

# Simple Shell Documentation

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## 1. Overview

Simple Shell is a simple command-line interface that accepts several commands from the user and launch jobs in the operating system accordingly.

## 2. Functionalities

### (1) Supported Commands and Command Formats

- **cd** *<pathname>*: allows users to change the working directory. If the provided pathname is not valid for any reason (no such directory, not a directory etc.), an error will be reported.
- **ls** *<pathname(optional)> <options>*: lists directory contents, if the pathname provided is invalid, an error will be reported. (no such directory/not a directory/etc.) If a wrong number of argument is passed in, an error will be reported.
  - *<option>*: supports any options that bash supports for ls (-l, -a, etc.)
- **query** *<pid>*: allows querying of the status of any process that has been run in the Simple Shell, specified by its *pid*. The returned status will include
  - (i) the *pid* of the process
  - (ii) whether the process (a child) has been reaped or not
  - (iii) the state of the process (active/sleeping/terminated normally/terminated by a signal of a certain number etc.)If the specified *pid* is not a process run in the Simple Shell, an error will be reported.
- **show**: lists all the *pids* of processes that have been launched in the Simple Shell in this working session, together with whether the process (child) and the current status of the process, in a simpler fashion than the query command.
- **clear**: clears the screen

- **exit**: exits the Simple Shell

## **(2) Useful Side Features**

### **• Job Running Mode**

Simple Shell supports two modes in which a process can be launched: *foreground* and *background*. Running the process in the *foreground* will block the shell until the process terminates. Running the process in the *background* will immediately give control back to the shell, allowing other commands to be invoked.

Users can specify the running mode of a command by prepending the command with “*fg*” or “*bg*”: “*fg*” indicates *foreground* mode and “*bg*” indicates *background* mode. If no prefixes are added, the command will automatically be launched in *foreground* mode.

### **• Auto-recovery of Background Processes**

Processes that are launched in background mode and terminated by any signal other than SIGKILL or SIGSEGV will be automatically re-launched in the foreground mode.

### **• Redirection Operator “>”**

The outputs of commands that are usually displayed to the screen can be redirected to a file. Users can specify the file by appending “> <filename>” to the command. If the file does not exist, a file of the specified name will be created. If the file exists, the output will be appended to the end of the specified file.

(Note that the output of the *show* command cannot be redirected, while those of *ls* and *query* can be.)

## **3. Running Simple Shell**

- Use the provided Makefile and the *make* command to compile the code.
- Start the executable obtained after successful compilation and enter simple shell
- Enter commands with the format described above and launch jobs in Simple Shell.
- Type the *exit* command to leave Simple Shell.