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## ObjectImplementation.txt

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```

1 #include <iostream>
2 using namespace std;
3
4 class A
5 {
6     public:
7         int i1;
8         char c1;
9         short s1;
10        long l1;
11
12        A() {
13            i1 = 3;
14            c1 = 4;
15            s1 = 5;
16            l1 = 6;
17        }
18
19        void f(int x) {
20            i1 += x;
21            c1 += x * 2;
22            s1 += x + 3;
23            l1 += x - 5;
24        }
25    };
26
27    int main()
28    {
29        A *ap1 = new A();
30        A *ap2 = new A();
31        ap1->f(3);
32        ap2->f(5);
33
34        return 0;
35    }
36

```

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37 ; Listing generated by Microsoft (R) Optimizing Compiler Version 19.12.25834.0
38
39         TITLE      c:\K-State\cis450\Programs\C++\ObjectImplementation.cpp
40         .686P
41         .XMM
42         include listing.inc
43         .model      flat
44
45     INCLUDELIB  LIBCMT
46     INCLUDELIB  OLDNAMES
47
48     PUBLIC  ??0A@@QAE@XZ                      ; A::A
49     PUBLIC  ?f@A@@QAE@XZ                       ; A::f
50     PUBLIC  _main
51     EXTRN   ??2@YAPAXI@Z:PROC                  ; operator new
52 ; Function compile flags: /Odtp
53 ; File c:\k-state\cis450\programs\c++\objectimplementation.cpp
54 _TEXT     SEGMENT
55     _ap2$ = -24                                ; size = 4
56     _ap1$ = -20                                ; size = 4
57     tv81 = -16                                 ; size = 4
58     $T1 = -12                                  ; size = 4
59     tv72 = -8                                  ; size = 4
60     $T2 = -4                                   ; size = 4
61     _main  PROC
62
63 ; 28      : {
64
65     00000 55                                push    ebp
66     00001 8b ec                            mov     ebp, esp
67     00003 83 ec 18                        sub     esp, 24                ; 00000018H
68
69 ; 29      :      A *ap1 = new A();
70
71     00006 6a 0c                            push    12                    ; 0000000cH
72     00008 e8 00 00 00 00                call    ??2@YAPAXI@Z          ; operator new
73     0000d 83 c4 04                        add     esp, 4
74     00010 89 45 fc                        mov     DWORD PTR $T2[ebp], eax
75     00013 83 7d fc 00                    cmp     DWORD PTR $T2[ebp], 0
76     00017 74 0d                            je      SHORT $LN3@main
77     00019 8b 4d fc                        mov     ecx, DWORD PTR $T2[ebp]
78     0001c e8 00 00 00 00                call    ??0A@@QAE@XZ          ; A::A
79     00021 89 45 f8                        mov     DWORD PTR tv72[ebp], eax
80     00024 eb 07                            jmp     SHORT $LN4@main
81 $LN3@main:
82     00026 c7 45 f8 00 00                mov     DWORD PTR tv72[ebp], 0
83     00 00
84 $LN4@main:
85     0002d 8b 45 f8                        mov     eax, DWORD PTR tv72[ebp]
86     00030 89 45 ec                        mov     DWORD PTR _ap1$[ebp], eax
87
88 ; 30      :      A *ap2 = new A();
89
90     00033 6a 0c                            push    12                    ; 0000000cH
91     00035 e8 00 00 00 00                call    ??2@YAPAXI@Z          ; operator new
92     0003a 83 c4 04                        add     esp, 4
93     0003d 89 45 f4                        mov     DWORD PTR $T1[ebp], eax
94     00040 83 7d f4 00                    cmp     DWORD PTR $T1[ebp], 0
95     00044 74 0d                            je      SHORT $LN5@main
96     00046 8b 4d f4                        mov     ecx, DWORD PTR $T1[ebp]
97     00049 e8 00 00 00 00                call    ??0A@@QAE@XZ          ; A::A
98     0004e 89 45 f0                        mov     DWORD PTR tv81[ebp], eax
99     00051 eb 07                            jmp     SHORT $LN6@main
100 $LN5@main:
101     00053 c7 45 f0 00 00                mov     DWORD PTR tv81[ebp], 0
102     00 00
103 $LN6@main:
104     0005a 8b 4d f0                        mov     ecx, DWORD PTR tv81[ebp]
105     0005d 89 4d e8                        mov     DWORD PTR _ap2$[ebp], ecx
106
107 ; 31      :      ap1->f(3);
108
109     00060 6a 03                            push    3

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110	00062 8b 4d ec	mov ecx, DWORD PTR _ap1\$[ebp]
111	00065 e8 00 00 00 00	call ?f@A@@QAEHX@Z ; A::f
112		
113	; 32 : ap2->f(5);	
114		
115	0006a 6a 05	push 5
116	0006c 8b 4d e8	mov ecx, DWORD PTR _ap2\$[ebp]
117	0006f e8 00 00 00 00	call ?f@A@@QAEHX@Z ; A::f
118		
119	; 33 :	
120	; 34 : return 0;	
121		
122	00074 33 c0	xor eax, eax
123		
124	; 35 : }	
125		
126	00076 8b e5	mov esp, ebp
127	00078 5d	pop ebp
128	00079 c3	ret 0
129	_main ENDP	
130	_TEXT ENDS	
131	; Function compile flags: /Odtp	
132	; File c:\k-state\cis450\programs\c++\objectimplementation.cpp	
133	; COMDAT ?f@A@@QAEHX@Z	
134	_TEXT SEGMENT	
135	_this\$ = -4	; size = 4
136	_x\$ = 8	; size = 4
137	?f@A@@QAEHX@Z PROC	; A::f, COMDAT
138	; _this\$ = ecx	
139		
140	; 19 : void f(int x) {	
141		
142	00000 55	push ebp
143	00001 8b ec	mov ebp, esp
144	00003 51	push ecx
145	00004 89 4d fc	mov DWORD PTR _this\$[ebp], ecx
146		
147	; 20 : il += x;	
148		
149	00007 8b 45 fc	mov eax, DWORD PTR _this\$[ebp]
150	0000a 8b 08	mov ecx, DWORD PTR [eax]
151	0000c 03 4d 08	add ecx, DWORD PTR _x\$[ebp]
152	0000f 8b 55 fc	mov edx, DWORD PTR _this\$[ebp]
153	00012 89 0a	mov DWORD PTR [edx], ecx
154		
155	; 21 : c1 += x * 2;	
156		
157	00014 8b 45 fc	mov eax, DWORD PTR _this\$[ebp]
158	00017 0f be 48 04	movsx ecx, BYTE PTR [eax+4]
159	0001b 8b 55 08	mov edx, DWORD PTR _x\$[ebp]
160	0001e 8d 04 51	lea eax, DWORD PTR [ecx+edx*2]
161	00021 8b 4d fc	mov ecx, DWORD PTR _this\$[ebp]
162	00024 88 41 04	mov BYTE PTR [ecx+4], al
163		
164	; 22 : s1 += x + 3;	
165		
166	00027 8b 55 fc	mov edx, DWORD PTR _this\$[ebp]
167	0002a 0f bf 42 06	movsx eax, WORD PTR [edx+6]
168	0002e 8b 4d 08	mov ecx, DWORD PTR _x\$[ebp]
169	00031 8d 54 08 03	lea edx, DWORD PTR [eax+ecx+3]
170	00035 8b 45 fc	mov eax, DWORD PTR _this\$[ebp]
171	00038 66 89 50 06	mov WORD PTR [eax+6], dx
172		
173	; 23 : l1 += x - 5;	
174		
175	0003c 8b 4d fc	mov ecx, DWORD PTR _this\$[ebp]
176	0003f 8b 51 08	mov edx, DWORD PTR [ecx+8]
177	00042 8b 45 08	mov eax, DWORD PTR _x\$[ebp]
178	00045 8d 4c 10 fb	lea ecx, DWORD PTR [eax+edx-5]
179	00049 8b 55 fc	mov edx, DWORD PTR _this\$[ebp]
180	0004c 89 4a 08	mov DWORD PTR [edx+8], ecx
181		
182	; 24 : }	

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183		
184	0004f 8b e5	mov esp, ebp
185	00051 5d	pop ebp
186	00052 c2 04 00	ret 4
187	?f@A@@QAEHX@Z ENDP	
188	_TEXT ENDS	; A::f
189	; Function compile flags: /Odtp	
190	; File c:\k-state\cis450\programs\c++\objectimplementation.cpp	
191	; COMDAT ??0A@@QAE@XZ	
192	_TEXT SEGMENT	
193	_this\$ = -4	; size = 4
194	??0A@@QAE@XZ PROC	; A::A, COMDAT
195	; _this\$ = ecx	
196		
197	; 12 : A() {	
198		
199	00000 55	push ebp
200	00001 8b ec	mov ebp, esp
201	00003 51	push ecx
202	00004 89 4d fc	mov DWORD PTR _this\$[ebp], ecx
203		
204	; 13 : il = 3;	
205		
206	00007 8b 45 fc	mov eax, DWORD PTR _this\$[ebp]
207	0000a c7 00 03 00 00	
208	00	mov DWORD PTR [eax], 3
209		
210	; 14 : c1 = 4;	
211		
212	00010 8b 4d fc	mov ecx, DWORD PTR _this\$[ebp]
213	00013 c6 41 04 04	mov BYTE PTR [ecx+4], 4
214		
215	; 15 : s1 = 5;	
216		
217	00017 ba 05 00 00 00	mov edx, 5
218	0001c 8b 45 fc	mov eax, DWORD PTR _this\$[ebp]
219	0001f 66 89 50 06	mov WORD PTR [eax+6], dx
220		
221	; 16 : l1 = 6;	
222		
223	00023 8b 4d fc	mov ecx, DWORD PTR _this\$[ebp]
224	00026 c7 41 08 06 00	
225	00 00	mov DWORD PTR [ecx+8], 6
226		
227	; 17 : }	
228		
229	0002d 8b 45 fc	mov eax, DWORD PTR _this\$[ebp]
230	00030 8b e5	mov esp, ebp
231	00032 5d	pop ebp
232	00033 c3	ret 0
233	??0A@@QAE@XZ ENDP	; A::A
234	_TEXT ENDS	
235	END	