auth.g (graph)

27 28 8 40c25cd010a:0 0x40C25CD: getc (getc.c:39) (result)
28 29 8 40c25bf010a:0 0x40C25BC: getc (getc.c:42) (result)
29 30 8 8048529010a:0 0x8048529: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
30 31 8 80485290214:0 0x8048529: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
31 32 8 8048529020b:0 0x8048529: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
32 33 8 80485290314:0 0x8048529: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
33 34 8 8048529030b:0 0x8048529: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
28 35 8 8048529040a:0 0x8048529: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
35 36 8 80485290502:0 0x8048529: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (binary arg 2)
34 38 8 80485290602:0 0x8048529: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (binary arg 2)
38 39 8 8048529060b:0 0x8048529: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
39 40 8 804852b0314:0 0x804852B: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
40 41 8 804852b030b:0 0x804852B: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
41 42 8 804852e020b:0 0x804852E: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
42 43 8 804852e0314:0 0x804852E: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
43 44 32 804852e030b:0 0x804852E: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
44 45 32 80484c3010a:8048535 0x80484C3: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
44 46 8 80484c4020b:8048535 0x80484C4: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
46 47 8 80484c40314:8048535 0x80484C4: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
47 48 8 80484c4030b:8048535 0x80484C4: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
48 49 8 80484c4040a:8048535 0x80484C4: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
45 50 32 80484c40502:8048535 0x80484C4: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (binary arg 2)
50 51 24 80484c4050b:8048535 0x80484C4: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
51 52 24 80484c40601:8048535 0x80484C4: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (binary arg 1)
49 52 8 80484c40602:8048535 0x80484C4: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (binary arg 2)
52 53 32 80484c4060b:8048535 0x80484C4: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
53 54 32 80484c70214:8048535 0x80484C7: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
54 55 8 80484c7020b:8048535 0x80484C7: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
55 56 8 80484c7030a:8048535 0x80484C7: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
56 57 8 80484ca020b:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
57 58 8 80484ca0314:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
58 59 32 80484ca030b:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
59 60 32 80484ca040a:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
60 61 32 80484d10101:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (binary arg 1)
61 62 1 80484d1010b:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
62 63 1 80484d10214:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
63 64 1 80484d1020b:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
64 65 1 80484d1030a:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
65 66 1 80484d10414:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
66 67 1 80484d1040b:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
67 68 1 80484d1050a:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
68 69 1 80484d10614:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
69 70 1 80484d1060b:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
70 71 1 80484d1070a:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
71 72 1 80484d10814:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
72 73 1 80484d1080b:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
73 74 1 80484d1090a:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
53 75 32 80484d10a02:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (binary arg 2)
75 76 24 80484d10a0b:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
76 77 24 80484d10b01:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (binary arg 1)
74 77 1 80484d10b02:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (binary arg 2)
77 78 25 80484d10b0b:8048535 0x80484CA: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
78 79 25 80484d40114:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
79 80 1 80484d4010b:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
80 81 1 80484d4020a:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
81 82 1 80484d40301:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (binary arg 1)
82 83 1 80484d4030b:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
83 84 1 80484d40514:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
84 85 1 80484d4050b:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
85 86 1 80484d4060a:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
78 87 25 80484d40702:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (binary arg 2)
87 88 24 80484d4070b:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
88 89 24 80484d40801:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (binary arg 1)
86 89 1 80484d40802:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (binary arg 2)
89 90 25 80484d4080b:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
90 91 25 80484d60114:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
91 92 1 80484d6010b:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
92 93 1 80484d6020a:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
93 94 1 80484d60314:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
94 95 1 80484d6030b:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
95 96 1 80484d6040a:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)

96 97 **1** **80484dd**0114:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
97 98 **1** **80484dd**010b:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
98 99 **1** **80484dd**020a:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
99 100 **1** **80484df**0114:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
100 101 **1** **80484df**010b:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
101 102 **1** **80484df**020a:8048535 0x80484DC: auth (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
-- (call boundary) --
102 103 1 804853a010a:0 0x804853A: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
103 104 1 804853d0101:0 0x804853D: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (binary arg 1)
104 105 1 804853d010b:0 0x804853D: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
105 106 1 804853d0214:0 0x804853D: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
106 107 1 804853d020b:0 0x804853D: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
107 108 1 804853d030a:0 0x804853D: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
108 109 1 804853d0414:0 0x804853D: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (unary)
109 110 1 804853d040b:0 0x804853D: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
110 111 1 804853d050a:0 0x804853D: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (result)
111 24 1 804853d0600:0 0x804853D: main (in /home/sxl463/working/flowcheck/flowcheck/test/auth/addecx/auth) (global leak)

C code:

```c
int auth(char c){
  return c == 'a';
}

int main() {
    FILE *fp;
    char* filename = "password.txt";

    fp = fopen(filename, "r");
    char input = fgetc(fp);//read a char from the file

    if(auth(input))
      printf("YES\n");
    else
      printf("NO\n");

    fclose(fp);
    return 0;
}
```

objdump:

```
080484c0 <auth>:
 80484c0:55                    push  %ebp
 80484c1:89 e5                 mov   %esp,%ebp
 80484c3:50                    push  %eax
 80484c4:8a 45 08              mov   0x8(%ebp),%al
 80484c7:88 45 ff              mov   %al,-0x1(%ebp)
 80484ca:0f be 4d ff           movsbl -0x1(%ebp),%ecx
 80484ce:83 f9 61              cmp   $0x61,%ecx
 80484d1:0f 94 c0              sete  %al
 80484d4:24 01                 and   $0x1,%al
 80484d6:0f b6 c0              movzbl %al,%eax
 80484d9:83 c4 04              add   $0x4,%esp
 80484dc:5d                    pop   %ebp
 80484dd:f7 d0                 not   %eax
 80484df:f7 d0                 not   %eax
 80484e1:c3                    ret
 80484e2:66 66 66 66 66 2e 0f          data32 data32 data32 data32 nopw %cs:0x0(%eax,%eax,1)
 80484e9:1f 84 00 00 00 00 00

080484f0 <main>:
 80484f0:           55                  push  %ebp
 80484f1:           89 e5               mov   %esp,%ebp
 80484f3:           83 ec 28            sub   $0x28,%esp
 80484f6:           8d 05 2d 86 04 08   lea   0x804862d,%eax
 80484fc:           8d 0d 20 86 04 08   lea   0x8048620,%ecx
 8048502:           c7 45 fc 00 00 00 00 movl  $0x0,-0x4(%ebp)
 8048509:           89 4d f4            mov   %ecx,-0xc(%ebp)
 804850c:           8b 4d f4            mov   -0xc(%ebp),%ecx
 804850f:           89 0c 24            mov   %ecx,(%esp)
 8048512:           89 44 24 04         mov   %eax,0x4(%esp)
 8048516:           e8 75 fe ff ff      call  8048390 <fopen@plt>
 804851b:           89 45 f8            mov   %eax,-0x8(%ebp)
 804851e:           8b 45 f8            mov   -0x8(%ebp),%eax
 8048521:           89 04 24            mov   %eax,(%esp)
 8048524:           e8 77 fe ff ff      call  80483a0 <fgetc@plt>
 8048529:           88 c2               mov   %al,%dl
 804852b:           88 55 f3            mov   %dl,-0xd(%ebp)
 804852e:           0f be 45 f3         movsbl -0xd(%ebp),%eax
 8048532:           89 04 24            mov   %eax,(%esp)
 8048535:           e8 86 ff ff ff      call  80484c0 <auth>
 804853a:           83 f8 00            cmp   $0x0,%eax
 804853d:           74 13               je    8048552 <main+0x62>
 804853f:           8d 05 2f 86 04 08   lea   0x804862f,%eax
 8048545:           89 04 24            mov   %eax,(%esp)
 8048548:           e8 13 fe ff ff      call  8048360 <printf@plt>
 804854d:           89 45 ec            mov   %eax,-0x14(%ebp)
 8048550:           eb 11               jmp   8048563 <main+0x73>
 8048552:           8d 05 34 86 04 08          lea   0x8048634,%eax
 8048558:           89 04 24            mov   %eax,(%esp)
 804855b:           e8 00 fe ff ff      call  8048360 <printf@plt>
 8048560:           89 45 e8            mov   %eax,-0x18(%ebp)
 8048563:           8b 45 f8            mov   -0x8(%ebp),%eax
 8048566:           89 04 24            mov   %eax,(%esp)
 8048569:           e8 02 fe ff ff      call  8048370 <fclose@plt>
 804856e:           b9 00 00 00 00      mov   $0x0,%ecx
 8048573:           89 45 e4            mov   %eax,-0x1c(%ebp)
 8048576:           89 c8               mov   %ecx,%eax
 8048578:           83 c4 28            add   $0x28,%esp
 804857b:           5d                  pop   %ebp
 804857c:           f7 d0               not   %eax
 804857e:           f7 d0               not   %eax
 8048580:           c3                  ret
 8048581:           66 90               xchg  %ax,%ax
 8048583:           66 90               xchg  %ax,%ax
 8048585:           66 90               xchg  %ax,%ax
 8048587:           66 90               xchg  %ax,%ax
 8048589:           66 90               xchg  %ax,%ax
 804858b:           66 90               xchg  %ax,%ax
 804858d:           66 90               xchg  %ax,%ax
 804858f:90                  nop
```