0x281

```c
8  simplenote.c
9
10  #include <stdio.h>
11  #include <stdlib.h>
12  #include <string.h>
13  #include <fcntl.h>
14  #include <sys/stat.h>
15  void usage(char *prog_name, char *filename) {
16      printf("Usage: %s <data to add to %s>\n", prog_name, filename);
17      exit(0);
18  }
19  void fatal(char *);
20  // A function for fatal errors
21  void *ec_malloc(unsigned int); // An error-checked malloc() wrapper
22  int main(int argc, char *argv[]) {
23      int fd; // file descriptor
24      char *buffer, *datafile;
25      buffer = (char *) ec_malloc(100);
26      datafile = (char *) ec_malloc(20);
27      strcpy(datafile, "/tmp/notes");
28      if(argc < 2)
29
30          // If there aren't command-line arguments,
31          usage(argv[0], datafile); // display usage message and exit.
32      strcpy(buffer, argv[1]);   // Copy into buffer.
33      printf("[DEBUG] buffer
34      @
35  %p: \'%s\'\n", buffer, buffer);
36      printf("[DEBUG] datafile @ %p: \'%s\'\n", datafile, datafile);
37      strncat(buffer, "\n", 1); // Add a newline on the end.
38      // Opening file
39      fd = open(datafile, O_WRONLY|O_CREAT|O_APPEND, S_IRUSR|S_IWUSR);
40      if(fd == -1)
41          fatal("in main() while opening file");
42      printf("[DEBUG] file descriptor is %d\n", fd);
43      // Writing data
44      if(write(fd, buffer, strlen(buffer)) == -1)
45          fatal("in main() while writing buffer to file");
46      // Closing file
47      if(close(fd) == -1)
```

Output:

```
Main.c:8:11: error: expected '=', ',', ';', 'asm' or '__attribute__' before
    8 | simplenote.c
      |           ^
In file included from /usr/include/stdio.h:44,
                 from Main.c:10:
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:95:3: error: unknown
   95 |   size_t __pad5;
      |   ^~~~~~
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:98:67: error: 'size
   98 |   char _unused2[15 * sizeof (int) - 4 * sizeof (void *) - sizeof (s
      |
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:1:1: note: 'size_t'
  +++ |+#include <stddef.h>
    1 | /* Copyright (C) 1991-2024 Free Software Foundation, Inc.
In file included from /usr/include/stdio.h:47:
/usr/include/x86_64-linux-gnu/bits/types/cookie_io_functions_t.h:28:43: err
   28 |                                        size_t __nbytes);
      |                                        ^~~~~~
/usr/include/x86_64-linux-gnu/bits/types/cookie_io_functions_t.h:37:44: err
   37 |                                        size_t __nbytes);
      |                                        ^~~~~~
/usr/include/x86_64-linux-gnu/bits/types/cookie_io_functions_t.h:57:3: erro
   57 |   cookie_read_function_t *read;        /* Read bytes.  */
      |   ^~~~~~~~~~~~~~~~~~~~~~
/usr/include/x86_64-linux-gnu/bits/types/cookie_io_functions_t.h:58:3: erro
```

0x281 pt2

```c
7
8  bitwise.c
9
10  #include <stdio.h>
11  int main() {
12      int i, bit_a, bit_b;
13
14      printf("bitwise OR operator   |\n");
15      for(i=0; i < 4; i++) {
16          bit_a = (i & 2) / 2; // Get the second bit.
17          bit_b = (i & 1);
18          // Get the first bit.
19          printf("%d | %d = %d\n", bit_a, bit_b, bit_a | bit_b);
20      }
21      printf("\nbitwise AND operator  &\n");
22      for(i=0; i < 4; i++) {
23          bit_a = (i & 2) / 2; // Get the second bit.
24          bit_b = (i & 1);
25          // Get the first bit.
26          printf("%d & %d = %d\n", bit_a, bit_b, bit_a & bit_b);
27      }
28  }
```

Output:

```
Main.c:8:8: error: expected '=', ',', ';', 'asm' or '__attribute__' be
    8 | bitwise.c
      |        ^
In file included from /usr/include/stdio.h:44,
                 from Main.c:10:
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:95:3: error: un
   95 |   size_t __pad5;
      |   ^~~~~~
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:98:67: error: '
   98 |   char _unused2[15 * sizeof (int) - 4 * sizeof (void *) - size
      |
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:1:1: note: 'siz
  +++ |+#include <stddef.h>
    1 | /* Copyright (C) 1991-2024 Free Software Foundation, Inc.
In file included from /usr/include/stdio.h:47:
/usr/include/x86_64-linux-gnu/bits/types/cookie_io_functions_t.h:28:43
   28 |                                        size_t __nbytes);
      |                                        ^~~~~~
/usr/include/x86_64-linux-gnu/bits/types/cookie_io_functions_t.h:37:44
   37 |                                        size_t __nbytes);
```

0x281 pt3

```c
8  fcntl_flags.c
9
10  #include <stdio.h>
11  #include <fcntl.h>
12  void display_flags(char *, unsigned int);
13  void binary_print(unsigned int);
14  int main(int argc, char *argv[]) {
15      display_flags("O_RDONLY\t\t", O_RDONLY);
16      display_flags("O_WRONLY\t\t", O_WRONLY);
17      display_flags("O_RDWR\t\t", O_RDWR);
18      printf("\n");
19      display_flags("O_APPEND\t\t", O_APPEND);
20      display_flags("O_TRUNC\t\t", O_TRUNC);
21      display_flags("O_CREAT\t\t", O_CREAT);
22      85
23      Programming
24
25      printf("\n");
26      display_flags("O_WRONLY|O_APPEND|O_CREAT", O_WRONLY|O_APPEND|O_CREAT);
27  }
28  void display_flags(char *label, unsigned int value) {
29      printf("%s\t: %d\t:", label, value);
30      binary_print(value);
31      printf("\n");
32  }
33  void binary_print(unsigned int value) {
34      unsigned int mask = 0xff000000; // Start with a mask for the highest byte.
35      unsigned int shift = 256*256*256; // Start with a shift for the highest byte.
36      unsigned int byte, byte_iterator, bit_iterator;
37      for(byte_iterator=0; byte_iterator < 4; byte_iterator++) {
38          byte = (value & mask) / shift; // Isolate each byte.
39          printf(" ");
40          for(bit_iterator=0; bit_iterator < 8; bit_iterator++) { // Print the byte's bits.
41              if(byte & 0x80) // If the highest bit in the byte isn't 0,
42                  printf("1");       // print a 1.
43              else
44                  printf("0");       // Otherwise, print a 0.
45              byte *= 2;         // Move all the bits to the left by 1.
```

Input for the program (Optional)

Output:

```
Main.c:8:12: error: expected '=', ',', ';
    8 | fcntl_flags.c
      |            ^
In file included from /usr/include/stdio.
                 from Main.c:10:
/usr/include/x86_64-linux-gnu/bits/types/
   95 |   size_t __pad5;
      |   ^~~~~~
/usr/include/x86_64-linux-gnu/bits/types/
   98 |   char _unused2[15 * sizeof (int)
      |
/usr/include/x86_64-linux-gnu/bits/types/
  +++ |+#include <stddef.h>
    1 | /* Copyright (C) 1991-2024 Free S
In file included from /usr/include/stdio.
/usr/include/x86_64-linux-gnu/bits/types/
   28 |
      |
/usr/include/x86_64-linux-gnu/bits/types/
   37 |
      |
/usr/include/x86_64-linux-gnu/bits/types/
   57 |   cookie_read_function_t *read;
      |   ^~~~~~~~~~~~~~~~~~~~~~~~
```

0x282 y 0x283

```
uid_demo.c

#include <stdio.h>
int main() {
printf("real uid: %d\n", getuid());
printf("effective uid: %d\n", geteuid());
}
```

```
Main.c:8:9: error: expected '=', ',', ';', 'asm' or '__attribute__' before
    8 | uid_demo.c
      |         ^
In file included from /usr/include/stdio.h:44,
                 from Main.c:10:
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:95:3: error: unknown
   95 |   size_t __pad5;
      |   ^~~~~~
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:98:67: error: 'size_
   98 |   char _unused2[15 * sizeof (int) - 4 * sizeof (void *) - sizeof (s
      |                                                                    ^
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:1:1: note: 'size_t'
  +++ |+#include <stddef.h>
    1 | /* Copyright (C) 1991-2024 Free Software Foundation, Inc.
In file included from /usr/include/stdio.h:47:
```

```
 6
 7
 8  hacking.h
 9
10    // A function to display an error message and then exit
11 ▼  void fatal(char *message) {
12      char error_message[100];
13      strcpy(error_message, "[!!] Fatal Error ");
14      strncat(error_message, message, 83);
15      perror(error_message);
16      exit(-1);
17    }
18    // An error-checked malloc() wrapper function
19 ▼  void *ec_malloc(unsigned int size) {
20      void *ptr;
21      ptr = malloc(size);
22      if(ptr == NULL)
23      fatal("in ec_malloc() on memory allocation");
24      return ptr;
25    }
```

```
Output:

Main.c:8:8: er
    8 | hacking
      |
Main.c: In fun
Main.c:21:8: wa
   21 |   ptr =
      |
Main.c:1:1: no
  +++ |+#inclu
    1 |
Main.c:21:8: wa
   21 |   ptr =
      |
Main.c:21:8: n
Main.c:22:12: 
   22 |   if(pt
      |
Main.c:1:1: no
  +++ |+#inclu
    1 |
Main.c:22:12: 
```

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <fcntl.h>
#include <sys/stat.h>
#include "hacking.h"
void usage(char *prog_name, char *filename) {
printf("Usage: %s <data to add to %s>\n", prog_name, filename);
exit(0);

}
void fatal(char *);
// A function for fatal errors
void *ec_malloc(unsigned int); // An error-checked malloc() wrapper
int main(int argc, char *argv[]) {
int userid, fd; // File descriptor
char *buffer, *datafile;
buffer = (char *) ec_malloc(100);
datafile = (char *) ec_malloc(20);
strcpy(datafile, "/var/notes");
if(argc < 2)
// If there aren't command-line arguments,
usage(argv[0], datafile); // display usage message and exit.
strcpy(buffer, argv[1]); // Copy into buffer.
printf("[DEBUG] buffer
@
%p: \'%s\'\n", buffer, buffer);
printf("[DEBUG] datafile @ %p: \'%s\'\n", datafile, datafile);
// Opening the file
fd = open(datafile, O_WRONLY|O_CREAT|O_APPEND, S_IRUSR|S_IWUSR);
if(fd == -1)
fatal("in main() while opening file");
printf("[DEBUG] file descriptor is %d\n", fd);
userid = getuid(); // Get the real user ID.
// Writing data
if(write(fd, &userid, 4) == -1) // Write user ID before note data.
fatal("in main() while writing userid to file");
write(fd, "\n", 1); // Terminate line.
if(write(fd, buffer, strlen(buffer)) == -1) // Write note.
fatal("in main() while writing buffer to file");
```

```
Output:

Main.c:8:11: error: expected '=', ',', ';', 'asm' or '__attribute_
    8 |  notetaker.c
      |           ^
In file included from /usr/include/stdio.h:44,
                 from Main.c:10:
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:95:3: error
   95 |   size_t __pad5;
      |   ^~~~~~
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:98:67: erro
   98 |   char _unused2[15 * sizeof (int) - 4 * sizeof (void *) - 
      |
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:1:1: note:
  +++ |+#include <stddef.h>
    1 | /* Copyright (C) 1991-2024 Free Software Foundation, Inc.
In file included from /usr/include/stdio.h:47:
/usr/include/x86_64-linux-gnu/bits/types/cookie_io_functions_t.h:2
   28 |                              size_t __nbytes)
      |                              ^~~~~~
/usr/include/x86_64-linux-gnu/bits/types/cookie_io_functions_t.h:3
   37 |                              size_t __nbytes
      |                              ^~~~~~
/usr/include/x86_64-linux-gnu/bits/types/cookie_io_functions_t.h:5
   57 |   cookie_read_function_t *read;       /* Read bytes. */
      |   ^~~~~~~~~~~~~~~~~~~~~~
/usr/include/x86_64-linux-gnu/bits/types/cookie_io_functions_t.h:5
```

```
7
8
9
10   notesearch.c
11
12   #include <stdio.h>
13   #include <string.h>
14   #include <fcntl.h>
15   #include <sys/stat.h>
16   #include "hacking.h"
17
18   #define FILENAME "/var/notes"
19   int print_notes(int, int, char *);      // Note printing function.
20   int find_user_note(int, int);           // Seek in file for a note for user.
21   int search_note(char *, char *);        // Search for keyword function.
22   void fatal(char *);                     // Fatal error handler
23   int main(int argc, char *argv[]) {
24       int userid, printing=1, fd; // File descriptor
25       char searchstring[100];
26       if(argc > 1)                        // If there is an arg,
27           strcpy(searchstring, argv[1]);  //   that is the search string;
28       else                                // otherwise,
29           searchstring[0] = 0;            //   search string is empty.
30       userid = getuid();
31       fd = open(FILENAME, O_RDONLY);      // Open the file for read-only access.
32       if(fd == -1)
33           fatal("in main() while opening file for reading");
34       while(printing)
35           printing = print_notes(fd, userid, searchstring);
36       printf("-------[ end of note data ]-------\n");
37       close(fd);
38   }
39   // A function to print the notes for a given uid that match
40   // an optional search string.
41   // returns 0 at end of file, 1 if there are still more notes.
42   int print_notes(int fd, int uid, char *searchstring) {
43       int note_length;
44       char byte=0, note_buffer[100];
45       note_length = find_user_note(fd, uid);
```

Output:
```
Main.c:10:11: error: expected '=', ',', ';', 'asm' or '__attribute__' b
   10 | notesearch.c
      |           ^
In file included from /usr/include/stdio.h:44,
                 from Main.c:12:
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:95:3: error: unk
   95 |   size_t __pad5;
      |   ^~~~~~
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:98:67: error: 's
   98 |   char _unused2[15 * sizeof (int) - 4 * sizeof (void *) - sizeo
      |
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:1:1: note: 'size
  +++ |+#include <stddef.h>
    1 | /* Copyright (C) 1991-2024 Free Software Foundation, Inc.
In file included from /usr/include/stdio.h:47:
/usr/include/x86_64-linux-gnu/bits/types/cookie_io_functions_t.h:28:43:
   28 |                                         size_t __nbytes);
      |                                         ^~~~~~
/usr/include/x86_64-linux-gnu/bits/types/cookie_io_functions_t.h:37:44:
   37 |                                         size_t __nbytes);
      |                                         ^~~~~~
/usr/include/x86_64-linux-gnu/bits/types/cookie_io_functions_t.h:57:3:
   57 |   cookie_read_function_t *read;       /* Read bytes.  */
      |   ^~~~~~~~~~~~~~~~~~~~~
/usr/include/x86_64-linux-gnu/bits/types/cookie_io_functions_t.h:58:3:
```

0x286

```
7
8
9
10   rand_example.c
11
12   #include <stdio.h>
13   #include <stdlib.h>
14   int main() {
15       int i;
16       printf("RAND_MAX is %u\n", RAND_MAX);
17       srand(time(0));
18       printf("random values from 0 to RAND_MAX\n");
19       for(i=0; i < 8; i++)
20       printf("%d\n", rand());
21       printf("random values from 1 to 20\n");
22       for(i=0; i < 8; i++)
23       printf("%d\n", (rand()%20)+1);
24   }
```

Output:
```
Main.c:10:14: error: expected '=', ',', ';', 'asm' or '__attribute
   10 | rand_example.c
      |              ^
In file included from /usr/include/stdio.h:44,
                 from Main.c:12:
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:95:3: error
   95 |   size_t __pad5;
      |   ^~~~~~
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:98:67: erro
   98 |   char _unused2[15 * sizeof (int) - 4 * sizeof (void *) -
      |
/usr/include/x86_64-linux-gnu/bits/types/struct_FILE.h:1:1: note:
  +++ |+#include <stddef.h>
    1 | /* Copyright (C) 1991-2024 Free Software Foundation, Inc.
In file included from /usr/include/stdio.h:47:
/usr/include/x86_64-linux-gnu/bits/types/cookie_io_functions_t.h:2
   28 |                                         size_t __nbytes)
      |                                         ^~~~~~
/usr/include/x86_64-linux-gnu/bits/types/cookie_io_functions_t.h:3
   37 |                                         size_t __nbytes
```