

CS 544 (Spring 2026): Hand-In Worksheet 1 (Shell)

Full Name: _____

Student ID Number: _____

Consider the following shell commands, typed into a terminal in order:

```
A &> B
cat B | C | D &
cat B | E > F
```

Draw arrows and boxes to illustrate below how data will flow between processes and files. For simplicity, we will ignore stderr here.

First, infer which of B through F are processes, and draw boxes for them, like A. Also identify which correspond to data files, and write those in the "files" area.

Next, draw arrows showing how data flows between stdins, stdouts, files, and the terminal output. For simplicity, do NOT draw boxes for the "cat" processes used to connect endpoints. Rather, label arrows that make use of cat with "cat".

Finally, draw an asterisk/star (*) inside any process that runs asynchronously (if any). Assume all the processes run without error and exit normally.

