```
1   #include <iostream>
2   using namespace std;
3
4   class A
5   {
6   public:
7           int i;
8           short s;
9
10          A() { i = 0; s = 0; }
11          A(int i, short s) { this->i = i; this->s = s; }
12  };
13
14  void main()
15  {
16          A *ap1 = new A();
17          A *ap2 = new A(1, 3);
18          A a1;
19          A a2(2, 6);
20          //char dummy;
21
22          //cout << "ap1->i = " << ap1->i << ",  ap1->s = " << ap1->s << "\n";
23          //cout << "ap2->i = " << ap2->i << ",  ap2->s = " << ap2->s << "\n";
24          //cout << "a1.i = " << a1.i << ",  a1.s = " << a1.s << "\n";
25          //cout << "a2.i = " << a2.i << ",  a2.s = " << a2.s << "\n";
26          //cin >> dummy;
27  }
28
```

```
29  ; Listing generated by Microsoft (R) Optimizing Compiler Version 19.24.28316.0
30
31          TITLE   c:\K-State\cis450\CoursePrograms\CS450_course_load\MMPrograms\Ch
    ap1_2\CPP\NewOperation\NewOperation.cpp
32          .686P
33          .XMM
34          include listing.inc
35          .model  flat
36
37  INCLUDELIB LIBCMT
38  INCLUDELIB OLDNAMES
39
40  PUBLIC  ??0A@@QAE@XZ                                      ; A::A
41  PUBLIC  ??0A@@QAE@HF@Z                                    ; A::A
42  PUBLIC  _main
43  EXTRN   ??2@YAPAXI@Z:PROC                                 ; operator new
44  ; Function compile flags: /Odtp
45  ; File c:\K-State\cis450\CoursePrograms\CS450_course_load\MMPrograms\Chap1_2\CPP
    \NewOperation\NewOperation.cpp
46  _TEXT   SEGMENT
47  _a2$ = -40                                                ; size = 8
48  _a1$ = -32                                                ; size = 8
49  _ap2$ = -24                                               ; size = 4
50  _ap1$ = -20                                               ; size = 4
51  tv83 = -16                                                ; size = 4
52  $T1 = -12                                                 ; size = 4
53  tv72 = -8                                                 ; size = 4
54  $T2 = -4                                                  ; size = 4
55  _main   PROC
56
57  ; 15   : {
58
59    00000 55            push    ebp
60    00001 8b ec         mov     ebp, esp
61    00003 83 ec 28      sub     esp, 40                     ; 00000028H
62
63  ; 16   :        A *ap1 = new A();
64
65    00006 6a 08         push    8
66    00008 e8 00 00 00 00 call    ??2@YAPAXI@Z               ; operator new
67    0000d 83 c4 04      add     esp, 4
68    00010 89 45 fc      mov     DWORD PTR $T2[ebp], eax
69    00013 83 7d fc 00   cmp     DWORD PTR $T2[ebp], 0
70    00017 74 0d         je      SHORT $LN3@main
71    00019 8b 4d fc      mov     ecx, DWORD PTR $T2[ebp]
72    0001c e8 00 00 00 00 call    ??0A@@QAE@XZ               ; A::A
73    00021 89 45 f8      mov     DWORD PTR tv72[ebp], eax
74    00024 eb 07         jmp     SHORT $LN4@main
75  $LN3@main:
76    00026 c7 45 f8 00 00
77          00 00         mov     DWORD PTR tv72[ebp], 0
78  $LN4@main:
79    0002d 8b 45 f8      mov     eax, DWORD PTR tv72[ebp]
80    00030 89 45 ec      mov     DWORD PTR _ap1$[ebp], eax
81
82  ; 17   :        A *ap2 = new A(1, 3);
83
84    00033 6a 08         push    8
85    00035 e8 00 00 00 00 call    ??2@YAPAXI@Z               ; operator new
86    0003a 83 c4 04      add     esp, 4
87    0003d 89 45 f4      mov     DWORD PTR $T1[ebp], eax
88    00040 83 7d f4 00   cmp     DWORD PTR $T1[ebp], 0
89    00044 74 11         je      SHORT $LN5@main
90    00046 6a 03         push    3
91    00048 6a 01         push    1
92    0004a 8b 4d f4      mov     ecx, DWORD PTR $T1[ebp]
93    0004d e8 00 00 00 00 call    ??0A@@QAE@HF@Z             ; A::A
94    00052 89 45 f0      mov     DWORD PTR tv83[ebp], eax
95    00055 eb 07         jmp     SHORT $LN6@main
96  $LN5@main:
97    00057 c7 45 f0 00 00
98          00 00         mov     DWORD PTR tv83[ebp], 0
99  $LN6@main:
```

```
100    0005e 8b 4d f0        mov      ecx, DWORD PTR tv83[ebp]
101    00061 89 4d e8        mov      DWORD PTR _ap2$[ebp], ecx
102
103  ; 18   :          A a1;
104
105    00064 8d 4d e0        lea      ecx, DWORD PTR _a1$[ebp]
106    00067 e8 00 00 00 00  call     ??0A@@QAE@XZ            ; A::A
107
108  ; 19   :          A a2(2, 6);
109
110    0006c 6a 06           push     6
111    0006e 6a 02           push     2
112    00070 8d 4d d8        lea      ecx, DWORD PTR _a2$[ebp]
113    00073 e8 00 00 00 00  call     ??0A@@QAE@HF@Z          ; A::A
114
115  ; 20   :          //char dummy;
116  ; 21   :
117  ; 22   :          //cout << "ap1->i = " << ap1->i << ",  ap1->s = " << ap1->s << "
     \n";
118  ; 23   :          //cout << "ap2->i = " << ap2->i << ",  ap2->s = " << ap2->s << "
     \n";
119  ; 24   :          //cout << "a1.i = " << a1.i << ",  a1.s = " << a1.s << "\n";
120  ; 25   :          //cout << "a2.i = " << a2.i << ",  a2.s = " << a2.s << "\n";
121  ; 26   :          //cin >> dummy;
122  ; 27   : }
123
124    00078 33 c0           xor      eax, eax
125    0007a 8b e5           mov      esp, ebp
126    0007c 5d              pop      ebp
127    0007d c3              ret      0
128  _main   ENDP
129  _TEXT   ENDS
130  ; Function compile flags: /Odtp
131  ; File c:\K-State\cis450\CoursePrograms\CS450_course_load\MMPrograms\Chap1_2\CPP
     \NewOperation\NewOperation.cpp
132  ;       COMDAT ??0A@@QAE@HF@Z
133  _TEXT   SEGMENT
134  _this$ = -4                                    ; size = 4
135  _i$ = 8                                         ; size = 4
136  _s$ = 12                                        ; size = 2
137  ??0A@@QAE@HF@Z PROC                             ; A::A, COMDAT
138  ; _this$ = ecx
139
140  ; 11   :          A(int i, short s) { this->i = i; this->s = s; }
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$[ebp], ecx
146    00007 8b 45 fc        mov      eax, DWORD PTR _this$[ebp]
147    0000a 8b 4d 08        mov      ecx, DWORD PTR _i$[ebp]
148    0000d 89 08           mov      DWORD PTR [eax], ecx
149    0000f 8b 55 fc        mov      edx, DWORD PTR _this$[ebp]
150    00012 66 8b 45 0c     mov      ax, WORD PTR _s$[ebp]
151    00016 66 89 42 04     mov      WORD PTR [edx+4], ax
152    0001a 8b 45 fc        mov      eax, DWORD PTR _this$[ebp]
153    0001d 8b e5           mov      esp, ebp
154    0001f 5d              pop      ebp
155    00020 c2 08 00        ret      8
156  ??0A@@QAE@HF@Z ENDP                             ; A::A
157  _TEXT   ENDS
158  ; Function compile flags: /Odtp
159  ; File c:\K-State\cis450\CoursePrograms\CS450_course_load\MMPrograms\Chap1_2\CPP
     \NewOperation\NewOperation.cpp
160  ;       COMDAT ??0A@@QAE@XZ
161  _TEXT   SEGMENT
162  _this$ = -4                                    ; size = 4
163  ??0A@@QAE@XZ PROC                               ; A::A, COMDAT
164  ; _this$ = ecx
165
166  ; 10   :          A() { i = 0; s = 0; }
167
168    00000 55              push     ebp
```

```
169    00001 8b ec           mov      ebp, esp
170    00003 51              push     ecx
171    00004 89 4d fc        mov      DWORD PTR _this$[ebp], ecx
172    00007 8b 45 fc        mov      eax, DWORD PTR _this$[ebp]
173    0000a c7 00 00 00 00 00
174          00              mov      DWORD PTR [eax], 0
175    00010 33 c9           xor      ecx, ecx
176    00012 8b 55 fc        mov      edx, DWORD PTR _this$[ebp]
177    00015 66 89 4a 04     mov      WORD PTR [edx+4], cx
178    00019 8b 45 fc        mov      eax, DWORD PTR _this$[ebp]
179    0001c 8b e5           mov      esp, ebp
180    0001e 5d              pop      ebp
181    0001f c3              ret      0
182  ??0A@@QAE@XZ ENDP                                         ; A::A
183  _TEXT   ENDS
184  END
```