**C++ Bit Fields** (Mahesh, 2008)

**What are bit-fields?**

* Bit fields provide a mechanism to optimize memory usage by allowing the coder to specify the exact number of bits required to store data.
* Quite useful in embedded programming like mobile phones where memory is limited.
* The declaration of bit field members follows the syntax "variable name : number of bits".
* Unnamed bit fields with width 0 are used for alignment of the next bit field to the field type boundary.

EXAMPLE: Demonstrate the usage of bit fields.

#include <iostream>  
#include <assert>  
using namespace std;  
  
class MyTime {  
  
 unsigned int hour : 5;  
 unsigned int mins : 6;  
 unsigned int secs : 6;  
  
public:  
  
 void SetHour(int aHour) {  
 assert ( aHour < 24 );  
 hour = aHour;  
 }  
  
 void SetMins(int aMins) {  
 assert ( aMins < 60 );  
 mins = aMins;  
 }  
  
 void SetSecs(int aSecs) {  
 assert ( aSecs < 60 );  
 secs = aSecs;  
 }  
  
 void Print() {  
 cout << hour << ":" << mins << ":" << secs << endl;  
 }  
};  
  
int main()  
{  
 MyTime t;  
 t.SetHour(12);  
 t.SetMins(58);  
 t.SetSecs(23);  
 t.Print();  
  
 cout << "Size of MyTime = " << sizeof(t) << endl;  
}  
  
OUTPUT:-  
12:58:23  
Size of MyTime = 4

By the way, while most bit fields are unsigned int types, you can also have bool bit fields; since, bool in C++ is an integral type.

# Works Cited

Mahesh. (2008, June 27). *C++ Bit Fields* . Retrieved August 1, 2012, from The Tutorial Site: http://login2win.blogspot.com/2008/06/c-bit-fields.html