UNX511 Lab 7: Pipes Between Processes

Due: Sunday, July 20, 2025 (11:59pm)

In this lab you will create a program that will take two arguments, with the intention that the output of the first argument will be piped to the second argument. This is done to simulate shell behaviour. Your program will be invoked as follows:
$ **./Lab7 <argument1> <argument2>**

<argument1> and **<argument2>** could be one, two or three strings in length.
If an argument is more than one string in length, it has to be put in quotes.

For instance, say you want to see if any syslog processes are running on your machine, you would type the following from the command line:
$ **ps -aux | grep -i syslog**

Your program should do the exact same thing if invoked as follows:
$ **./Lab7 "ps -aux" "grep -i syslog"**

where **<argument1>="ps -aux"** and **<argument2>="grep -i syslog"**.

The idea basically is to use **pipe()** in your code to pipe the output of one process (**<argument1>**) into the input of the second process (**<argument2>**) and display the results on the screen.

You may have problems breaking up argument1 and/or argument2 into separate strings. Here is one way to do so:

```
const int LEN=32;

char argument1[LEN];
char argument2[LEN];
strcpy(argument1, argv[1]);
strcpy(argument2, argv[2]);
char arg1[3][LEN];//max 3 strings
char arg2[3][LEN];//max 3 strings
int len1=0, len2=0;

char *token=strtok(argument1, " ");
while(token!=NULL) {
   strcpy(arg1[len1], token);
   token=strtok(NULL, " ");
   ++len1;
}
token=strtok(argument2, " ");
while(token!=NULL) {
   strcpy(arg2[len2], token);
   token=strtok(NULL, " ");
   ++len2;
}
```

For assistance on this, please see the video:
Pipe, fork, dup exec explained

In your submission of Lab7.cpp, please answer the following questions in your own words:

1. How does dup() work?
2. How does dup2() work?
3. How does execlp() work?

Assignment Submission:

- Complete all steps, Add all output-screenshot and explanations (if required) to a MS-Word file.
- Add the following declaration at the top of MSWORD file and source code

```
/*************************************************************************
* UNX511-Lab7
* I declare that this lab is my own work in accordance with Seneca Academic Policy.
* No part of this assignment has been copied manually or electronically from any other source
* (including web sites) or distributed to other students.
*
* Name: _____ Student ID: _____ Date: _____
*
*
*************************************************************************/
```

- Please answer the following two declarations:
    - D1) On a scale from 1 to 5, **How much did you use generative AI to complete this assignment?**
        - where:
        - **1** means you did not use generative AI at all
        - **2** means you used it very minimally
        - **3** means you used it moderately
        - **4** means you used it significantly
        - **5** means you relied on it almost entirely
        - **Your answer :**
    - D2) On a scale from 1 to 5, **How confident are you in your understanding of the generative AI support you utilized in this assignment, and in your ability to explain it if questioned?**
        - where:
        - **1** means "Not confident at all – I do not understand the generative AI support I used and cannot explain it."
        - **2** means "Slightly confident – I understand a little, but I have many uncertainties."

- **3** means "Moderately confident – I understand the majority of the support, though some parts are unclear."
- **4** means "Very confident – I understand most of the AI support well and can explain it with minor gaps."
- **5** means "Extremely confident – I fully understand the generative AI support I used and can clearly explain or justify it if asked."
- **Your answer :**

- Please submit the Source code (zip all .c, .h, and makeFiles)

Important Note:

- **LATE SUBMISSIONS for labs**. There is a deduction of 10% for Late assignment submissions, and after three days it will grade of zero (0).
- This labs should be submitted along with a video-recording which contains a detailed walkthrough of solution. Without recording, the assignment can get a maximum of 1/3 of the total.
    - Note: In case you are running out of time to record the video, you can submit the assignment (source code + screenshots) by the deadline and submit the video within 24 hours after the deadline.