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Singleton.txt

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```

1 #include <iostream>
2 using namespace std;
3
4 class SingletonClass
5 {
6     int m_value;
7     // the following declaration states that class Singleton has
8     // a private class field of type pointer to SingletonClass
9     // named theInstance.
10    // However the definition of the variable is done outside class
11    // (just as an external static variable in C) - see below
12    static SingletonClass *theInstance;
13
14    SingletonClass(int v = 0)
15    {
16        m_value = v;
17    }
18 public:
19    int get_value()
20    {
21        return m_value;
22    }
23    void set_value(int v)
24    {
25        m_value = v;
26    }
27    static SingletonClass *getInstance()
28    {
29        if (!theInstance)
30            theInstance = new SingletonClass(10);
31        return theInstance;
32    }
33
34    static int c_value;
35 };
36
37 // Access specifiers will not give you error while defining the member.
38 SingletonClass *SingletonClass::theInstance;
39 int SingletonClass::c_value = 128;
40
41 // You can also declare regular external/external static variables
42 int regularExternal = 44;
43 static int regularExternalStatic;
44
45 void main() {
46     SingletonClass *singleton1 = SingletonClass::getInstance();
47     SingletonClass *singleton2 = SingletonClass::getInstance();
48
49     // You cannot do the following since theInstance is private
50     // SingletonClass *singleton3 = SingletonClass::theInstance;
51
52     // the following three statements are ok
53     SingletonClass::c_value = 24;
54     regularExternal = 22;
55     regularExternalStatic = -4;
56 }
57

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58 ; Listing generated by Microsoft (R) Optimizing Compiler Version 19.12.25834.0
59
60     TITLE      c:\K-State\cis450\Programs\CoursePrograms\Chap3\Singleton\Single
61     ton.cpp
62     .686P
63     .XMM
64     include listing.inc
65     .model flat
66
67 INCLUDELIB LIBCMT
68 INCLUDELIB OLDNAMES
69
70 PUBLIC ?theInstance@SingletonClass@@0PAV1@A ; SingletonClass::theIns
71 tance
72 PUBLIC ?c_value@SingletonClass@@2HA ; SingletonClass::c_valu
73 e
74 PUBLIC ?regularExternal@@3HA ; regularExternal
75 _BSS SEGMENT
76 ?theInstance@SingletonClass@@0PAV1@A DD 01H DUP (?) ; SingletonClass::theIns
77 tance
78 _BSS ENDS
79 _DATA SEGMENT
80 ?c_value@SingletonClass@@2HA DD 080H ; SingletonClass::c_valu
81 e
82 ?regularExternal@@3HA DD 02cH ; regularExternal
83 _DATA ENDS
84 PUBLIC ??0SingletonClass@@AAEH@Z ; SingletonClass::Single
85 tonClass
86 PUBLIC ?getInstance@SingletonClass@@SAPAV1@XZ ; SingletonClass::getIns
87 tance
88 PUBLIC _main ; operator new
89 EXTRN ??2@YAPAXI@Z:PROC ; regularExternalStatic
90 _BSS SEGMENT
91 ?regularExternalStatic@@3HA DD 01H DUP (?) ; regularExternalStatic
92 _BSS ENDS
93 ; Function compile flags: /Odtp
94 ; File c:\k-state\cis450\programs\courseprograms\chap3\singleton\singleton.cpp
95 _TEXT SEGMENT
96 _singleton2$ = -8 ; size = 4
97 _singleton1$ = -4 ; size = 4
98 _main PROC
99 ; 45 : void main() {
100
101 00000 55 push ebp
102 00001 8b ec mov ebp, esp
103 00003 83 ec 08 sub esp, 8
104
105 ; 46 : SingletonClass *singleton1 = SingletonClass::getInstance();
106
107 00006 e8 00 00 00 00 call ?getInstance@SingletonClass@@SAPAV1@XZ ; Single
108 tonClass::getInstance
109 0000b 89 45 fc mov DWORD PTR _singleton1$[ebp], eax
110
111 ; 47 : SingletonClass *singleton2 = SingletonClass::getInstance();
112
113 0000e e8 00 00 00 00 call ?getInstance@SingletonClass@@SAPAV1@XZ ; Single
114 tonClass::getInstance
115 00013 89 45 f8 mov DWORD PTR _singleton2$[ebp], eax
116
117 ; 48 :
118
119 ; 49 : // You cannot do the following since theInstance is private
120 ; 50 : // SingletonClass *singleton3 = SingletonClass::theInstance;
121 ; 51 :
122 ; 52 : // the following three statements are ok
123 ; 53 : SingletonClass::c_value = 24;
124
125 00016 c7 05 00 00 00 mov DWORD PTR ?c_value@SingletonClass@@2HA, 24 ; Si
126 ngletonClass::c_value, 00000018H
127
128 ; 54 : regularExternal = 22;
129
130

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121 00020 c7 05 00 00 00
122 00 16 00 00 00 mov     DWORD PTR ?regularExternal@@3HA, 22 ; regularEx
ternal, 00000016H
123
124 ; 55 : regularExternalStatic = -4;
125
126 0002a c7 05 00 00 00
127 00 fc ff ff ff mov     DWORD PTR ?regularExternalStatic@@3HA, -4 ; fff
ffffcH
128
129 ; 56 : }
130
131 00034 33 c0 xor     eax, eax
132 00036 8b e5 mov     esp, ebp
133 00038 5d pop     ebp
134 00039 c3 ret     0
135 _main ENDP
136 _TEXT ENDS
137 ; Function compile flags: /Odtp
138 ; File c:\k-state\cis450\programs\courseprograms\chap3\singleton\singleton.cpp
139 ; COMDAT ??0SingletonClass@@AAEH@Z
140 _TEXT SEGMENT
141 tv74 = -8 ; size = 4
142 $T1 = -4 ; size = 4
143 ?getInstance@SingletonClass@@@SAPAV1@XZ PROC ; SingletonClass::getIns
tance, COMDAT
144
145 ; 28 : {
146
147 00000 55 push     ebp
148 00001 8b ec mov     ebp, esp
149 00003 83 ec 08 sub     esp, 8
150
151 ; 29 : if (!theInstance)
152
153 00006 83 3d 00 00 00 cmp     DWORD PTR ?theInstance@SingletonClass@@@0PAV1@A,
154 00 00 ; SingletonClass::theInstance
155 0000d 75 31 jne     SHORT $LN2@getInstanc
156
157 ; 30 : theInstance = new SingletonClass(10);
158
159 0000f 6a 04 push     4
160 00011 e8 00 00 00 00 call    ??2@YAPAXI@Z ; operator new
161 00016 83 c4 04 add     esp, 4
162 00019 89 45 fc mov     DWORD PTR $T1[ebp], eax
163 0001c 83 7d fc 00 cmp     DWORD PTR $T1[ebp], 0
164 00020 74 0f je      SHORT $LN4@getInstanc
165 00022 6a 0a push     10 ; 0000000aH
166 00024 8b 4d fc mov     ecx, DWORD PTR $T1[ebp]
167 00027 e8 00 00 00 00 call    ??0SingletonClass@@AAEH@Z ; SingletonClass::Si
ngletonClass
168 0002c 89 45 f8 mov     DWORD PTR tv74[ebp], eax
169 0002f eb 07 jmp     SHORT $LN5@getInstanc
170 $LN4@getInstanc:
171 00031 c7 45 f8 00 00 mov     DWORD PTR tv74[ebp], 0
172 00 00
173 $LN5@getInstanc:
174 00038 8b 45 f8 mov     eax, DWORD PTR tv74[ebp]
175 0003b a3 00 00 00 00 mov     DWORD PTR ?theInstance@SingletonClass@@@0PAV1@A,
eax ; SingletonClass::theInstance
176 $LN2@getInstanc:
177
178 ; 31 : return theInstance;
179
180 00040 a1 00 00 00 00 mov     eax, DWORD PTR ?theInstance@SingletonClass@@@0PA
V1@A ; SingletonClass::theInstance
181
182 ; 32 : }
183
184 00045 8b e5 mov     esp, ebp
185 00047 5d pop     ebp
186 00048 c3 ret     0

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187 ?getInstance@SingletonClass@@@SAPAV1@XZ ENDP ; SingletonClass::getIns
tance
188 _TEXT ENDS
189 ; Function compile flags: /Odtp
190 ; File c:\k-state\cis450\programs\courseprograms\chap3\singleton\singleton.cpp
191 ; COMDAT ??0SingletonClass@@AAEH@Z
192 _TEXT SEGMENT
193 _this$ = -4 ; size = 4
194 _v$ = 8 ; size = 4
195 ??0SingletonClass@@AAEH@Z PROC ; SingletonClass::Single
tonClass, COMDAT
196 ; _this$ = ecx
197
198 ; 14 : SingletonClass(int v = 0)
199
200 00000 55 push     ebp
201 00001 8b ec mov     ebp, esp
202 00003 51 push     ecx
203 00004 89 4d fc mov     DWORD PTR _this$[ebp], ecx
204
205 ; 15 : {
206 ; 16 : m_value = v;
207
208 00007 8b 45 fc mov     eax, DWORD PTR _this$[ebp]
209 0000a 8b 4d 08 mov     ecx, DWORD PTR _v$[ebp]
210 0000d 89 08 mov     DWORD PTR [eax], ecx
211
212 ; 17 : }
213
214 0000f 8b 45 fc mov     eax, DWORD PTR _this$[ebp]
215 00012 8b e5 mov     esp, ebp
216 00014 5d pop     ebp
217 00015 c2 04 00 ret     4
218 ??0SingletonClass@@AAEH@Z ENDP ; SingletonClass::Single
tonClass
219 _TEXT ENDS
220 END

```