

# Files

2025 Winter APS105: Computer Fundamentals  
Jon Eyolfson

Lecture 34  
1.0.0

## Most Programs Use Files for Input

Using files is NOT testable, however it's mostly string input

We previously saw another way to get input, from typing a command

Today, we'll see how to use files and create a program that uses them

## You Can Open Files, and Close Them When You're Done

The API to open a file that you can use is:

```
FILE *fopen(const char *pathname, const char *mode);
```

pathname is a string representing the filename to access

mode is a string representing what you want to use the file for

You can use "r" for reading the file

fopen returns a pointer to the file (NULL on failure)

The API to close a file that you're done with is:

```
int fclose(FILE *stream);
```

stream is the pointer returned from fopen

## You Should Use `getline` with Files Too

`getline` will allocate memory for you, it's API is:

```
ssize_t getline(char **bufferp, size_t *sizep, FILE *stream);
```

If you initialize the value at `bufferp` with `NULL` and `sizep` it'll `malloc` for you  
Otherwise it'll `realloc` (you must make sure `*sizep` is correct)

It will match an entire line including whitespace and the ending newline

It returns the number of characters written (excluding the null byte)

The last argument, `stream`, should be the pointer returned by `fopen`

## Reading Every Line of a grades.txt File

```
void readGrades() {
    FILE *file = fopen("grades.txt", "r");
    if (file == NULL) {
        exit(EXIT_FAILURE);
    }
    char *str = NULL;
    size_t size = 0;
    ssize_t length = 0;
    while (1) {
        length = getline(&str, &size, file);
        if (length <= 0) {
            break;
        }
        /* Use the string here */
    }
    free(str);
    fclose(file);
}
```

## We'll Develop a Grade Calculator

Let's write a program that uses a file called `grades.txt` as input

- Each line of the file is a grade on an assessment

- We expect 9 lab grades, and 1 midterm grade

We'll calculate our current course grade using the weights of this course

Next, we'll determine our minimum grade, and maximum grade

We'll finish off by calculating the final exam mark for a target grade