Assignment #2

Assigned: Nov. 19

Due: Tue., Nov. 27, 23:59

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Introduction

The purpose of this assignment is to get you familiar with `setjmp` and `longjmp`. You will have to **write a small program and a report**.

Logistics

This assignment should be done by yourself alone. Any plagiarism or use of another's idea or words without proper attribution or credit is strictly prohibited.

Reading Materials

You will first read a short introduction of `setjmp` and `longjmp` (`intro-setjmp-longjmp-ou.pdf`). It contains some code snippets on how to implement *cooperative multitasking* with `setjmp` and `longjmp`, which will be very helpful for the program you are about to write.

Coding

You should write a `c` program that can copy a file **in a cooperative-multitasking way using `setjmp` and `longjmp`**. In other words, your program should using `setjmp` and `longjmp` to implement two threads, one called `reader` and another `writer`. The reader reads data from the source file and put it in a buffer and the writer take the data out of the buffer and write it into the target file.

A sample program, `cpy.c`, which performs copy in a traditional way, is provided along with the assignment. You can refer to it if you don't know how to use `c` to copy a file. To run the program, first compile it using `gcc` :

```
$ gcc cpy.c -o cpy
```

Use it to copy `cpy.c` :

```
$ ./cpy cpy.c cpy-copy.c
```

Output

Your program should demonstrate how the cooperative-multitasking works. For example, you could print the log whenever `reader` reads or `writer` writes:

```
Start!
Reader thread reads 64 bytes.
Writer thread writes 64 bytes.
... ...
Writer thread writes 64 bytes.
Reader thread reads 64 bytes.
Writer thread writes 64 bytes.
Reader thread reads 59 bytes.
Writer thread writes 59 bytes.
Done!
```

To better show the process, set the size of the buffer smaller (e.g., 64 bytes) so that the reader and writer could actually cooperate.

Report

Write a short report on how your reader and writer cooperate. Enclose the output of your program when copying `cpy.c` in the report. Point out the pattern of the output and explain why.

Citation is NOT required.

Handin

You should pack your program and your report (as a PDF file) in a `zip` file and upload it to the `"WORK_UPLOAD/hw2"` folder on the FTP server.