

**NAME**

`fread`, `fwrite` – binary stream input/output

**SYNOPSIS**

```
#include <stdio.h>
```

```
size_t fread(void *ptr, size_t size, size_t nmemb, FILE *stream);
```

```
size_t fwrite(const void *ptr, size_t size, size_t nmemb,
              FILE *stream);
```

**DESCRIPTION**

The function `fread()` reads *nmemb* items of data, each *size* bytes long, from the stream pointed to by *stream*, storing them at the location given by *ptr*.

The function `fwrite()` writes *nmemb* items of data, each *size* bytes long, to the stream pointed to by *stream*, obtaining them from the location given by *ptr*.

For nonlocking counterparts, see `unlocked_stdio(3)`.

**RETURN VALUE**

On success, `fread()` and `fwrite()` return the number of items read or written. This number equals the number of bytes transferred only when *size* is 1. If an error occurs, or the end of the file is reached, the return value is a short item count (or zero).

The file position indicator for the stream is advanced by the number of bytes successfully read or written.

`fread()` does not distinguish between end-of-file and error, and callers must use `feof(3)` and `ferror(3)` to determine which occurred.

**ATTRIBUTES**

For an explanation of the terms used in this section, see `attributes(7)`.

Interface	Attribute	Value
<code>fread()</code> , <code>fwrite()</code>	Thread safety	MT-Safe

**CONFORMING TO**

POSIX.1-2001, POSIX.1-2008, C89.

**EXAMPLES**

The program below demonstrates the use of `fread()` by parsing `/bin/sh` ELF executable in binary mode and printing its magic and class:

```
$ ./a.out
ELF magic: 0x7f454c46
Class: 0x02
```

**Program source**

```
#include <stdio.h>
#include <stdlib.h>

#define ARRAY_SIZE(arr) (sizeof(arr) / sizeof((arr)[0]))

int
main(void)
{
    FILE *fp = fopen("/bin/sh", "rb");
    if (!fp) {
        perror("fopen");
        return EXIT_FAILURE;
    }
}
```

```
unsigned char buffer[4];

size_t ret = fread(buffer, ARRAY_SIZE(buffer), sizeof(*buffer), fp);
if (ret != sizeof(*buffer)) {
    fprintf(stderr, "fread() failed: %zu\n", ret);
    exit(EXIT_FAILURE);
}

printf("ELF magic: %#04x%02x%02x%02x\n", buffer[0], buffer[1],
       buffer[2], buffer[3]);

ret = fread(buffer, 1, 1, fp);
if (ret != 1) {
    fprintf(stderr, "fread() failed: %zu\n", ret);
    exit(EXIT_FAILURE);
}

printf("Class: %#04x\n", buffer[0]);

fclose(fp);

exit(EXIT_SUCCESS);
}
```

**SEE ALSO**

**read(2)**, **write(2)**, **feof(3)**, **ferror(3)**, **unlocked\_stdio(3)**

**COLOPHON**

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