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Introduction to C Union

Union is a user-defined data type in c, it allows storing of different data elements of dif
data types to be stored in the same memory location. It provides an efficient way of utilizing the memory, as only one member of a union can be accessed at any given point of time. The size of

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Syntax:

A union can be defined as below.

```
union UnionName
{
UMember1;
UMember2;
UMember3;
} UnionReference;
```

The C Union members can be accessed using the reference 'UnionReference'. union is a keyword.

Example of struct and union in memory allocation:

Let us demonstrate the difference between struct and union in memory allocation.

Code:


```
#include <stdio.h>
struct samp_structure
{
```

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```
}s;
union s_union
{
char name1[30];
int e_id;
float saly;
}u;
int main()
{
printf("size of structure :%ld bytes \n", sizeof(s));
printf("size of union : %ld bytes\n", sizeof(u));
return 0;
}
```

Output:

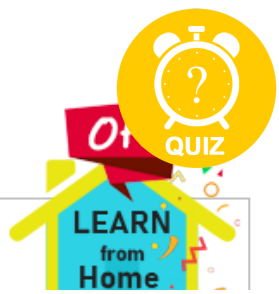
```
size of  structure  :100 bytes
size of  union  : 32 bytes
```

Examples of C Union

Let us see the implementation with the help of the examples mentioned below:

Example #1

This is the example to define a C union and accessing its members.



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Code:

```
#include <stdio.h>
#include <string.h>
union test {
int tint;
float tf;
char tstr[20];
};

int main( ) {
union test t;
t.tint = 100;
```

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```
printf( "record.str : %s\n", t.tstr);
return 0;
}
```

Output:

Example #2

Below is the same code as above except that the print statements have been rearranged.

Code:

```
#include <stdio.h>
#include <string.h>
union test {
int tint;
float tf;
char tstr[20];
};
int main( ) {
union test t;
t.tint = 100;
t.tf = 200.5;
strcpy( t.tstr, "Test");
printf( "record.i : %d\n", t.tint);
```

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Output:

If you look at the output carefully, you can see that garbage values have been assigned for int and float because the string was allotted the memory, at last, i.e. since the members share the memory in a union the member whose value is currently stored will have access to the memory.

Example #3

Anonymous union is a union that is not named, hence they can be used inside any nested structure (https://www.educba.com/nested-structure-in-c/) or unions. The members of the anonymous union can be directly accessed within the scope of their definition. Similarly, Anonymous structure can be used inside an anonymous union.

Syntax of Anonymous union and structure as follows:

```
// Anonymous union example
union
{
char anoUChar;
int anoUNum;
};
// Anonymous structure example
struct
{
```

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Example of anonymous struct union inside a struct:

```
#include<stdio.h>
struct testscope
{
// Anonymous union
union
{
char testChar;
int testNum;
int testNum2;
};
};
int main()
{
struct testscope ts;
ts.testNum = 65;
// Note that members of union are accessed directly
printf("testchar = %c, testnum = %d,testnum2 = %d", ts.testChar,
ts.testNum,ts.testNum2);
return 0;
}
```

Output:

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Example of anonymous struct inside a union:

```
#include<stdio.h>
union testscope
{
// Anonymous union
struct
{
char testChar;
int testNum;
int testNum2;
};
};
int main()
{
union testscope ts;
ts.testNum = 65;
ts.testChar='V';
//Note: The members of struct are accessed directly
printf("testchar = %c, testnum = %d,testnum2 = %d", ts.testChar,


ts.testNum,ts.testNum2);
return 0;
}
```

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Conclusion

Thus, the union helps in managing memory efficiently. The drawback of the union is that only the last entered value to the union will only be available. It should be used when members of the union need not be available to be accessed at the same time.

Recommended Articles

This is a guide to C Union. Here we discuss the introduction, syntax, and different examples of c union with code implementation. You may also look at the following articles to learn more-

1. C Keywords (https://www.educba.com/c-keywords/)
2. Arrays in C Programming (https://www.educba.com/arrays-in-c-programming/)
3. Palindrome Program in C++ (https://www.educba.com/palindrome-program-in-c-plus-plus/)
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