

CUSTOM SHELL EMULATOR

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MY SHELL

This custom shell project is designed to demonstrate core operating system concepts like process management, file handling, job control, and user interaction in a Linux-based shell environment(BASH). The shell, named '**myshell**', supports various user-friendly and OS-level features, allowing for efficient command execution and OS interaction.

PROBLEM STATEMENT

The “Custom Shell Emulator” project is designed to simulate a Unix-like command-line interface, enabling users to perform essential shell operations within a user-friendly, extensible shell script. Developed in Bash, the project includes support for various core shell features, such as directory navigation, command history, command chaining, background process handling, input/output redirection, and environment variable management. The project utilizes associative arrays and arrays to manage aliases and command history efficiently.

FEATURES

CHANGING DIRECTORY

```
mishand@DESKTOP-4LNQ85G:~$ ./myshell.sh
myshell> cd test
myshell> pwd
/home/mishand/test
myshell> |
```

CREATING DIRECTORY

```
mishand@DESKTOP-4LNQ85G:~$ ./myshell.sh
myshell> sleep 10 &
myshell> pwd
/home/mishand
myshell> cd test
myshell> mkdir text
myshell> cd text
myshell> pwd
/home/mishand/test/text
myshell>
```

CHAINING

```
mishand@DESKTOP-4LNQ85G:~$ ./myshell.sh
myshell> echo "1" && echo "2" && echo "3" && echo "4"
1
2
3
4
myshell> |
```

PIPING

```
myshell> cat testfile.txt | grep "HELLO"
HELLO WORLD
myshell> vim testfile.txt
myshell> cat testfile.txt | grep "HELLO"
HELLO WORLD
HELLO SHREYA
HELLO MISHA
myshell> cat testfile.txt
HELLO WORLD
hiiii
HELLO SHREYA
okieee
HELLO MISHA
myshell> |
```

ERROR HANDLING

```
mishand@DESKTOP-4LNQ85G:~$ ./myshell.sh
myshell> open www.youtube.com
Error opening URL
```

```
mishand@DESKTOP-4LNQ85G:~$ ./myshell.sh
myshell> cd test.dir
Directory not found: test.dir
myshell> |
```

HELP

```
myshell> help
Available Commands:
    history
    env
    set VAR VALUE
    alias name command
    alias -l
    unalias name
    cd <directory>
    open <URL>
    help
    exit
```

- Show command history
- Show environment variables
- Set environment variable
- Set command alias
- List all aliases
- Remove an alias
- Change directory
- Open a website
- Show this help message
- Exit the shell

HISTORY

```
myshell> history
Command History:
1: open www.youtube.com
2: set MY_VAR "Hello, World!"
3: set VAR "hello world"
4: set VAR VALUE
5: alias ll "ls -la"
6: alias home "~"
7: alias -l
8: help
9: history
```

LISTS ELEMENTS OF DIRECTORY

```
myshell> ls  
myshell.sh  sample.txt  test  test.txt  testdir
```

ALIAS AND ENV CREATION

```
Environment variable set  
myshell> alias ll "ls -la"  
Alias set: ll = "ls -la"  
myshell> alias home "~"  
Alias set: home = "~"  
myshell> alias -l  
Aliases:  
ll = "ls -la"  
home = "~"
```

```
mishand@DESKTOP-4LNQ85G:~$ ./myshell.sh  
myshell> set MYVAR 45  
Environment variable MYVAR set to 45  
myshell> printenv MYVAR  
45  
myshell> |
```

VIEW ENVIRONMENTAL VARIABLES

```
myshell> env
Environment Variables:
SHELL=/bin/bash
WSL2_GUI_APPS_ENABLED=1
WSL_DISTRO_NAME=Ubuntu
NAME=DESKTOP-4LNQ85G
PWD=/home/mishand
LOGNAME=mishand
HOME=/home/mishand
LANG=C.UTF-8
WSL_INTEROP=/run/wsl/361_interop
LS_COLORS=rs=0:di=01;34:ln=01;36:nh=00:pi=40;33:so=01;35:do=01;35:bd=40;33:01:cd=40;33:01:or=40;31:01:mi=00:su=37;41:sg=30;43:ca=30;41:tw=30;42:ow=34;42:st=37;44:ex=01;32:*.tar=01;31:*.tgz=01;31:*.arc=01;31:*.arj=01;31:*.taz=01;31:*.lha=01;31:*.lz4=01;31:*.lzh=01;31:*.lzma=01;31:*.tlz=01;31:*.txz=01;31:*.tzo=01;31:*.tz=01;31:*.zip=01;31:*.gz=01;31:*.lrz=01;31:*.lzo=01;31:*.xz=01;31:*.zst=01;31:*.bz=01;31:*.tbz=01;31:*.deb=01;31:*.rpm=01;31:*.jar=01;31:*.war=01;31:*.ear=01;31:*.sar=01;31:*.rar=01;31:*.alz=01;31:*.ace=01;31:*.zoo=01;31:*.cpio=01;31:*.7z=01;31:*.rz=01;31:*.cab=01;31:*.wim=01;31:*.swm=01;31:*.dwm=01;31:*.esd=01;31:*.jpeg=01;35:*.jpg=01;35:*.mpeg=01;35:*.gif=01;35:*.bmp=01;35:*.pbm=01;35:*.pgm=01;35:*.ppm=01;35:*.tga=01;35:*.xbm=01;35:*.xpm=01;35:*.tif=01;35:*.tiff=01;35:*.png=01;35:*.svg=01;35:*.svgz=01;35:*.mng=01;35:*.pcx=01;35:*.mov=01;35:*.mpg=01;35:*.mpeg=01;35:*.m2v=01;35:*.mkv=01;35:*.webm=01;35:*.webp=01;35:*.ogm=01;35:*.mp4=01;35:*.m4v=01;35:*.mp4v=01;35:*.vob=01;35:*.qt=01;35:*.nuv=01;35:*.wmv=01;35:*.ASF=01;35:*.rm=01;35:*.rmvb=01;35:*.flc=01;35:*.avi=01;35:*.fli=01;35:*.flv=01;35:*.gl=01;35:*.dl=01;35:*.xcf=01;35:*.xwd=01;35:*.yuv=01;35:*.cgm=01;35:*.emf=01;35:*.ogv=01;35:*.ogg=01;35:*.aac=00;36:*.au=00;36:*.flac=00;36:*.m4a=00;36:*.mid=00;36:*.mp3=00;36:*.mpc=00;36:*.ogg=00;36:*.ra=00;36:*.wav=00;36:*.oga=00;36:*.opus=00;36:*.spx=00;36:*.xspf=00;36:*
WAYLAND_DISPLAY=wayland-0
LESSCLOSE=/usr/bin/lesspipe %s %
TERM=xterm-256color
LESSOPEN=| /usr/bin/lesspipe %
USER=mishand
DISPLAY=:0
SHLVL=2
VAR=VALUE
XDG_RUNTIME_DIR=/run/user/1000/
WSLENV=
XDG_DATA_DIRS=/usr/local/share:/usr/share:/var/lib/snapd/desktop
PATH=/usr/local/sbin:/usr/local/bin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/usr/lib/wsl/lib:/mnt/c/Program Files/Common Files/Oracle/Java/javapath:/mnt/c/Program Files (x86)/Common Files/Oracle/Java/java8path:/mnt/c/Program Files (x86)/Common Files/Oracle/Java/javapath:/mnt/c/Windows/system32:/mnt/c/Windows/System32/Wbem:/mnt/c/Windows/System32/WindowsPowerShell/v1.0:/mnt/c/Windows/System32/OpenSSH:/mnt/c/sqlite:/mnt/c/Program Files/Git/cmd:/mnt/c/Users/Lenovo/AppData/Local/Programs/Python/Python313/Scripts:/mnt/c/Users/Lenovo/AppData/Local/Programs/Python/Python313:/mnt/c/Users/Lenovo/AppData/Local/Programs/Python/Launcher:/mnt/c/Users/Lenovo/AppData/Local/Microsoft/WindowsApps:/mnt/c/Users/Lenovo/AppData/Local/Programs/Microsoft VS Code/bin:/mnt/c/MinGW/bin:/mnt/c/Program Files/JetBrains/IntelliJ IDEA Community Edition 2024.1.5/bin:/snap/bin
DBUS_SESSION_BUS_ADDRESS=unix:path=/run/user/1000/bus
HOSTTYPE=x86_64
PULSE_SERVER=unix:/mnt/wslg/PulseServer
_=~/usr/bin/printenv
myshell>
```

SCHEDULING

```
mishand@DESKTOP-4LNQ85G:~$ ./myshell.sh
myshell> ps
  PID TTY          TIME CMD
 614 pts/0        00:00:00 bash
 669 pts/0        00:00:00 myshell.sh
 674 pts/0        00:00:00 ps
myshell> sleep 10 &
myshell> ps
  PID TTY          TIME CMD
 614 pts/0        00:00:00 bash
 669 pts/0        00:00:00 myshell.sh
 712 pts/0        00:00:00 myshell.sh
 713 pts/0        00:00:00 sleep
 718 pts/0        00:00:00 ps
myshell> |
```

THANK YOU