

CSC 256/456: Operating Systems

Debugging Tips

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Debuggers

- ❖ **GNU Debugger (gdb)**
 - ❖ **Will be used for debugging kernel code**
- ❖ LLVM Project Debugger (lldb)
- ❖ Xcode (Mac OS X Integrated Development Environment)

Tools for Tracing System Calls

- ❖ `strace` (Linux)
- ❖ `truss` (Solaris)
- ❖ `dtrace` (Solaris, Mac OS X, maybe BSD)

Time Honored Tradition

- ❖ Debugging `printf()` calls
- ❖ `script` command
 - ❖ Starts a new shell
 - ❖ Records all input/output in a file called `typescript`
 - ❖ Stops recording when new shell exits

Commands to Test Pipes

- ❖ `ls`: Lists files in the specified directory
- ❖ `ps`: List processes
- ❖ `grep x`: Searches for the word x in its input
- ❖ `wc`: Prints the number of words in its input
- ❖ `cat`: Prints the contents of a file to standard output
- ❖ `sort`: Sorts standard input and prints to standard output

What is Wrong with This Code?

```
if (fork == 0) {  
    if (execvp (...) == -1) {  
        printf ("Error\n");  
    }  
}  
  
/* Parent Code */  
wait (&status);
```

Problem # 1

- ❖ Forgetting that child can execute same code as parent

```
if (fork() == 0) {  
    if (execvp (...) == -1) {  
        printf ("Error\n");  
    }  
}  
  
/* Parent Code */  
wait (&status);
```

Problem #2

- ❖ Forgetting to check error codes

```
if (fork() == 0) {  
    if (execvp (...) == -1) {  
        printf ("Error\n");  
    }  
}  
  
/* Parent Code */  
wait (&status);
```