

CSC209 Week 5 Notes

Hyungmo Gu

May 13, 2020

Files in C 1 of 5

- Opening file

- **Syntax:** `*fopen(const char *filename, const char *mode)`
- the import file should be in the same folder as 'a.out' (default)
- Mode Strings
 1. *r* - File opened for reading
 2. *w* - File opened for writing
 3. *a* - File opened for appending

```
1  #include <stdio.h>
2
3  int main() {
4      FILE *sample_file;
5
6      sample_file = fopen("example_sources/sample.txt", "r");
7      if (sample_file == NULL) {
8          fprintf(stderr, "Error opening file \n");
9          return 1;
10     }
11
12     ...
13
14     return 0;
15 }
16
```

- Closing file

- **Syntax:** `fclose(FILE *filename)`
- returns 0 if close successful

```
1  #include <stdio.h>
2
3  int main() {
```

```
4     FILE *sample_file;
5
6     ...
7
8     if (fclose(sample_file) != 0) {
9         fprintf(stderr, "fclose failed\n");
10        return 1;
11    }
12
13    return 0;
14 }
15
```

Files in C 2 of 5

- Reading from Files

- **Syntax:** `char *fgets(char *s, int n, FILE *stream)`
- Reads data line by line
 1. *char *s* is a pointer to memory where text can be stored
 - * Note new var can be created here, like for loop (i.e. `for(i=0; i < 1; i++)`).
 - * On success, `fgets` returns *s*
 - * On failure, `fgets` returns `NULL`
 2. *int n* is the maximum upper number of characters `fgets` allowed to put in *s*

```
1  #include <stdio.h>
2
3  #define LINE_LENGTH 80
4
5  int main() {
6      FILE *sample_file;
7      int error;
8      char line[LINE_LENGTH + 1];
9
10     sample_file = fopen("example_sources/sample.txt", "r");
11
12     while (fgets(line, LINE_LENGTH + 1, sample_file) != NULL) {
13         printf("%s", line);
14     }
15
16     ...
17     return 0;
18 }
19
```

- Reading from Input

- **Syntax:** `fgets(line, LINE_LENGTH + 1, stdin)`
- Notice *stdin* is the standard input, like `input` in Python

```
1  #include <stdio.h>
2
3  #define LINE_LENGTH 80
4
5  int main() {
6      char line[LINE_LENGTH + 1];
7
8      while (fgets(line, LINE_LENGTH + 1, stdin) != NULL) {
9          printf("%s", line);
10     }
11
12     return 0;
13 }
14
```

Files in C 3 of 5

- The `scanf` function
 - returns successfully read items
 - number of read items depends on format
 - **Syntax:** `int fscanf(FILE *stream, const char *format, type *s, type *n)`

```
1  #include <stdio.h>
2
3  #define LINE_LENGTH 80
4
5  int main() {
6      FILE *sample_file;
7      int error, score, total;
8
9      sample_file = fopen("example_sources/sample.txt", "r");
10     if (sample_file == NULL) {
11         perror("Error opening file\n");
12         return 1;
13     }
14
15     while (fscanf(sample_file, "%d %d", &score, &total) == 2) { //
16         <- ==2 means each fscan must return 2 values, one for each col.
17         printf("Score: %d, Total: %d.\n", score, total);
18     }
19
20     error = fclose(sample_file);
21     if (error != 0) {
```

```
21         perror("fclose failed on input file\n");
22         return 1;
23     }
24
25     return 0;
26 }
27
```

Files in C 4 of 5

- Writing to Files

- **Syntax:** `output_file = fopen(const char *filename, "w")`

- * *w* overwrites existing file

- * *a* appends output to the end of file

```
1      #include <stdio.h>
2
3      int main() {
4          FILE *output_file;
5          int error;
6          int total = 50;
7          float small_number = 0.125;
8
9          output_file = fopen("example_sources/output.txt", "w")
10         ;
11         if (output_file == NULL) {
12             perror("Error opening file\n");
13             return 1;
14         }
15
16         fprintf(output_file, "The first line in the file\n");
17         fprintf(output_file, "The integer is %d\n", total);
18         fprintf(output_file, "The small float is %f\n",
19             small_number);
20
21         ...
22
23         return 0;
24     }
25
```

- NOTE: the output stream is first stored in memory controlled by OS before to disk



- * OS periodically writes content from memory to disk
- * Abnormal computer shutdown → some data may be lost

1

2