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forward class declaration

Krahl (63)

Jun 22, 2011 at 6:54am

Can anybody help me with the following error on build. I thought if you only use a reference to a class type you can place a forward declaration.

```
player.cpp(111): error C2027: use of undefined type 'Monster'
```

EDIT: The problem is solved by #including Monster.h in Player.cpp and #including Player.h in Monster.cpp. So do you need to include header files of classes in .cpp files regardless of whether they are passed by reference?

this is Player.h

```
1 //Player.h
2 #ifndef PLAYER_H
3 #define PLAYER_H
4
5 #include "Weapon.h"
6 #include <string>
7
8 class Monster;
9
10 class Player{
11 public:
12     Player();
13     bool isDead();
14     std::string getName();
15     int getArmor();
16     void takeDamage(int damage);
17     void createClass();
18     bool attack(Monster& monster);
19     void levelUp();
20     void rest();
21     void viewStats();
22     void victory(int xp);
23     void gameover();
24     void displayHitPoints();
25 private:
26     std::string mName;
```

```
27         std::string mClassName;
28         int mAccuracy;
29         int mHitPoints;
30         int mMaxHitPoints;
31         int mExpPoints;
32         int mNextLevelExp;
33         int mLevel;
34         int mArmor;
35         Weapon mWeapon;
36     };
37
38 #endif
```

this is Player.cpp.

```
1 //Player.cpp
2 #include "Player.h"
3 #include "Random.h"
4 #include "Weapon.h"
5 #include <iostream>
6 using namespace std;
7
8 Player::Player(){
9     mName = "Default";
10    mClassName = "Default";
11    mAccuracy = 0;
12    mHitPoints = 0;
13    mMaxHitPoints = 0;
14    mExpPoints = 0;
15    mNextLevelExp = 0;
16    mLevel = 0;
17    mArmor = 0;
18    mWeapon.mName = "Default Weapon Name";
19    mWeapon.mDamageRange.mHigh = 0;
20    mWeapon.mDamageRange.mLow = 0;
21 }
22
23 bool Player::isDead(){
24     return mHitPoints <= 0;
25 }
26
27 int Player::getArmor(){
28     return mArmor;
29 }
30
31 void Player::takeDamage(int damage){
32     mHitPoints -= damage;
33 }
34
35 void Player::createClass(){
```

```
36 cout << "CHARACTER CLASS GENERATION" << endl;
37 cout << "===== " << endl;
38
39 cout << "Enter your character's name: ";
40 getline(cin,mName);
41
42 cout << "Please select a character class number..." << endl;
43 cout << "1)Fighter 2)Wizard 3)Cleric 4)Thief: ";
44 int characterNum = 1;
45 cin >> characterNum;
46
47 switch(characterNum){
48 case 1:
49     mClassName = "Fighter";
50     mAccuracy = 10;
51     mHitPoints = 20;
52     mMaxHitPoints = 20;
53     mExpPoints = 0;
54     mNextLevelExp = 1000;
55     mLevel = 1;
56     mArmor = 4;
57     mWeapon.mName = "Long Sword";
58     mWeapon.mDamageRange.mLow = 1;
59     mWeapon.mDamageRange.mHigh = 8;
60     break;
61 case 2:
62     mClassName = "Wizard";
63     mAccuracy = 5;
64     mHitPoints = 10;
65     mMaxHitPoints = 10;
66     mExpPoints = 0;
67     mNextLevelExp = 1000;
68     mLevel = 1;
69     mArmor = 1;
70     mWeapon.mName = "Staff";
71     mWeapon.mDamageRange.mLow = 1;
72     mWeapon.mDamageRange.mHigh = 4;
73     break;
74 case 3:
75     mClassName = "Cleric";
76     mAccuracy = 8;
77     mHitPoints = 15;
78     mMaxHitPoints = 15;
79     mExpPoints = 0;
80     mNextLevelExp = 1000;
81     mLevel = 1;
82     mArmor = 3;
83     mWeapon.mName = "Flail";
84     mWeapon.mDamageRange.mLow = 1;
85     mWeapon.mDamageRange.mHigh = 6;
86     break;
```

```
87         default:
88             mClassName = "Thief";
89             mAccuracy = 7;
90             mHitPoints = 12;
91             mMaxHitPoints = 12;
92             mExpPoints = 0;
93             mNextLevelExp = 1000;
94             mLevel = 1;
95             mArmor = 2;
96             mWeapon.mName = "Short Sword";
97             mWeapon.mDamageRange.mLow = 1;
98             mWeapon.mDamageRange.mHigh = 6;
99             break;
100     }
101 }
102
103 bool Player::attack(Monster& monster){
104     int selection = 1;
105     cout << "1) Attack, 2) Run: ";
106     cin >> selection;
107     cout << endl;
108
109     switch(selection){
110     case 1:
111         cout << "You attack a(n) " << monster.getName() << " with a(n) "
112             << mWeapon.mName << endl;
113         if(Random(0,20) < mAccuracy){
114             int damage = Random(mWeapon.mDamageRange);
115             int totalDamage = damage - monster.getArmor();
116             if(totalDamage <= 0){
117                 cout << "Your attack failed to penetrate " << monster.getName()
118                     << "'s armor." << endl;
119             }
120             else{
121                 cout << "You attack for " << totalDamage << " damage!" << endl;
122                 monster.takeDamage(totalDamage);
123             }
124         }
125         else{
126             cout << "You miss!" << endl;
127         }
128         cout << endl;
129         break;
130     case 2:
131         if(Random(1,4) == 1){
132             cout << "You run away!" << endl;
133             return true;
134         }
135         else{
136             cout << "You could not escape!" << endl;
137             break;
138         }
139     }
140 }
```

```

138         }
139     }
140     return false;
141 }
142
143 void Player::levelUp(){
144     if(mExpPoints >= mNextLevelExp){
145         cout << "You gained a level!" << endl;
146         mLevel++;
147         mNextLevelExp = mLevel * mLevel * 1000;
148         mAccuracy += Random(1,3);
149         mMaxHitPoints += Random(2,6);
150         mArmor += Random(1,2);
151         mHitPoints = mMaxHitPoints;
152     }
153 }
154
155 void Player::rest(){
156     cout << "Resting..." << endl;
157
158     mHitPoints = mMaxHitPoints;
159 }
160
161 void Player::viewStats(){
162     cout << "PLAYER STATS" << endl;
163     cout << "======" << endl;
164     cout << endl;
165
166     cout << "Name" << mName << endl;
167     cout << "Class" << mClassName << endl;
168     cout << "Accuracy" << mAccuracy << endl;
169     cout << "Hitpoints" << mHitPoints << endl;
170     cout << "Max hitpoints" << mMaxHitPoints << endl;
171     cout << "Xp" << mExpPoints << endl;
172     cout << "Xp for next level" << mNextLevelExp << endl;
173     cout << "Level" << mLevel << endl;
174     cout << "Armor" << mArmor << endl;
175     cout << "Weapon name" << mWeapon.mName << endl;
176     cout << "Weapon damage" << mWeapon.mDamageRange.mLow << "-"
177         << mWeapon.mDamageRange.mLow << endl;
178     cout << endl;
179     cout << "END PLAYER STATS" << endl;
180     cout << "======" << endl;
181     cout << endl;
182 }
183
184 void Player::victory(int xp){
185     cout << "You won the battle!" << endl;
186     cout << "You win " << xp << " experience points!" << endl;
187     mExpPoints += xp;
188 }

```

```

189
190 void Player::gameover(){
191     cout << "You died in battle..." << endl << endl;
192     cout << "======" << endl;
193     cout << "GAME OVER!" << endl;
194     cout << "======" << endl;
195     cout << "Press 'q' to quit: " << endl;
196     char q = 'q';
197     cin >> q;
198     cout << endl;
199 }
200
201 void Player::displayHitPoints(){
202     cout << mName << "'s hitpoints = " << mHitPoints << endl;
203 }


```

thanks

K


Last edited on Jun 22, 2011 at 7:13am

Computergeek01 (5490)

 Jun 22, 2011 at 7:52am

That all looks to be in order but do you ever actually define the class "Monster"?

hamsterman (4538)

 Jun 22, 2011 at 7:54am

You can pass a class& without defining it. What you can't do is access its members.

Krahl (63)

 Jun 23, 2011 at 3:26am

Yes the class Monster is defined in Monster.h.

Summing it up this is how it looked.

```

1 //Monster.h
2 class Player;
3
4 class Monster{
5 public:
6     void function(Player& player);
7 private:
8     Player& player;
9 };
10

```

```
11 //Player.h
12 class Monster;
13
14 class Player{
15 public:
16     void function(Monster& monster);
17 private:
18     Monster& monster;
19 };
20
21 //Player.cpp
22
23 #include "Player.h"
24
25 void function(Monster& monster){}
26
27 //Monster.cpp
28
29 #include "Monster.h"
30
31 void function(Player& player){}
32
```


I thought since in the method files the instances of the other classes appear as references only a forward definition is sufficient. I also thought that the forward definition would be taken from including the corresponding header files. But the problem was solved by including the .h files of the used classes explicitly. Not sure if I could explain it well. Any clarification on this matter?

@hamsterman

I understand. I think that was the problem.

Last edited on Jun 23, 2011 at 3:30am

Computergeek01 (5490)

 Jun 23, 2011 at 3:58am

None of your other classes headers seem to be including "Monster.h".

Krahl (63)

 Jun 23, 2011 at 4:00am


They don't need to include Monster.h the problem is solved by including "Monster.h" in the .cpp files only not the other header files. The .h's only need forward declarations and the .cpp's need the actual include file

Last edited on Jun 23, 2011 at 4:02am

Computergeek01 (5490)


 Jun 23, 2011 at 4:12am

If you had the "Monster.h" file in the headers you wouldn't need to forward declaration, that's pretty much what I wanted to point out

hamsterman (4538) Jun 23, 2011 at 4:21am

I also thought that the forward definition would be taken from including the corresponding header files.

It would be nice, but no. In c++ you have to state things explicitly. A & or * work because to pass them program doesn't need any information about the types they point to. Technically all * and &s are the same. Forward declaration is there to tell the compiler that Monster is actually a type and it doesn't need to throw the "undeclared identifier" error.

Krahl (63) Jun 23, 2011 at 11:02am

Thanks hamsterman and computergeek for your help.

Cheers

K

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