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fact.txt

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```

1  /*//////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
2  //      fact.c program to test a recursive call in C
3  //      M. Mizuno (c) 1995, 2004, 2005
4  //      modified for Learning Tree course 223P
5  /*//////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////
6  /* Draw memory image of execution of the following program */
7  int ans;
8
9  void fact(int i)
10 {
11     /* what will happen if x is declared as internal static */
12     int x;
13
14     x = i - 1;
15     if ((i == 0) || (x == 0)) ans = 1;
16     else {
17         fact(x);
18         ans = (x + 1) * ans;
19     }
20 }
21
22 int main(void)
23 {
24     fact(3);
25     printf("answer = %d\n", ans);
26     return 0;
27 }
28

```

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```

29 .sect .text; .sect .rom; .sect .data; .sect .bss
30 .extern _fact
31 .sect .text
32 _fact:
33 push ebp
34 mov ebp,esp
35 push esi
36 mov edx,8(ebp)
37 dec edx
38 mov esi,edx
39 cmp 8(ebp),0
40 je I1_3
41 test esi,esi
42 jne I1_4
43 I1_3:
44 mov (_ans),1
45 jmp I1_1
46 I1_4:
47 push esi
48 call _fact
49 pop ecx
50 mov edx,esi
51 inc edx
52 imul edx,(_ans)
53 mov (_ans),edx
54 I1_1:
55 pop esi
56 leave
57 ret
58 .extern _main
59 _main:
60 push ebp
61 mov ebp,esp
62 push 3
63 call _fact
64 pop ecx
65 push (_ans)
66 push I_1
67 call _printf
68 pop ecx
69 pop ecx
70 xor eax,eax
71 leave
72 ret
73 .sect .rom
74 I_1:
75 .data4 1936618337
76 .data4 544367991
77 .data4 1680154685
78 .extern _ans
79 .data4 10
80 .sect .bss
81 .comm _ans,4
82 .sect .text

```