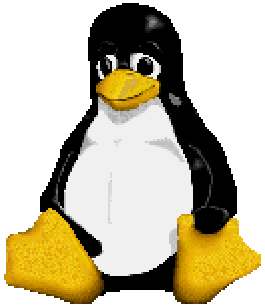

More Raspian

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Nano, a simple editor

- Nano does not require the mouse. You must use your keyboard to move around the file and make changes.
  - Can be used in a ssh connection.
- nano uses control-key commands. For example, to exit nano, press and hold ***`ctrl-x`*** (depress the ***`control key`*** and ***`x`*** at the same time)
- When running, nano shows a list of important control keys at the bottom of the screen. To view a complete list, press ***`ctrl-G`***, or press the ***`F1`*** key.
- To start nano, type: nano at the terminal prompt
- To save the changes to a file press ***`ctrl-o`*** to save the file and ***`ctrl-x`*** to quit.
- You can also edit files using vi or Leafpad (on the Desktop) or install a new editor using ***apt-get install***
  - I recommend emacs---very powerful, but a big learning curve.

Configuatin Files

- Remember the command, ***sudo raspi-config***
  - raspi-config is actually a user-friendly front end to the config.txt configuration file located in the /etc directory
- Linux applications use configuration files to manage settings.
- For system applications they are typically located in /etc. Try listing (ls) that directory
  - Some are in directories, and often have a .conf extension
- Always invoke sudo to edit a configuration file located in the /etc directory
  - Try ***sudo su*** to switch to being the adminstrator

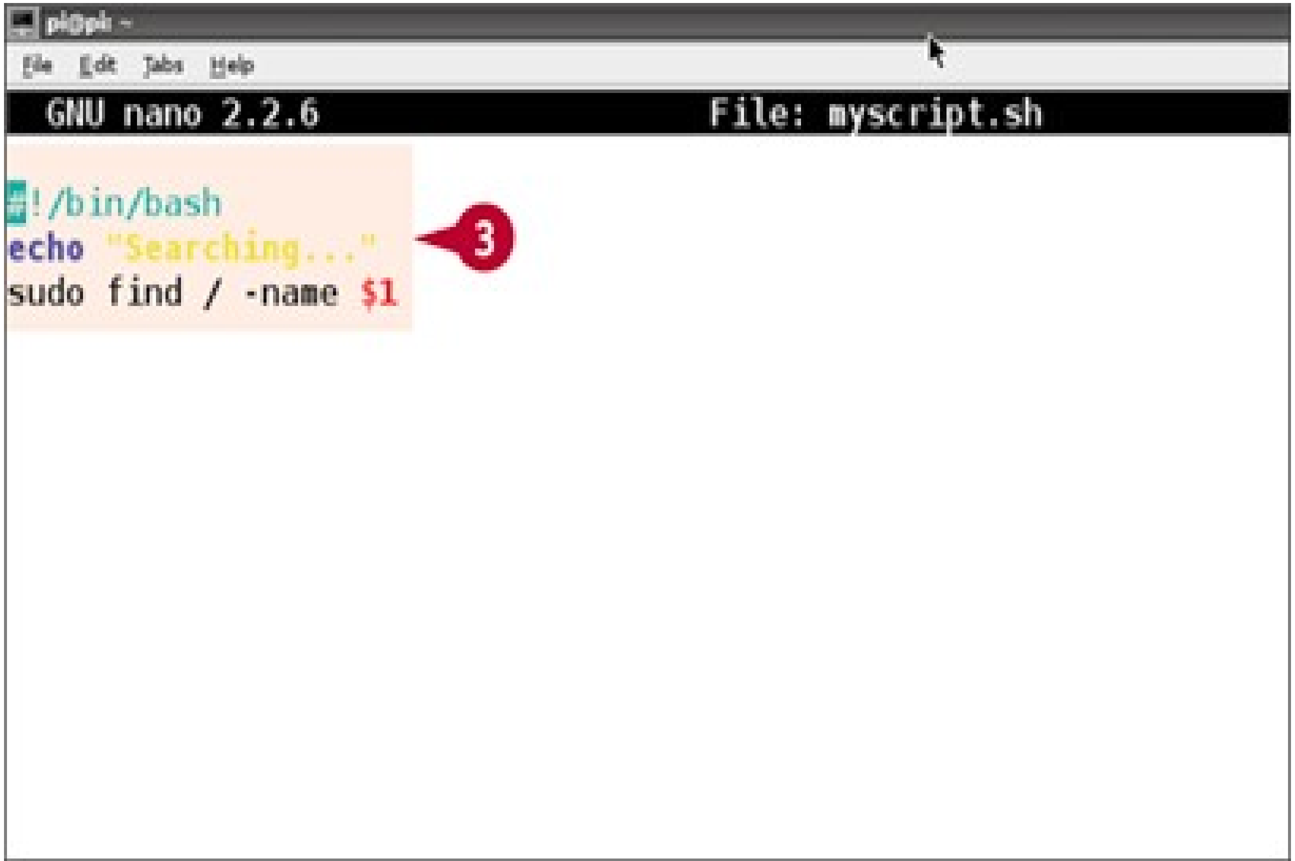
Customize your shell

- A login shell is a bash shell that is started with - or --login. The following are examples that will invoke a login shell.
  - sudo su -
  - bash --login
  - ssh user@host
- When BASH is invoked as a login shell, the following files are executed in the order listed
  - /etc/profile
  - ~/.profile
- Although ~/.bashrc is not listed here, most default ~/.profile scripts run ~/.bashrc
- Edit .bashrc to define a new prompt and introduce a few aliases
  - PS1=”hello class: “
  - Remove the # (comment marker) on the following lines:
    - alias ll='ls -l'
    - alias la='ls -a'
    - alias l='ls -CF'

Shell scripts

- raspi-config is actually a Bash shell script (Linux script files typically have the file extension .sh)
  - The raspi-config script is located in /usr/bin
- Create a simple script named myscript.sh in your home directory

From *Teach Yourself VISUALLY Raspberry Pi*



```
  GNU nano 2.2.6                    File: myscript.sh

#!/bin/bash
echo "Searching..."
sudo find / -name $1
```

Type ***chmod 755 myscript.sh*** to change the permissions on the script so it can run

Changing your PATH

- Try running the script, type ***myscript.sh*** at the prompt
- It doesn't run; now try: ./***myscript.sh***
  - The current directory is not in your PATH
- Type ***nano .bashrc***
  - .bashrc is a configuration file for the Bash shell
- Add the following line to the end of the file & save:

  ```
  PATH=$PATH:$PWD
  ```

  - This line tells the Bash shell to look for scripts in your current directory.
- Type ***source .bashrc*** to apply your new PATH variable to the current environment
- Try running the script
  - The script finds the filename you specify when you run it, and then stops

Shell Variables and more Shell Programming

- Enter the cammand: ***env*** to see the active environment variables
- Type: ***export VARIABLE="SOMETHING"*** and run env again
- Shell script command-line arguments are reffered to using positional parameters $1, $2, $3, ... up to $9.
- Shell programs are made of commands, variables, and *control structures*
  - Conditional
  - Looping

Conditional (for the bash shell)

Form:

-
  ```
  if [ <TEST> ]; then
  DO SOMETHING
  fi
  ```

Example:

-
  ```
  if [ $number % 3 -eq 0 ]; then
  echo "Fizz"
  fi
  ```

Loops

- Form:

  -
    ```
    while [ TEST ]; do
    DO SOMETHING
    done
    ```

- Example:

```
#!/bin/bash
c=1
while [ $c -le 5 ]
    do
    echo "Welcone $c times"
    (( c++ ))
done
```

An Example

```
#!/bin/bash
trap 'echo Thank you for playing' EXIT

magicnum=$(($RANDOM%10+1))
echo 'Guess a number between 1 and 10:'
while echo -n 'Guess: ' >&2 ; read guess; do
    sleep 1
    if [ "$guess" = $magicnum ]; then
        echo 'Right!'
        exit
    fi
    echo 'Wrong!'
done
```

System Admin

- The sudo command makes you (for that command only) the system administrator
  - sudo su (switch users to be the administrator or root user)
- Add a new user account, type (all one command):
  - ***sudo useradd -m -G adm,dialout,cdrom,audio,plugdev,users, lpadmin,sambashare,vchiq,powerdev <username>***
  - set a password on the new account, ***type sudo passwd <username>***
- Updating, install & removing software
  - sudo apt-get update
  - sudo apt-get install <*name*>
  - sudo apt-cache search <*name*>   or

    sudo dpkg -get-selections > ~/Desktop/packages
  - sudo apt-get remove <*name*>

More Sys Admin Tools

- Resource management:
  - top
  - free -m
  - sudo df -h
  - ps
  - kill − 9 <PID>
  - Reading Information in /proc
    - Everything you ever needed to know about the system state or running processes can be found in /proc
    - CPU configuration, stored in /proc/cpuinfo
    - memory usage, stored in /proc/meminfo
- File commands:
  - find /mnt/Volume1 –empty –name fooBar –exec rm
  - grep, sed, awk....