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## **Project 1 Report**

**(15 pts) A cohesive summary of what you learned in the project. This should be no more than two paragraphs.**

During this project, I developed a dynamic array within a struct to manage commands and background tasks for a UNIX shell simulation. This array was crucial in storing commands for execution via `execvp` and for managing a changing list of background processes. I enhanced my skills in parsing input lines, segregating command arguments, and dynamically managing the memory associated with these commands. Furthermore, I learned to differentiate between built-in and external commands using `strcmp`, handling the former with standard UNIX functions like `getpid`, `getppid`, `chdir`, and `getcwd`.

In executing processes, I adopted an alternative to the double `fork` approach discussed in lab, managing processes through my array and determining their foreground or background execution accordingly. This involved adding background tasks to a jobs list and waiting for foreground tasks to complete. The program also checks for the completion of background processes with each new command input. As a side experiment, I utilized `goto` statements to navigate program flow, ensuring proper memory management by freeing objects at appropriate times. This project not only bolstered my understanding of process management in UNIX systems but also allowed me to explore unconventional programming practices for efficient resource management.

**(85 pts) A .zip or .tar file containing all source code files and a Makefile for your program.**

Provided a file called "project1\_msudipto.zip" which contains all source code files and a Makefile for your program.