More bash & SLURM

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Overview

Today's Goals

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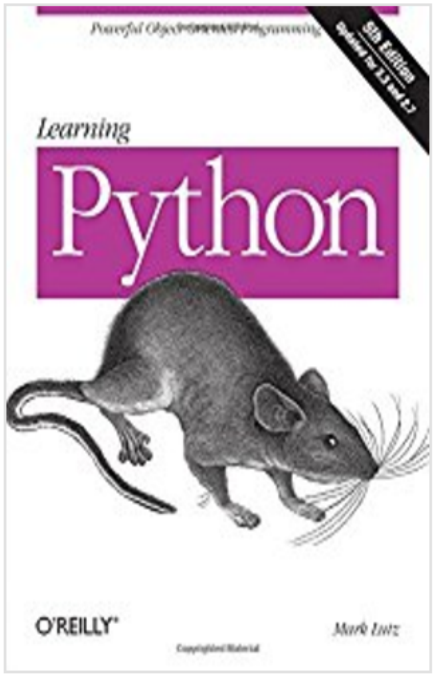
  - sort, uniq, cut, nano
- Learn some advanced commands
  - grep, sed, awk
- Answer some Emmy trivia questions

More Twitter



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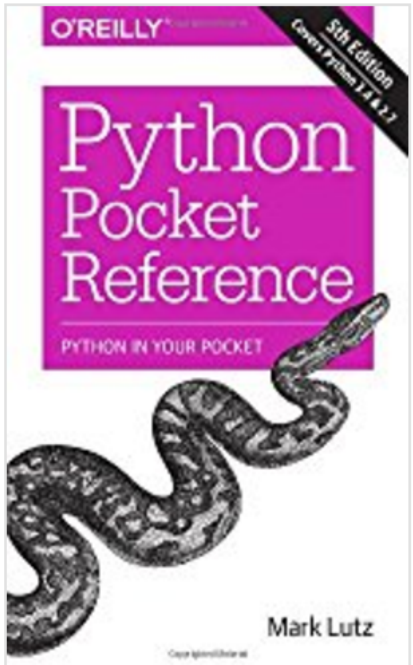
Paperback



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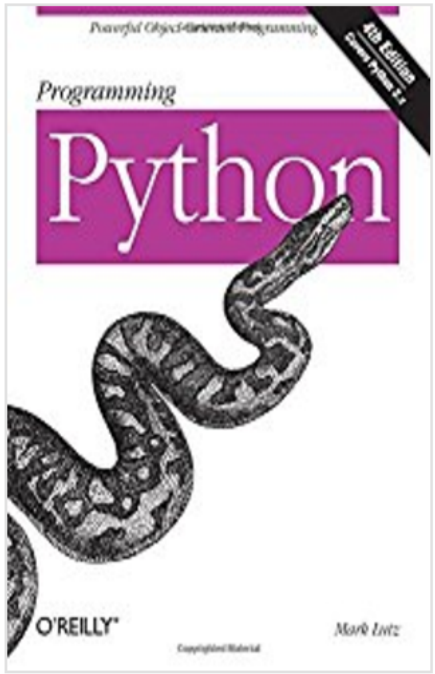

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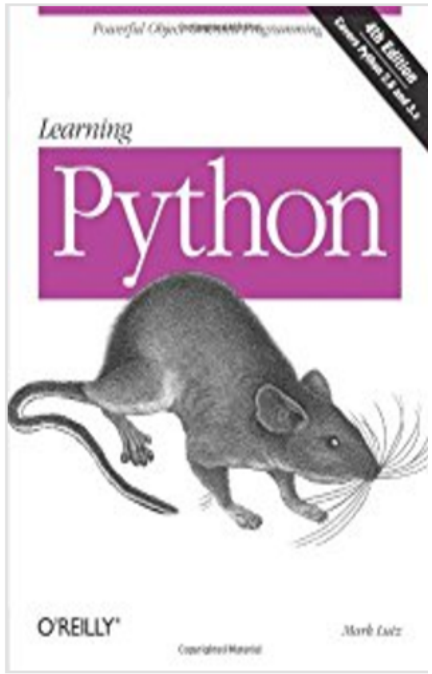

$6.74
Paperback

by Mark Lutz

More Twitter

Logging On

- Use command “ssh”
- Logs on to one of two compute nodes:

```
ssh <netid>@dscr-slogin-01.oit.duke.edu
```

- Your terminal window is now on the computer “dscr-slogin-01.oit.duke.edu”
- You may have set up an alias:

```
alias DSCR="ssh <your netid>@dscr-slogin-01.oit.duke.edu"
```

File Generation

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- Adding a filename "`nano <file>`" opens that file

- And use `scp` to move it up to the cluster

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- Or make a file on your local computer
- And use `scp` to move it up to the cluster

Tips and Help

- Spaces and order matter
- General grammar rules:

  `<command> <flags> <input>`
- If you're unsure what the flags are "-h" or "–help" often works
- Using "tab" auto-completes filenames and commands
- Prevents typos

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- Let's delve into some of those!

Datafile

- Emmy Winners 1949 to Present

  `/work/cc216/490S/cc216/emmy-awards-1949-2017.csv`
- Copy to your own folder, then pull out the nominees

```
grep ^20.., emmy-awards-1949-2017.csv | sed 's/, Nonfiction,//g' | cut -d, -f4 > nominees.list
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Tools

- Input and output from commandline
  - Using > and |
- `cat, less, head, tail` - inspecting files and output
- `sort` - sorting
- `uniq` - sort and eliminate duplicates
- `cut` - split a file into columns

Input and Output

- Unless otherwise noted:
  - Input comes after the command
  - Output “prints to screen”
- Using > and | changes that
- > takes output and (over)writes to a file

```
ls > list.txt
```

- If you use double >> it appends to a file

```
ls -lt >> list.txt
```

Input and Output

- Using | changes input
- | takes output and passes it to the next command

```
ls | head -n1
```

- You can string together many |'s to perform complicated actions

Inspecting Files and Output

- `cat, less, head, tail`
- `cat` - prints the whole file to screen

```
cat <name of file>
```

- `less - opens the file so you can scroll through it (q to quit)`
- `head, tail` - return the first or last 10 lines of a file

```
head <name of file>; tail <name of file>
```

- Common flags:
  - -n number of lines (overrides 10)

sort

- `sort` takes input and sorts it! (simple, right?)

```
sort <name of file>
cat <name of file> | sort
```

- Common flags:
  - -n sorts numerically
  - -u sorts and only presents unique hits
  - -r sorts reverse
  - -t, and -k sort the nth field (k), separated by ,

uniq

- `uniq` takes input and removes adjacent duplicates! (still simple, right?)

```
uniq <name of file>
cat <name of file> | uniq
```

- Common flags:
  - -c counts each unique line
  - -d reverses the meaning (prints only duplicates)

cut

- `cut` takes input and divides it into “columns”

```
cut -d<what to divide by> -f<which columns
you want> <name of file>
```

- Common flags:
  - -d what to divide by (“,” “ ” “tab”)
  - -c take n characters (-c1-10 takes first 10 characters in each line)
  - -f which columns you want:
    - -f1, first only
    - -f1-5 one through five
    - -f1,5 first and fifth only

Advanced Tools

- The following tools are more advanced and complicated
- You will often see them in online forums
- You don't have to be a wizard
- It is good to be familiar with them

(Once you are, there isn't a dataset you won't be able to manage)

- `grep` - regular expression search
- `sed` - search and replace patterns
- `awk` - counting as well as search

grep

- `grep` searches, line by line, for a pattern or "regular expression"
- Globally search a Regular Expression and Print

```
grep <pattern to find> <name of file>
```

- Common flags:
  - -i case-independent
  - -v reverse-search (all lines WITHOUT the pattern)
  - -c returns a count instead of the lines
  - -w surround the pattern with whitespace
  - -A or -B return pattern and n-lines after (A) or before (B)

sed

- `sed` searches and replaces a pattern
- Prints result to screen

```
sed ‘s,<old pattern>,<new pattern>,g’ <name of file>
```

- Common flags:
  - -i in-place, replaces the pattern in the file and overwrites
  - -i.bak in-place, same as above but saves the initial as originalfilename.bak

awk

- `awk` is very powerful and mysterious
- If I'm using it, it is likely from a google search
- To find the average of the second column:

```
cat <name of file> | awk ' sum += $2  END  if
(NR > 0) print sum / NR '
```

- "Add up column 2, if more than 1 row then print the sum divided by the rows"
- Great for advanced math (bash can, generally, only handle integers)

Revisiting the Datafile

- Emmy Winners 1949 to Present
- What did these commands do?

```
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Nonfiction,//g' | cut -d, -f4 > nominees.list
```

grep -

| -

sed -

cut -

> -

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- grep - search for 20##, in the Emmys file
- | - take output and feed it to sed
- sed - replace ", Nonfiction," with ""
- cut - pull out the 4th column, by commas
- > - write to file named nominees.list

Revisiting the Datafile

Answer the following:

How many Emmys was Netflix nominated for in 2015?

How many different shows?

Which show had the most?

How many Emmys has GoT been nominated for?

Revisiting the Datafile

Answer the following:

How many Emmys was Netflix nominated for in 2015? (15)

How many different shows? (7)

Which show had the most? (House of Cards - 6)

How many Emmys has GoT been nominated for? (105)

The End