

WASHINGTON STATE UNIVERSITY VANCOUVER

SYSTEMS PROGRAMMING - CS 360

Assignment 4

Instructor:
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Overall Assignment - 100 points

Write a program (in C) called `assignment4.c` targeted at the Linux platform that performs like a shell pipeline. **Example:**

```
# ./assignment4 ls : sort = # ls | sort
```

Where the colon breaks `argv` into a left (`ls`) and right (`sort`) portion. Implementation will fork/exec and setup a pipe such that:

- parent: left portion, runs with `stdout = pipe write end`
- child: right portion, runs with `stdin = pipe read end`
- Consider swapping parent and child functions, why?

Program Interface (Required)

```
./assignment4 <arg1> : <arg2>
```

Where: `<arg1>` and `<arg2>` are optional parameters that specify the programs to be run. If `<arg1>` is specified but `<arg2>` is not, then `<arg1>` should be run as though there was not a colon. Same for if `<arg2>` is specified but `<arg1>` is not.

Specifications and Restrictions

- (60 points - Autolab) Must pass tests on various inputs.
- (20 points - Autolab/TA) Must be robust, including error catching. You must catch errors and print out (to `stdout`) only message produced by that error using `strerr()`. This means you will need to `errno.h` and `string.h`, libraries at least.
- (Required) Design one source file `assignment4.c`
- Helpful functions: `fork`, `exec`, `dup` (or `dup2`), `open`/ `close`, `exit`, `wait`, etc. (consult man pages as needed)
- Do not use `popen` or `system`.
- **Note:** The specification for this program is intentionally incomplete. Consider various situations and exception conditions that may occur. Determine a reasonable interpretation of the arguments, then design and implement a robust program.
- **Note:** You may not include any additional header files.
- You will need a `main`. Unlike previous assignments, you are writing an independent program that I will be executing and comparing output. As such, you should remove all debug print statements before submitting to autolab, otherwise the tests may fail.

What to turn in (to Autolab):

- `assignment4.c` (no header files)