

Assignment - 1

Aim : Create a shell for ubuntu operating system which will mimic the behavior of bash shell.

Theory :

Shell in ubuntu :

In Linux, the shell is the user interface used to command the system. It accepts human-readable commands from the user and converts them into something the operating system can understand. A shell script is a series of commands written in plain text file. It is just like batch file in MS-DOS but it has more features compared to the batch file. Shell scripting is a powerful programming method allowing for an efficient way of executing a sequence of commands.

Some basic shell commands :

pwd: Print Working Directory - shows the current directory you are in.

ls: List Directory Contents - displays the files and directories in the current directory.

cd: Change Directory - used to change the current working directory.

mkdir: Make Directory - creates a new directory.

rmdir: Remove Directory - removes an empty directory.

rm: Remove - deletes files or directories.

touch: Create Empty File - creates an empty file.

cat: Concatenate and display file contents - displays the contents of a file.

sudo: Superuser Do - executes a command with superuser (administrative) privileges.

Program & Output

```
import os
from tkinter import *
import getpass
import socket

def execute_command():

    input = command.get()

    output_text.insert(END, f' {input}\n')

    if input.lower() == "exit":
        root.destroy()
        return

    try:
        if(input == "history"):
            output = os.popen("cat /home/vedant/.bash_history").read()
        elif(input == "top"):
            output = os.popen("ps aux").read()
        else:
            output = os.popen(input).read()
        output_text.insert(END, output)
    except Exception as e:
        output_text.insert(END, f"Error executing command: {e}\n")

    command.delete(0,END)
    output_text.insert(END, f"{username}@{hostname} ~ ")

if __name__ == "__main__":

    root = Tk()
    root.title("Terminal")
    root.configure(bg="#000")
    root.resizable(False,False)

    username = getpass.getuser()
    hostname = socket.gethostname()
```

```
    output_text = Text(root, wrap=WORD, width=80, height=30, bg="#000",
fg="#fff")
    output_text.grid(row=0, column=0, padx=10, pady=10)

    scrollbar = Scrollbar(root, command=output_text.yview)
    scrollbar.grid(row=0, column=1, sticky='nsew')
    output_text.config(yscrollcommand=scrollbar.set)

    output_text.insert(END, f"{username}@{hostname} ~")

    command = Entry(root, width=80 , bg="#000", fg="#fff",
insertbackground="#fff")
    command.grid(row=1, column=0, padx=10, pady=10, ipady=5)

    # Create a button to execute the command
    execute_button = Button(root, text="Execute",
command=execute_command,bg="#000", fg="#fff")
    execute_button.grid(row=2, column=0, pady=10, padx=10, sticky=W)

    root.mainloop()
```

Terminal

```
vedant@lenovo-ideapad-gaming3-15arh05d ~ ls  
scheduling_algorithm.py  
shell.py  
vedant@lenovo-ideapad-gaming3-15arh05d ~
```

Execute

Terminal

```
vedant@lenovo-ideapad-gaming3-15arh05d ~ ls  
scheduling_algorithm.py  
shell.py  
vedant@lenovo-ideapad-gaming3-15arh05d ~ echo vedant kale  
vedant kale  
vedant@lenovo-ideapad-gaming3-15arh05d ~
```

Execute

Terminal

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```

```
vedant@lenovo-ideapad-gaming3-15arh05d ~ history
df
sudo apt update
sudo apt upgrade
ls
cd Downloads/
./configure
tar -zxvf postman-linux-x64.tar.gz
postman
nano /home
sudo apt-get install git
sudo apt install nodejs
node -v
sudo apt install npm
git -v
git --version
git clone git@github.com:COD-23/StudyNex---Frontend.git
cd ..
cd ~/ ssh
```

Execute

```
Terminal
wget https://releases.hyper.is/download/deb -O hyper.deb
sudo dpkg -i hyper.deb
ls
vedant@lenovo-ideapad-gaming3-15arh05d ~ top
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1  0.0  0.1 166732  9252 ?        Ss   09:01   0:02 /sbin/init
splash
root         2  0.0  0.0      0     0 ?        S    09:01   0:00 [kthreadd]
root         3  0.0  0.0      0     0 ?        I<   09:01   0:00 [rcu_gp]
root         4  0.0  0.0      0     0 ?        I<   09:01   0:00 [rcu_par_gp]
root         5  0.0  0.0      0     0 ?        I<   09:01   0:00
[slub_flushwq]
root         6  0.0  0.0      0     0 ?        I<   09:01   0:00 [netns]
root        11  0.0  0.0      0     0 ?        I<   09:01   0:00
[mm_percpu_wq]
root        12  0.0  0.0      0     0 ?        I    09:01   0:00
[rcu_tasks_kthread]
root        13  0.0  0.0      0     0 ?        I    09:01   0:00
[rcu_tasks_rude_kthread]
root        14  0.0  0.0      0     0 ?        I    09:01   0:00
[rcu_tasks_trace_kthread]
root        15  0.0  0.0      0     0 ?        S    09:01   0:00 [ksoftirqd/0]
root        16  0.0  0.0      0     0 ?        I    09:01   0:20 [rcu_preempt]
root        17  0.0  0.0      0     0 ?        S    09:01   0:00 [migration/0]
root        18  0.0  0.0      0     0 ?        S    09:01   0:00
[idle_inject/0]
root        19  0.0  0.0      0     0 ?        S    09:01   0:00 [cpuhp/0]
root        20  0.0  0.0      0     0 ?        S    09:01   0:00 [cpuhp/2]
root        21  0.0  0.0      0     0 ?        S    09:01   0:00
[idle_inject/2]
root        22  0.0  0.0      0     0 ?        S    09:01   0:00 [migration/2]

Execute
```

Conclusion :

Hence, here we learnt about shell and shell commands and constructed a python terminal app using tkinter.