# Unix command line; editors

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```
          kbroman.org
      github.com/kbroman
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Course web: kbroman.org/AdvData
```

Windows vs. Mac OSX vs. Linux

Remote vs. Not

# If you use Windows...

Consider Git Bash (or Cygwin)

(and perhaps Mintty or ComEmu)

# If you use a Mac...

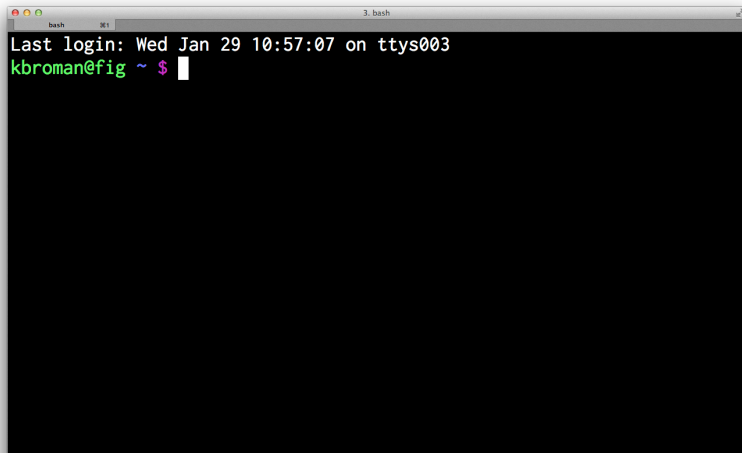Consider Homebrew and iTerm2

Also the XCode command line tools

# The command line is your friend

- ▶ Don't touch that mouse!

- ▶ Scriptable

- ▶ Flexible

# The shell



Options: tcsh, bash, zsh

# Basics

▶ Directory structure
Absolute vs. relative paths
```
ls -l ~/Figs ../Rawdata/
```

▶ Creating, removing, changing directories
```
mkdir
rmdir
cd
cd -
```

▶ Moving, copying, removing files
```
mv
cp
rm -i
```

# ~/.bash_profile

```
export PATH=.:/usr/local/bin:$PATH
export LD_LIBRARY_PATH=/usr/local/lib

noclobber=1     # prevent overwriting of files
IGNOREEOF=1     # disable Ctrl-D as a way to exit
HISTCONTROL=ignoredups

alias rm='rm -i'
alias mv='mv -i'
alias cp='cp -i'
alias ls='ls -GF'
alias 'l.'='ls -d .[a-zA-Z]*'
alias ll='ls -lh'
alias md='mkdir'
alias rd='rmdir'

alias Rb='R CMD build --force --resave-data'
alias Ri='R CMD INSTALL --library=/Users/kbroman/Rlibs'
alias Rc='R CMD check --library=/Users/kbroman/Rlibs'
alias Rcc='R CMD check --as-cran --library=/Users/kbroman/Rlibs'
```
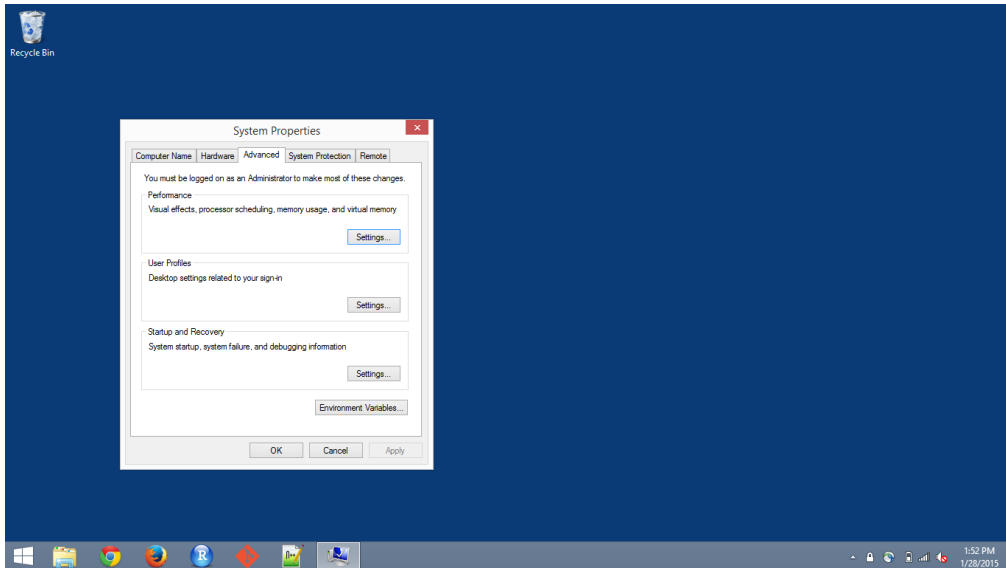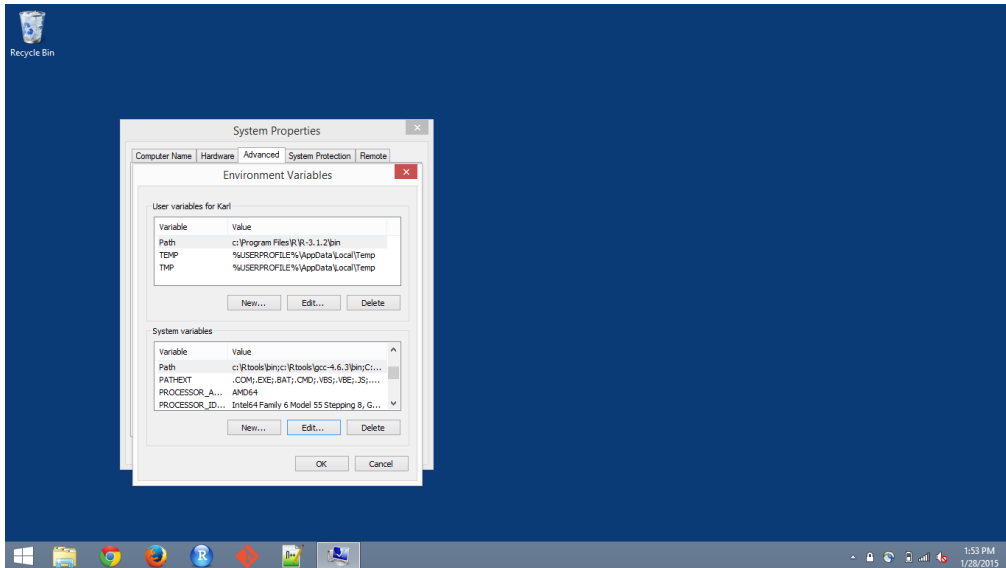
# PATH in Windows

# PATH in Windows

# PATH in Windows

# Redirection and pipes

```
$ curl -L http://bit.ly/hamlet_txt > hamlet.txt

$ wc -l hamlet.txt

$ grep Ham hamlet.txt > tmp.txt
$ wc -l tmp.txt

$ grep Ham hamlet.txt | wc -l

$ grep Ham hamlet.txt | less

$ cat file1.txt file2.txt > combined.txt
$ cat file3.txt >> combined.txt
```

# Wild cards

```
$ grep blah *.txt

$ ls blah.???

$ ls [a-z]*

$ ls /usr/bin/[auz]*

$ ls /usr/bin/[auz]*.*

$ ls -l *.txt | wc -l

$ wc -l *.txt | grep total
```

# Suspend/foreground/background

```
$ R CMD BATCH input.R output.txt &

$ R CMD BATCH input.R output.txt
[ctrl-Z]
$ bg

$ emacs afile.txt
[ctrl-Z]
$ fg
```

# Moving around the command line

| | |
|---|---|
| `ctrl-f, ctrl-b` | move forward and back |
| `ctrl-a, ctrl-e` | move to beginning and end of line |
| `ctrl-k, ctrl-u` | delete rest of line, or to the start |
| `ctrl-l` | clear the screen |
| `ctrl-c` | cancel what you've typed |
| `tab` | autocomplete command or file |
| `ctrl-p, ctrl-n` | forward and backward in history |
| `ctrl-r` | search for a previous command |

# How to solve computing problems

- Try stuff!
- man pages and help files
- `blah -h` or `blah --help`
- Google
- Stackoverflow and other StackExchange sites
- Google with `site:stackoverflow.com`
- email lists and google groups
- friends or colleagues
- Twitter
- Buy a book. Buy all of the books.

# Examples

- ► How do you suppress warnings in knitr?
- ► What symbol corresponds to the unicode `\u00B1`?
- ► What's the difference between `curl` and `wget`?
- ► What does "`502 Bad Gateway`" mean?
- ► "`To open gs you need to install X11`"
- ► `mclapply` isn't working in Windows
- ► How to ping a server in Python?
- ► `Font shape `EU1/pplx/m/n' undefined`
- ► `except KeyError, k: raise AttributeError, k`

# Important principle

Learn to code by looking at good code.

# Choose a good editor

- Emacs

- VIM

- RStudio

- Textwrangler

- Notepad++

- Sublime Text

- Atom

# A good editor

- ▶ Doesn't require pointing-and-clicking

- ▶ Easy to get code between R and a script

- ▶ Syntax highlighting of code

- ▶ Automatic indentation

- ▶ Close parentheses/brackets/braces

- ▶ Browse code across files

- ▶ Integrated with other tools (e.g., version control)

# Other useful tools

```
$ find . -name *.py
$ locate article.cls

$ ps ux

$ top

$ df -hk

$ du -h
$ du -hd2

$ ln -s ~/Projects/SomeFriend/Data
$ ln -s ~/Projects/SomeFriend/Data SomeFriend_Data

$ tar xzvf qtl_1.29-2.tar.gz
$ tar czvf blah.tgz Blah/
$ tar tzvf blah.tgz
```

# Further useful tools

```
$ whereis bash
$ type rm
$ type emacs

$ pwd

$ head afile.txt
$ tail afile.txt
$ head -n20 afile.txt
$ man head

$ kill 8453
$ kill -9 8453

$ history
$ !!
$ !-2
$ !503

$ ping www.google.com

$ ispell afile.txt
```

# Opening a file from the command line

Windows:

```
$ start mypaper.pdf
$ start http://google.com
```

Mac:

```
$ open mypaper.pdf
$ open http://google.com
```

# File modes

# File modes/owner/group

```
sudo chown kbroman .
chgrp -R staff .
chmod +x createVersionWithNotes.rb
chmod 755 02_Unix
chmod 644 02_Unix/02_unix.tex
chmod 700 Private_stuff
```

# Don't forget to look at the resources page

kbroman.org/AdvData/resources