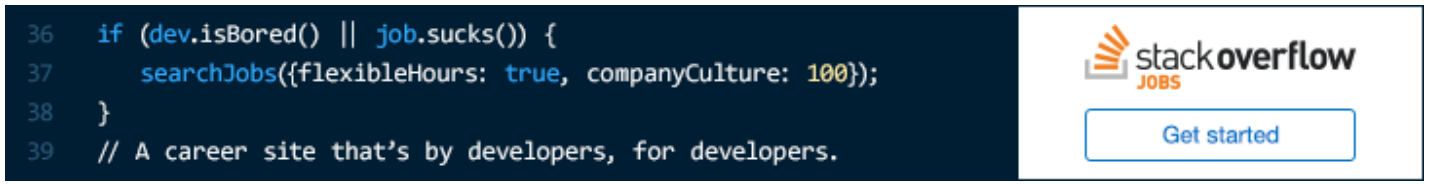
What is forward declaration in c++?



This answer says:

> … Finally,
>
> ```
> typedef struct { ... } Foo;
> ```
>
> declares an anonymous structure and creates a typedef for it. Thus, with this construct, it doesn't have a name in the tag namespace, only a name in the typedef namespace. This means it also can't be forward-declared. If you want to make a forward declaration, you have to give it a name in the tag namespace.

What is forward declaration?

c++ forward-declaration

edited Feb 7 '11 at 21:26
Fred Nurk
10.6k 3 25 51

asked Feb 7 '11 at 20:20
lital maatuk
1,770 10 43 68

You cannot forward declare an *anonymous* struct. – John Feb 7 '11 at 20:32

@FredN I'm really not sure what you're pointing at. (This is not helped by the **"this answer"** link linking to the **question**, so we don't know which answer was meant.) In C++, you can forward-declare a class, but not a typedef name. A "forward declaration" of a class is a class declaration. – sbi Feb 7 '11 at 21:20

@sbi: While you're right that the OP was vague (and new to the site so didn't know how to correctly link to a specific answer), there are only two answers on that question that say you cannot forward declare a typedef, and someone looking at either of those answers (I've included the more complete quote from one answer above) will have the context needed to really answer this. – Fred Nurk Feb 7 '11 at 21:52

Please note that this question is tagged **C++** but the quote refers to **C** – MSalters Feb 8 '11 at 8:22

5 Answers

Chad has given a pretty good dictionary definition. Forward declarations are often used in C++ to deal with circular relationships. For example:

```
class B; // Forward declaration

class A
{
    B* b;
};

class B
{
    A* a;
};
```

answered Feb 7 '11 at 20:26

Fred Larson
40k 8 81 112

"In computer programming, a forward declaration is a declaration of an identifier (denoting an entity such as a type, a variable, or a function) for which the programmer has not yet given a complete definition."

-Wikipedia

answered Feb 7 '11 at 20:22

Chad La Guardia
3,122 2 16 29

I read the linked post. And I think this answers the question (in both the title and the post) "What is forward declaration?" Anonymous structs are moot to the question, albeit the OP is incorrect in saying that typedefs cannot be forward declared. – Chad La Guardia Feb 7 '11 at 21:05

4 Tautologies are not the answer: xkcd.com/703 – allyourcode Jun 20 '11 at 2:03

To the best of my knowledge, in C++ the term "forward declaration" is a misnomer. It's simply a ***declaration*** under a fancy name.

edited Feb 7 '11 at 21:45

answered Feb 7 '11 at 21:16

sbi
142k 36 187 360

Thank you for clarifying that this is NOT a special type of declaration. It's very easy to think that it is from the way people discuss it! – allyourcode Jun 20 '11 at 2:06

On the other hand, why did people see the need to create a special term for a concept that isn't so special?

– allyourcode Jun 20 '11 at 2:22

1 @allyourcode: TTBOMK Stroustrup introduced that name decades before the standard wording was crafted I quoted in the answer I linked to. I can only assume that the name was chosen based on what that declaration was used for, while nobody thought about the bigger picture. Remember that C++ evolved according to concrete needs while those using it limbed along. (Yes, everything was added according to the principle of not adding features to support a single use case. What I was getting at is that it wasn't born wholly in a single act of creation.) – sbi Jun 20 '11 at 6:37

A fowrard declaration declares the identifier (puts it in a namespace) before the actual definition. You need forward declaration of structs if you need to use a pointer to the struct before the struct is defined.

In the context of the answer you linked, if you have `typedef struct {...} Foo;` , you cannot use a pointer to Foo inside the struct or before the end of the typedef statement.

On the other hand you can `typedef struct tagFoo Foo;` and later `struct tagFoo {...};`

answered Feb 7 '11 at 20:29

John
4,581 1 14 34

No need for a new name: typedef struct Foo Foo; struct Foo {}; – Fred Nurk Feb 7 '11 at 21:59

Good answer, but note that you can also use forward declarations of classes and structs as function parameters and return values. – Tom Jul 25 '12 at 10:04

Forward declaration is needed when a class member uses a reference of another class in it. E.g.:

```
class AB; // forward declaration
class A {
public:
    int j;
    void sum(AB a) {
        return a.i + j;
    }
};
```

```
class AB{
public:
    int i;
};
```

edited Jul 15 '15 at 8:08

Sverri M. Olsen
10.1k 3 18 48

answered Jul 15 '15 at 8:01

Roshni Gandhi
20 6