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Program 2: ThreadOS Shell

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Project 2 Report

The Shell.java file implements a basic shell in Java. The Shell class extends the Thread class, allowing it to be executed as a separate thread. When the Shell is run, it enters an infinite loop and waits for user input. Once the user enters input, it is parsed and executed using the SysLib.exec() method, which runs the specified command in a separate thread. The Shell then waits for each thread to complete using the SysLib.join() method before continuing. Shell uses the SysLib.stringToArgs() method to parse the input and convert it into an array of arguments that are passed to the SysLib.exec() method, which creates a new thread and runs the specified command with the given arguments. If the command or program takes a long time to complete, the Shell will wait for it to finish before moving on to the next command.

The algorithm of Shell.java initiates with the shell going into an infinite loop, displaying a prompt and awaiting user commands. Commands entered by the user are parsed into individual or concurrent executions based on the ';' and '&' delimiters, respectively. For each parsed command, SysLib.exec() is invoked to execute the command in a new thread, thereby allowing for concurrent and sequential command processing. The shell utilizes SysLib.join() to synchronize command executions, ensuring sequential commands wait for their predecessors to complete before proceeding, while also managing concurrent commands to run simultaneously yet track their completion accurately. The process iterates, incrementing the command count after each user input and finally, the program terminates by calling SysLib.exit().

The output when testing

[illegible]