assign value to name of person1
  strcpy(person1.name, "Ravi");

  // assign values to other person1 variables
  person1.ENo = 1984;
  person1. salary = 25500;

  // print struct variables
  printf("Name: %s\n", person1.name);
  printf("ENo.: %d\n", person1.ENo);
  printf("Salary: %.2f", person1.salary);

  return 0;
}
```

Output:
Name: Ravi
ENo.: 1984
salary: 25500.00

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