

Structure and Union in C Language

Module 03 - Union in C Language

 CBSE

Union is a collection of variables of different data types, in case of union information can only be stored in one field at any one time.

 ICSE

A union is a special data type available in C that enables you to store different data types in the same memory location.

 NTSE

We can define a union with many members, but only one member can contain a value at any given time. Unions provide an efficient way of using the same memory location for multi-purpose.

 Banking & Insurance

 Central Govt. Service

 State Govt. Services

 LAW Entrance

 MBA Entrance

 Railways & Metro Services

...many more

abhyasonline.in

Declaring Union

```
union union-name  
{  
    data_type var-name;  
  
    data_type var-name;  
  
};
```

A **union** is similar to a structure in that it also groups different data types together.

However, the key difference is that **all members of a union share the same memory location**. In a union, only one member can hold a value at any given time. A union is more memory-efficient than a structure because the memory used is the size of the largest member.

Course
&
Test Series

Introduction to 'C' Language

Solved Example of Union in C Language

Example:

```
c Copy code  
  
#include <stdio.h>  
  
// Defining a union for storing a number as either an integer or a float  
union Data {  
    int intVal;  
    float floatVal;  
};  
  
int main() {  
    // Declaring a variable of type 'Data'  
    union Data data;  
  
    // Assigning values to the union members  
    data.intVal = 10; // Store an integer  
    printf("Integer Value: %d\n", data.intVal);  
  
    data.floatVal = 3.14; // Store a float  
    printf("Float Value: %.2f\n", data.floatVal);  
  
    // Accessing the integer value after storing a float  
    printf("Integer Value after storing float: %d\n", data.intVal);  
  
    return 0;  
}
```

Explanation:

- In this example, union Data can store either an int or a float. However, it cannot store both at the same time.
- After assigning a value to intVal, we assigned a new value to floatVal. When we printed intVal after modifying floatVal, the value of intVal was overwritten because both members of the union use the same memory.
- Unions are ideal when you need to store one value at a time from different data types but want to optimize memory usage.

CBSE

ICSE

NTSE

Banking & Insurance

Central Govt. Service

State Govt. Services

LAW Entrance

MBA Entrance

Railways & Metro Services

...many more

abhyasonline.in



Course
&
Test Series

Introduction to 'C' Language

Key Points:

- A union can store only one member's value at any given time.
- The size of a union is the size of its largest member.
- Unions are used when memory efficiency is a priority, and the data type being stored may change dynamically.

Comparison Between Structure and Union:

Feature	Structure	Union
Memory Allocation	Each member gets separate memory space.	All members share the same memory space.
Memory Size	Size of the structure = sum of sizes of all members.	Size of the union = size of the largest member.
Accessing Members	All members can be accessed independently.	Only one member can be accessed at a time.
Use Case	When you need to store different types of data at the same time.	When you need to store different types of data, but only one at a time.

When to Use a Structure or a Union?

- Use a **structure** when you need to store multiple pieces of data together, and each piece will be used at the same time. For example, in a student record, you might store name, roll number, and marks, where each piece of information is always needed together.
- Use a **union** when you need to store different types of data but only need one piece of data at a time. Unions are more memory-efficient because they only use as much memory as the largest member.

 CBSE

 ICSE

 NTSE

 Banking & Insurance

 Central Govt. Service

 State Govt. Services

 LAW Entrance

 MBA Entrance

 Railways & Metro Services

...many more

abhyasonline.in