

String Theory & Time Travel: **The Humble Text Editor**

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Who loves their text editor?



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Editor war

From Wikipedia, the free encyclopedia

For a type of conflict between Wikipedia editors, see [Wikipedia:Edit war](#).



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Editor war is the common name for the rivalry between users of the [Emacs](#) and [Vi \(Vim\)](#) text editors.

The rivalry has become a lasting part of [hacker culture](#) and the [free software community](#).

Many [flame wars](#) have been fought between groups insisting that their editor of choice is the [paragon](#) of editing [perfection](#), and insulting the others. Related battles have been fought over [operating systems](#), [programming languages](#), [version control](#) systems, and even source code [indent style](#).^{[1][2][3]}

Contents [hide]

1 Differences between Emacs and vi

1.1 Benefits of Emacs

**Has anyone here tried
to make their own editor?**

Why would a person
spend time trying to make
their own text editor?

*This talk is not about
showing off a text editor*

Summary

Travel through time!

Philosophy of Tools

Build a time machine

Semantics!

Everyone's favorite subject

Text Editor vs IDE

The screenshot shows an IDE interface with multiple windows and toolbars.

Project View: On the left, under the "Project" tab, there is a tree view of files. The file "recursive.sh" is selected. Other files listed include: rc.local.sh, rc.sh, rcS.sh, readahead-desktop.sh, readahead.sh, README, reboot.sh, resolvconf.sh, rmnlogin.sh, rsync.sh, saned.sh, screen-cleanup.sh, sendsigs.sh, single.sh, skeleton.sh, ssh.sh, stop-bootlogd-single.sh, stop-bootlogd.sh, stop-readahead.sh, supers.sh, sysklogd.sh, syslogd.sh, system-tools-backends.sh, Tesst.html, test.cs, test.erl, Test.sh, and test1.sh.

Code Editors: There are two main code editors.

- recursive.sh:** This editor contains a shell script. It includes a function "fact" that calculates the factorial of a number using recursion. It also includes a "fact \$1" command and an "exit 0" command at the end.
- sysklogd.sh:** This editor contains a shell script. It handles the configuration of the sysklogd service, including setting the user and running it via /lib/lsb/init-functions.

Run Tab: At the bottom, the "Run" tab is active, showing the command: "/bin/bash /Volumes/DATA/IdeaProjects/BashTest/Test/src/Test/recursive.sh 5".

Output Tab: The output pane shows the result of the script execution: "Factorial of 5 is 120." and "Process finished with exit code 0".

```
recursive.sh x sysklogd.sh x recursive.sh x sysklogd.sh x

echo "out of range (0 is maximum)."
# Let's get real now.
# If you want greater range than this,
# rewrite it in a real programming language.
echo $A=1
echo $factorial
exit ${_RANGE_ERR}
fi

echo $Aabc

fact () {
    local number=$1
    # Var number      to be declared as local,
    # otherwise this doesn't work.
    if [ "$number" -eq 0 ]
    then
        factorial=1    # Factorial of 0 = 1.
    else
        let "decrnum = number - 1"
        fact $decrnum # Recursive function call.
        let "factorial = $number * $?"
    fi

    return $factorial
}

fact $1
echo "Factorial of $1 is $?"
exit 0

test -x $binpath || exit 0

# syslogd options should be set in /etc/default/syslogd
SYSLOGD=""

# user to run syslogd as - this can be overridden in /etc/default/syslogd
USER="syslog"

test ! -r /etc/default/syslogd || . /etc/default/syslogd

# allow ltsp to override
test ! -r /etc/ltsp/syslogd || . /etc/ltsp/syslogd

# Add unbound chroot if it's installed
test ! -r /etc/unbound/syslogd || . /etc/unbound/syslogd

# Figure out under which user syslogd should be running as
if echo ${SYSLOGD} | grep -q '^.*-u[[:space:]]*\([[:alnum:]]*\)[[:space:]]*'
then
    # A specific user has been set on the command line, try to extract
    USER=$(echo ${SYSLOGD} | sed -e 's/^.*-u[[:space:]]*\([[:alnum:]]*\)[[:space:]].*')
else
    # By default, run syslogd under the syslog user
    SYSLOGD="${SYSLOGD} -u ${USER}"
fi

# Unable to get the user under which syslogd should be running, stop.
if [ -z "${USER}" ]
then
    log_failure_msg "Unable to get syslog user"
    exit 1
fi

. /lib/lsb/init-functions
```

 Untitled - Notepad  

File Edit Format View Help

|

At the Dawn of Time







TECO

@^UB#@S/{ ^EQQ,/#@^UC#@S/, ^EQQ}/@-1S/{ /#@^UR#.U1ZJQZ
\\^SC., .+-^SXQ-^SDQ1J#@^U9/[]-+<>. , /<@:-FD/
^N^EG9/ ;>J30000<0@I//>ZJZUL30000J0U10U20U30U60U7@^U4/
[]/@^U5#<@:S/^EG4/U7Q7;-AU3(Q3-91)"=%1 |Q1"=.U6ZJ@i/{/
Q2\@i/,/Q6\@i/}/Q6J0; '-1%1'>#<@:S/[/
UT.U210^T13^TQT;QT"NM5Q2J'>0UP30000J.US.UI<(0A-43)"=QPJ
0AUTDQT+1@I//QIJ@0/end/ '(0A-45)"=QPJ0AUTDQT-1@I//QIJ@0/
end/ '(0A-60)"=QP-1UP@0/end/ '(0A-62)"=QP+1UP@0/
end/ '(0A-46)"=-.+QPA^T(-.+QPA-10)"=13^T '@0/
end/ '(0A-44)"=^TUT8^TQPJDQT@I//QIJ@0/end/ '(0A-91)"=-.
+QPA"=QI+1UZQLJMRMB\ -1J.UI '@0/end/ '(0A-93)"=-.+QPA"NQI
+1UZQLJMRMC\ -1J.UI '@0/end/ '!end!QI+1UI(. -Z)"=.=@^a/END/
^C^C'C>

UNIX

ed

```
$ ed example_file
```

```
1729
```

```
42
```

```
def life_the_universe_and_everything
```

```
42,44
```

```
end
```

```
10,9001p
```

```
?
```

```
h
```

```
Invalid Address
```

sed

Ugly,
but made for professionals

Modal vs Modeless

Hand Tools vs Wizards

Let's say we have to
cut some wood



Nokogiri





How To Choose:

Outdoor Security Lighting

Choose an Application

For motion-activated lights

Dual Detection

- Occupied Radiation is a second location

Wireless Motion

- Express wireless light in a second location

Solar Powered

- No wiring needed, sunny days charge battery

Standard

- Standard motion sensor activates the light

Detachable mount • Motion sensor

Use portable to control storage use

For adjustable activation

Multiple Settings

- Motion activated
- Timer shut off

The standard activation

Switched

- Activates with a single switch and neutral

The standard activation

Dusk to Dawn

- Automatically turns on at dusk or off at dawn

Don't Forget!

Automatically turn off after specified time period

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Automatically turn off after specified time period

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Automatically turn off after specified time period

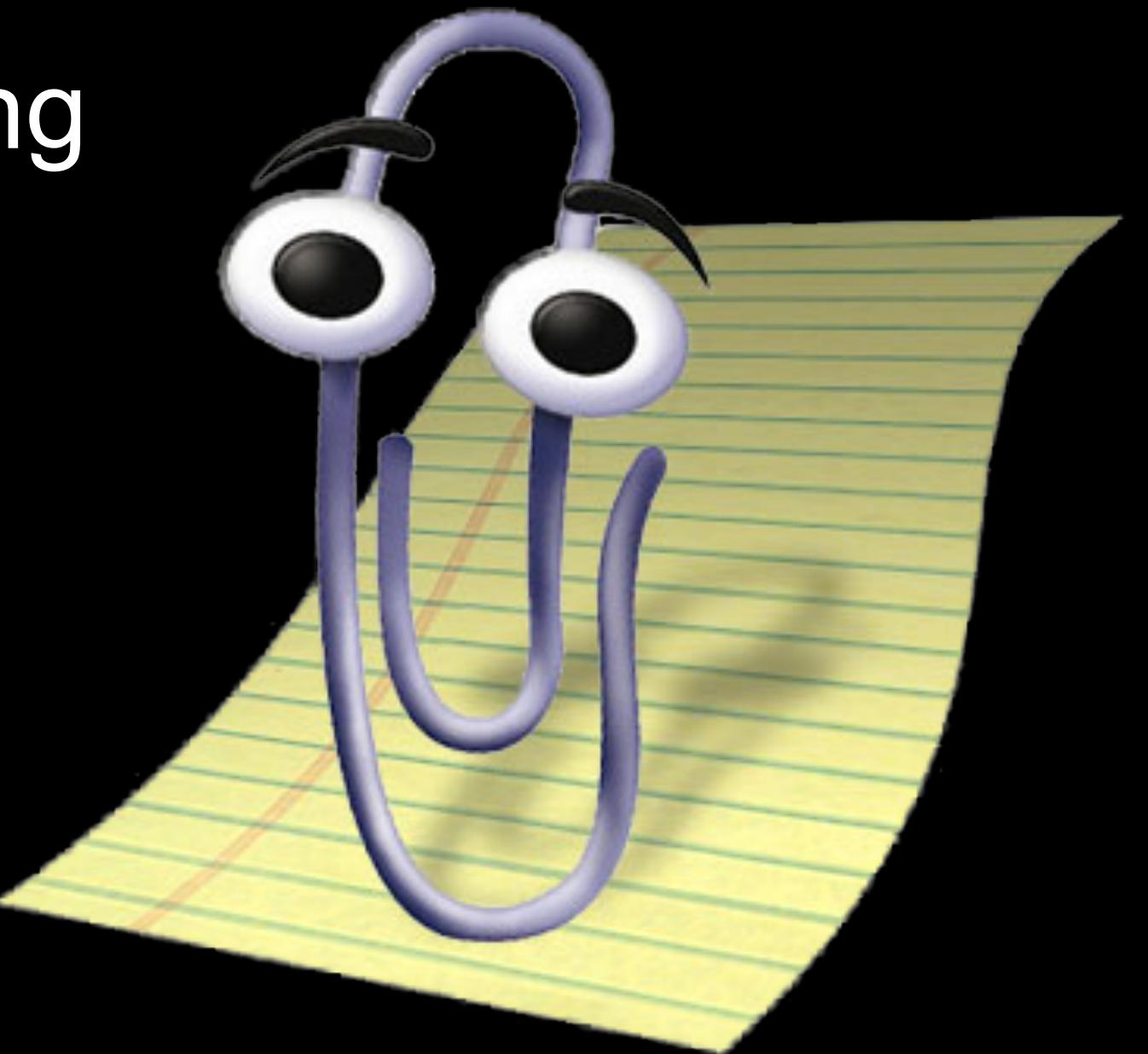
Don't Forget!

Automatically turn off after specified time period

Wizards can be terrible

It looks like you are trying to make
a very dated joke.

Would you like some help beating
that dead horse?



Wizards can be great



Java - ffserver.c - Eclipse SDK

File Edit Source Refactor Navigate Search Project Run Window Help

Package Explorer

ffserver.c

Outline

Problems Javadoc Declaration Console

CDT Build Console [ffmpeg]

```
for (s = first_stream; s; s = s->next) {
    if (!strcmp(stream->filename, s->filename)) {
        ERROR("Stream '%s' already registered\n", s->filename);
    }

    stream->fmt = ffserver_guess_format(NULL, stream->filename, NULL);
    avcodec_get_context_defaults2(&video_enc, AVMEDIA_TYPE_VIDEO);
    avcodec_get_context_defaults2(&audio_enc, AVMEDIA_TYPE_AUDIO);

    audio_id = CODEC_ID_NONE;
    video_id = CODEC_ID_NONE;
    if (stream->fmt) {
        audio_id = stream->fmt->audio_codec;
        video_id = stream->fmt->video_codec;
    }

    *last_stream = stream;
    last_stream = &stream->next;
}
} else if (!av_strcasecmp(cmd, "Feed")) {
    get_arg(arg, sizeof(arg), &p);
    if (stream) {
        FFStream *sfeed;
```

ffserver.c:3454:13: warning: 'url_close' is deprecated (declared at libavformat/avio.h:224) [-Wdeprecated-declarations]
ffserver.c: In function 'add_av_stream1':
ffserver.c:3491:5: warning: 'av_set_pts_info' is deprecated (declared at libavformat/avformat.h:1666) [-Wdeprecated-declarations]
ffserver.c: In function 'parse_ffconfig':
ffserver.c:4236:17: warning: 'avcodec_get_context_defaults2' is deprecated (declared at ./libavcodec/avcodec.h:3917) [-Wdeprecated-declarations]
ffserver.c:4237:17: warning: 'avcodec_get_context_defaults2' is deprecated (declared at ./libavcodec/avcodec.h:3917) [-Wdeprecated-declarations]
LD ffserver_g
CP ffserver
STRIP ffserver
**** Build Finished ****

Hand tools can be great

git

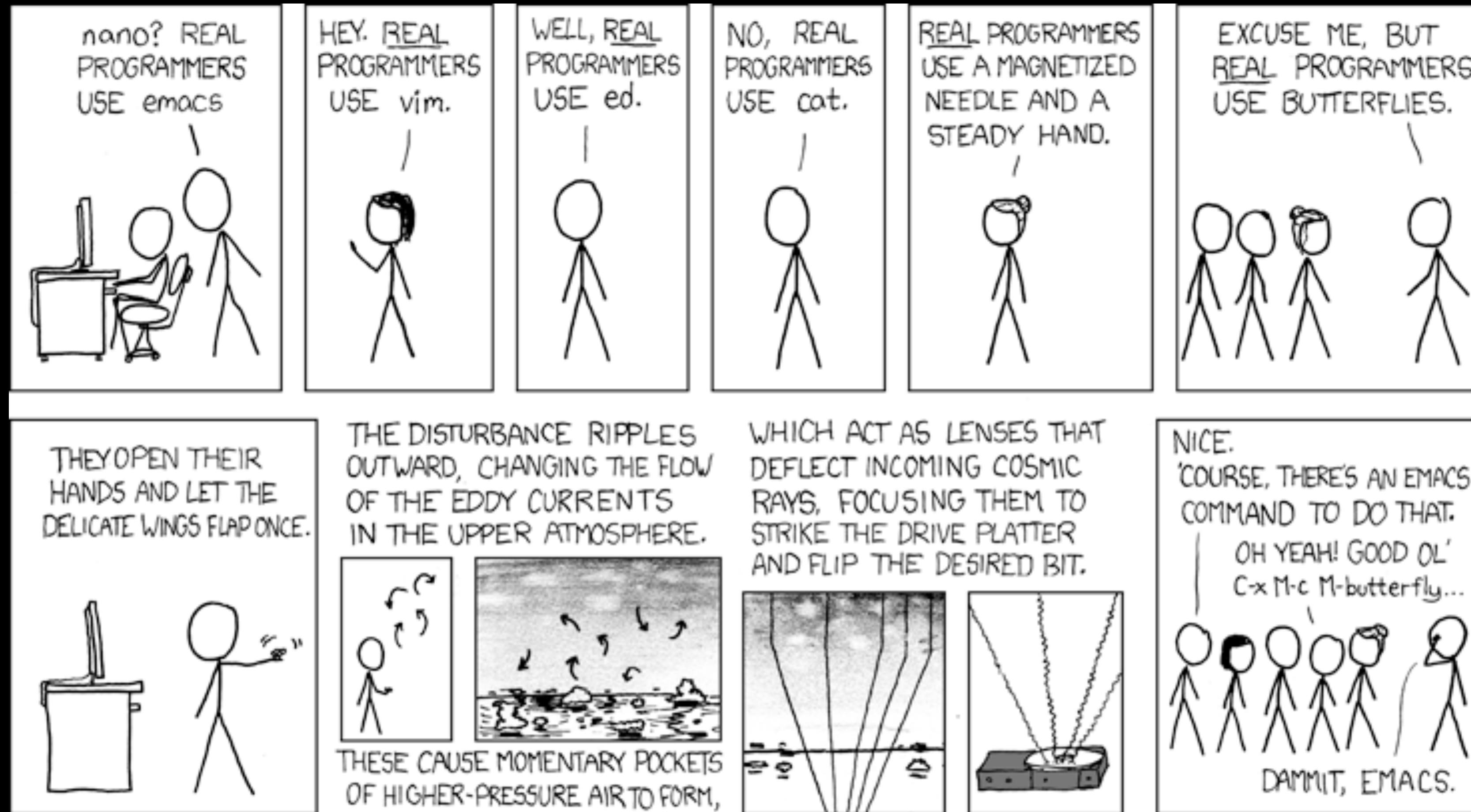
Hand tools can be terrible

git

**Another advantage
of hand tools ...**

Wizards do magic *for* you

Hand tools make *you*
feel like a wizard



XKCD #378

Hover text: “Real programmers set the universal constants at the start such that the universe evolves to contain the disk with the data they want.”

The right tool
for the right job

**Wizards and hand tools are
not mutually exclusive ...**

The power of hand tools is
why old editors **still** have
their place

ed

ex

vi

vim

TECO

emacs

We can do better!



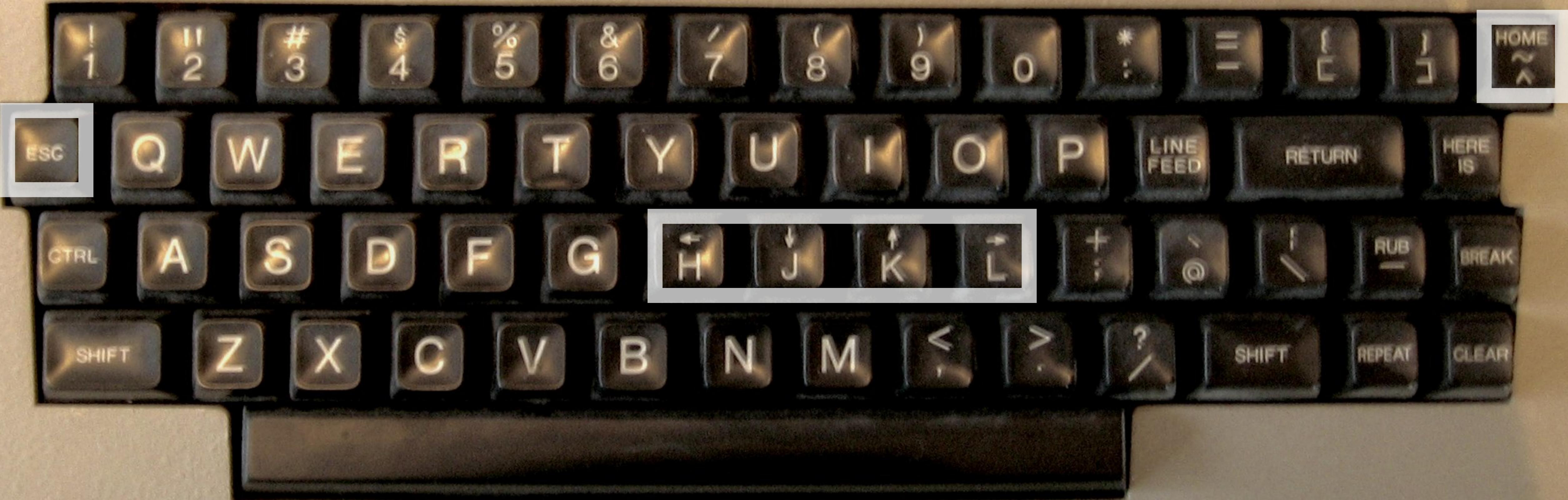


Example improvements

Better command syntax



ADM-3a



Single Responsibility Principle
Composability
Higher Order Abstractions
Static Typing / Documentation

**Selection
Modification
Editing**

Better extensions
and scripting

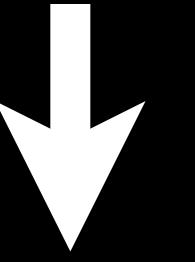
Ruby!

```
delete 'd',
  'Delete the current selection. If a string is given,
  replace the current selections with that string.',
  String do |text = ''|
    current_selections.replace(text)
end

select 's',
  'Select whatever arguments are given. Numbers select lines,
  Ranges select multiple lines, strings select matching strings,
  and Regular Expressions select matching patterns.',
  [String, Regexp, Numeric, Range] do |*queries|
    queries.each do |query|
      case query
      when String
        current_document.select_string(query)
      when Regexp
        current_document.select_regexp(query)
      when Range
        current_document.select_lines(query)
      when Numeric
        current_document.select_lines(query..query)
      end
    end
  end
```

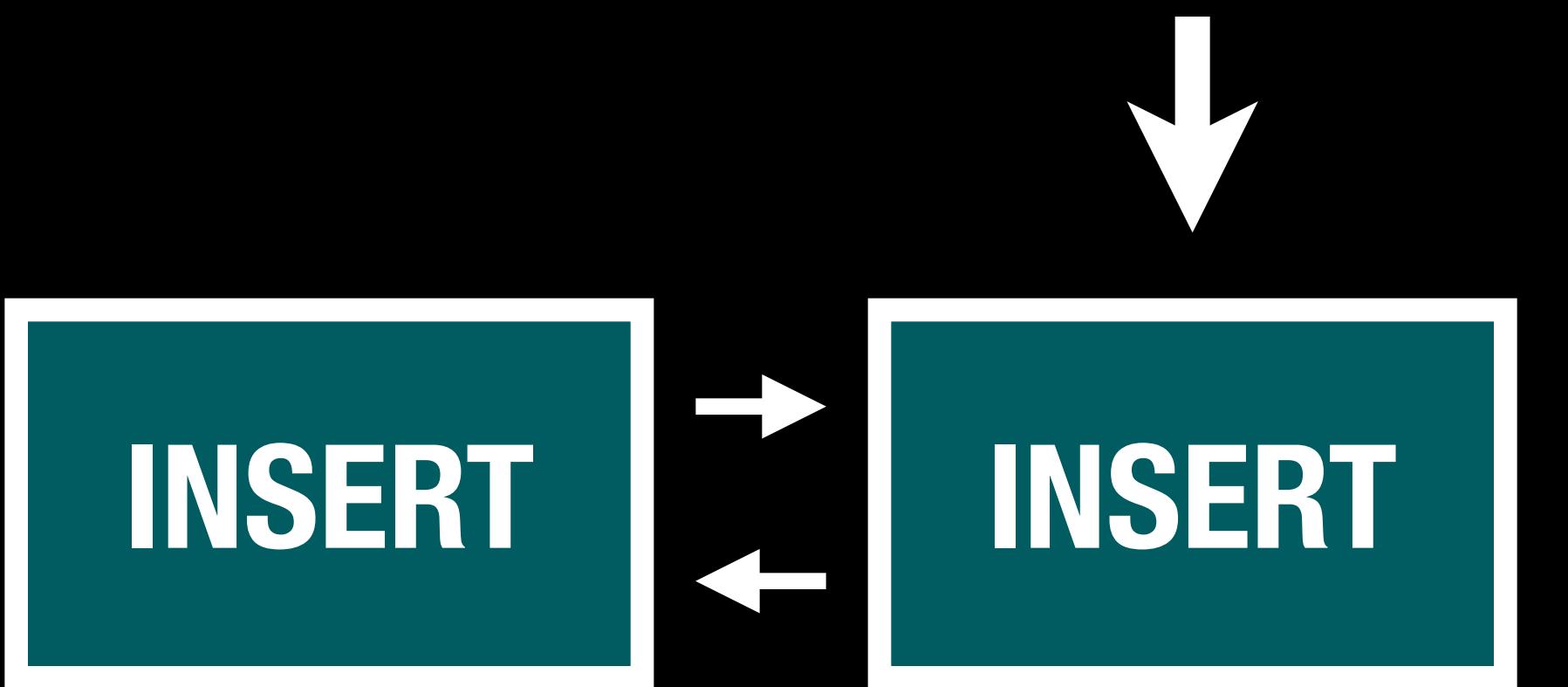
The time machine in your
editor may be **broken**

Edit history is
a magical feature

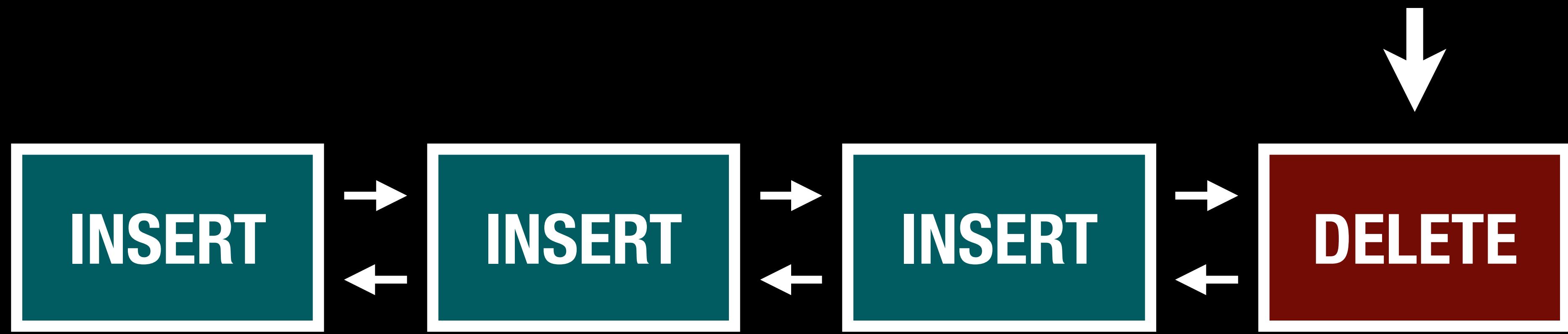


INSERT

A teal rectangular button with a thin white border and white text that reads "INSERT".

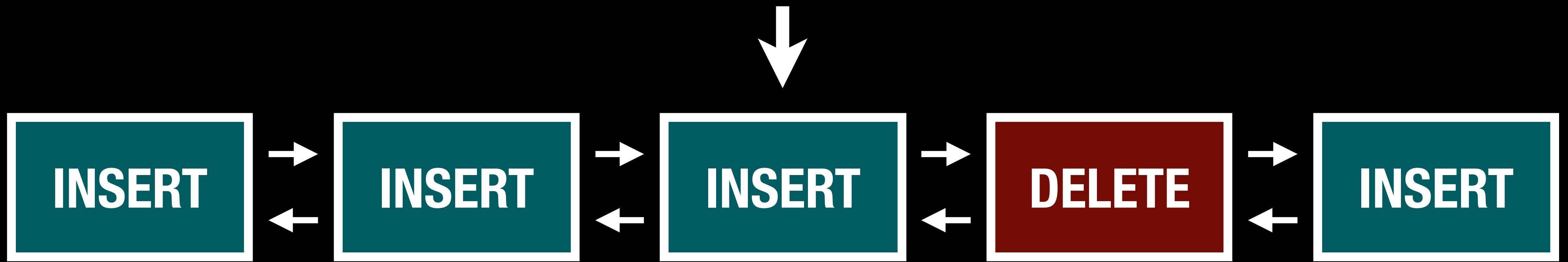














```
module HistoryStep
  def initialize
    @previous = self
    @next     = self
  end

  def next
    perform_undo
    @next
  end

  def previous
    perform_redo
    @previous
  end
end
```

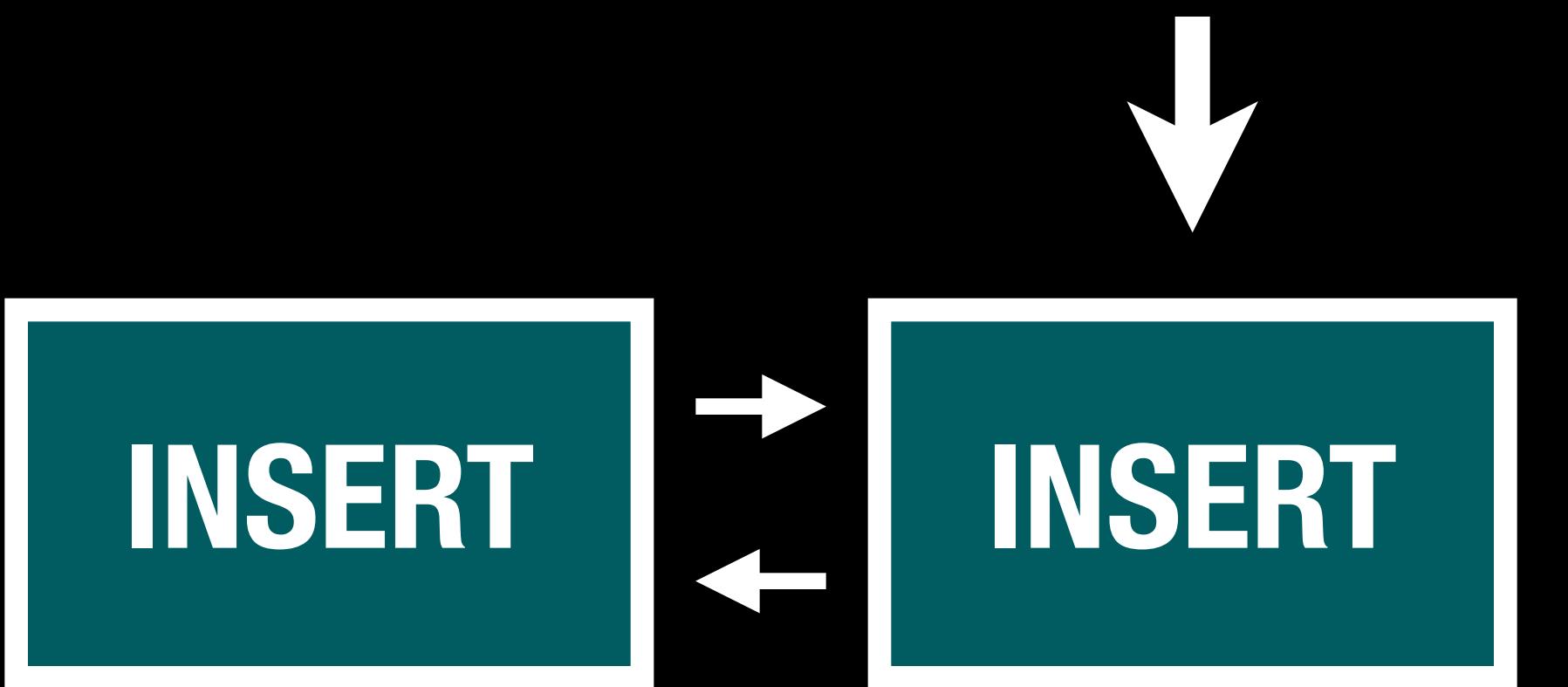
```
module HistoryStep
  def set_next(next_step)
    next_step.set_previous(self)
    @next = next_step
  end
```

protected

```
def set_previous(prev_step)
  @previous = prev_step
end
end
```

A terrible bug

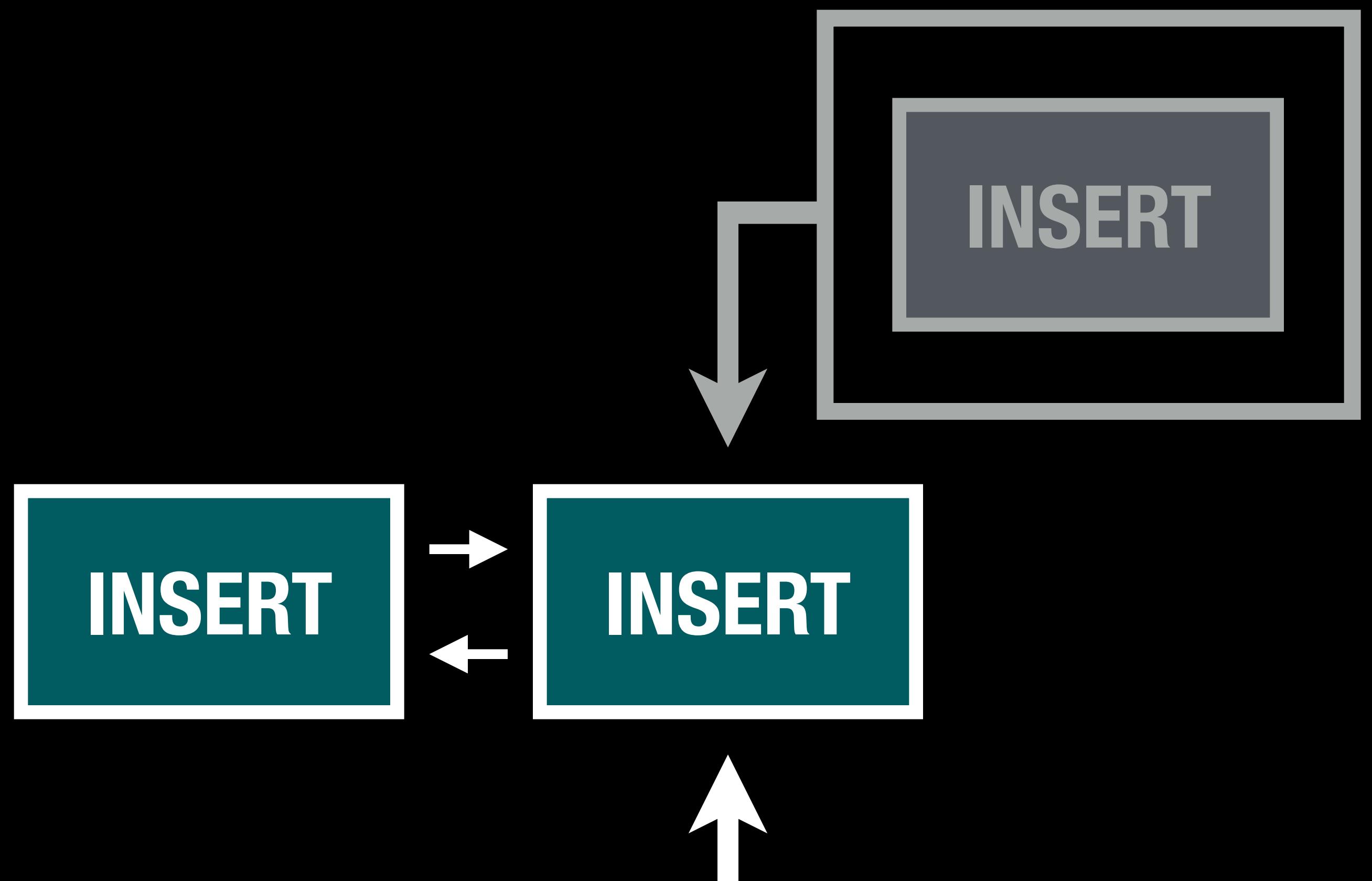


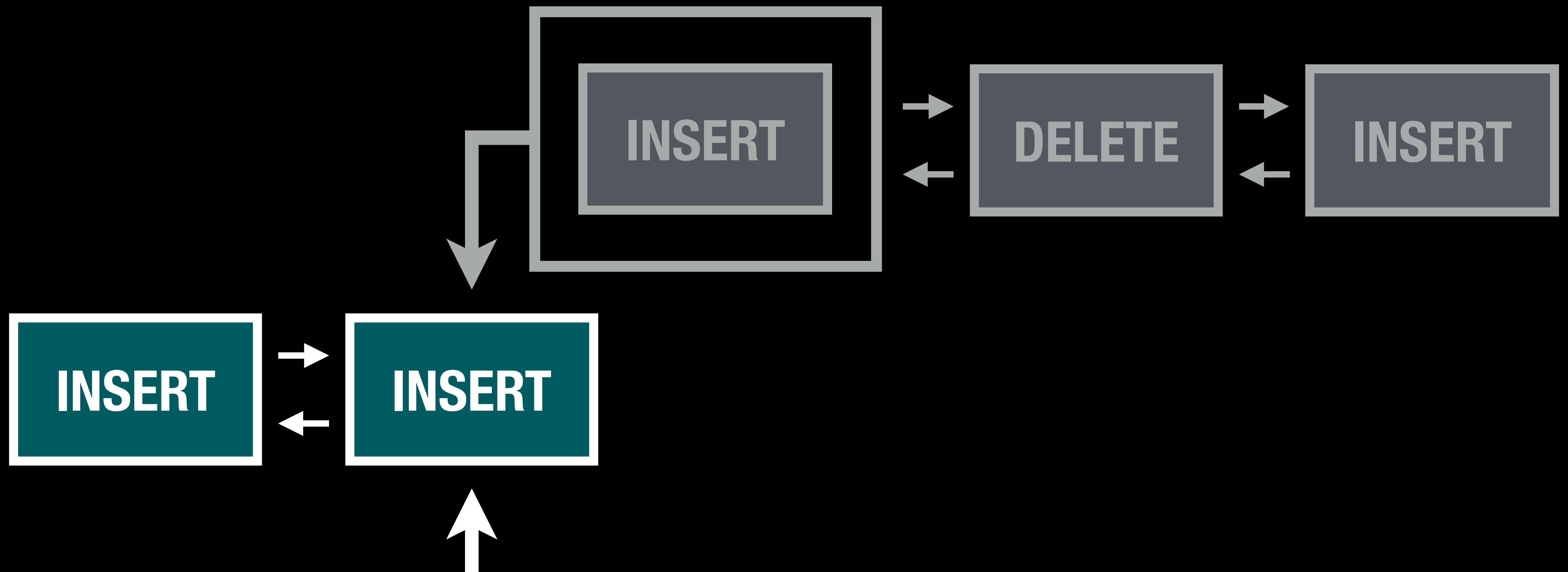


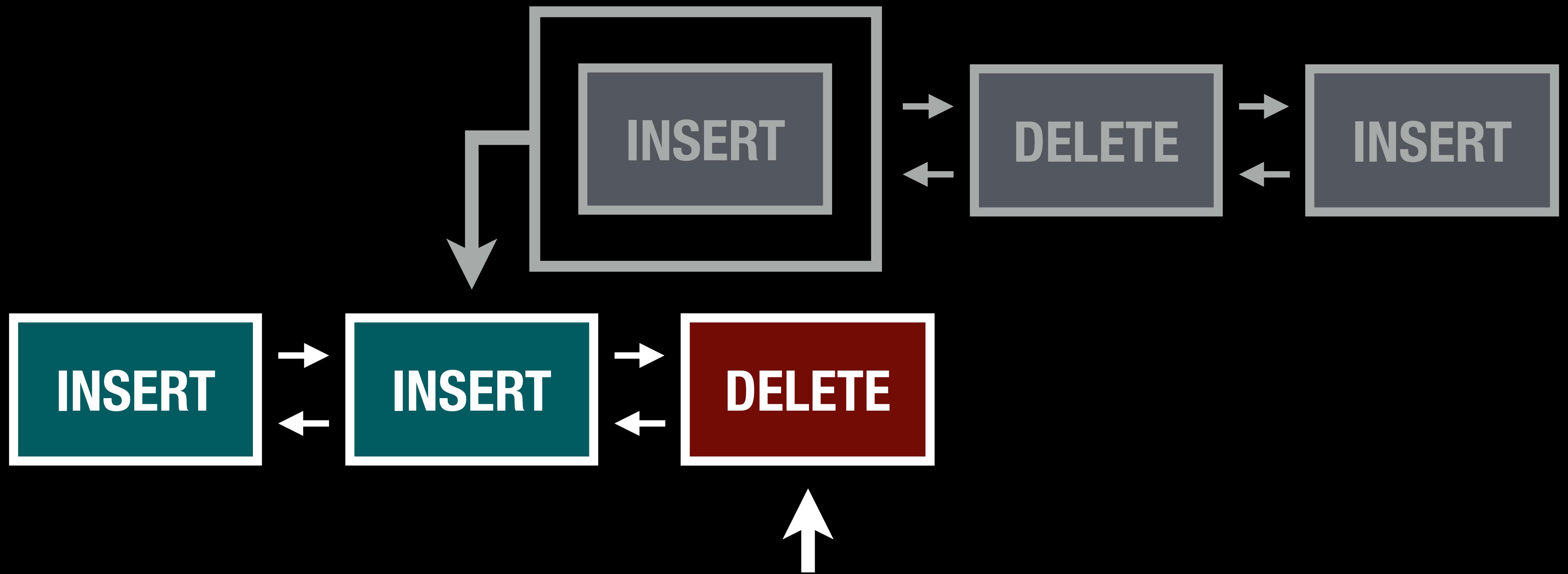


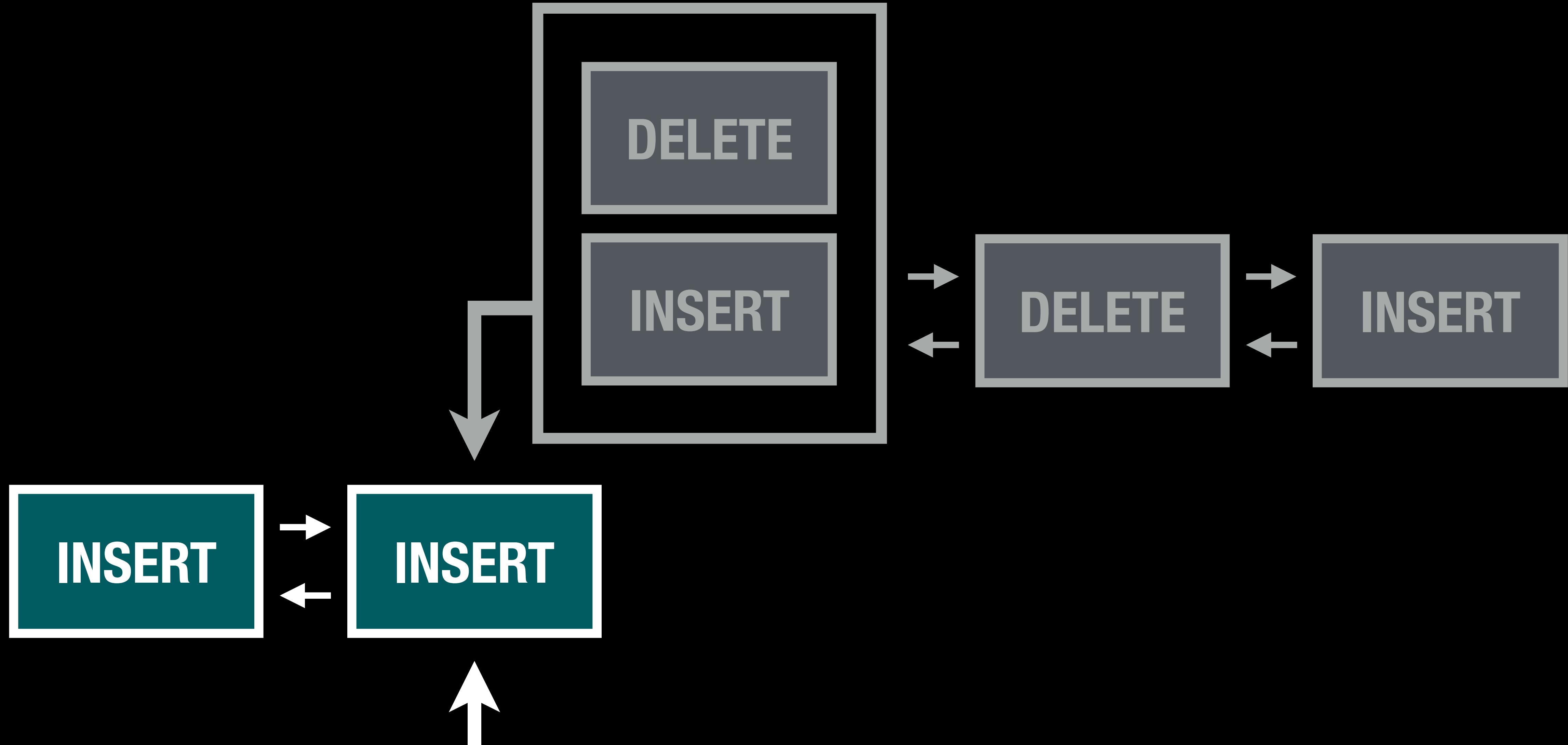
Branched History

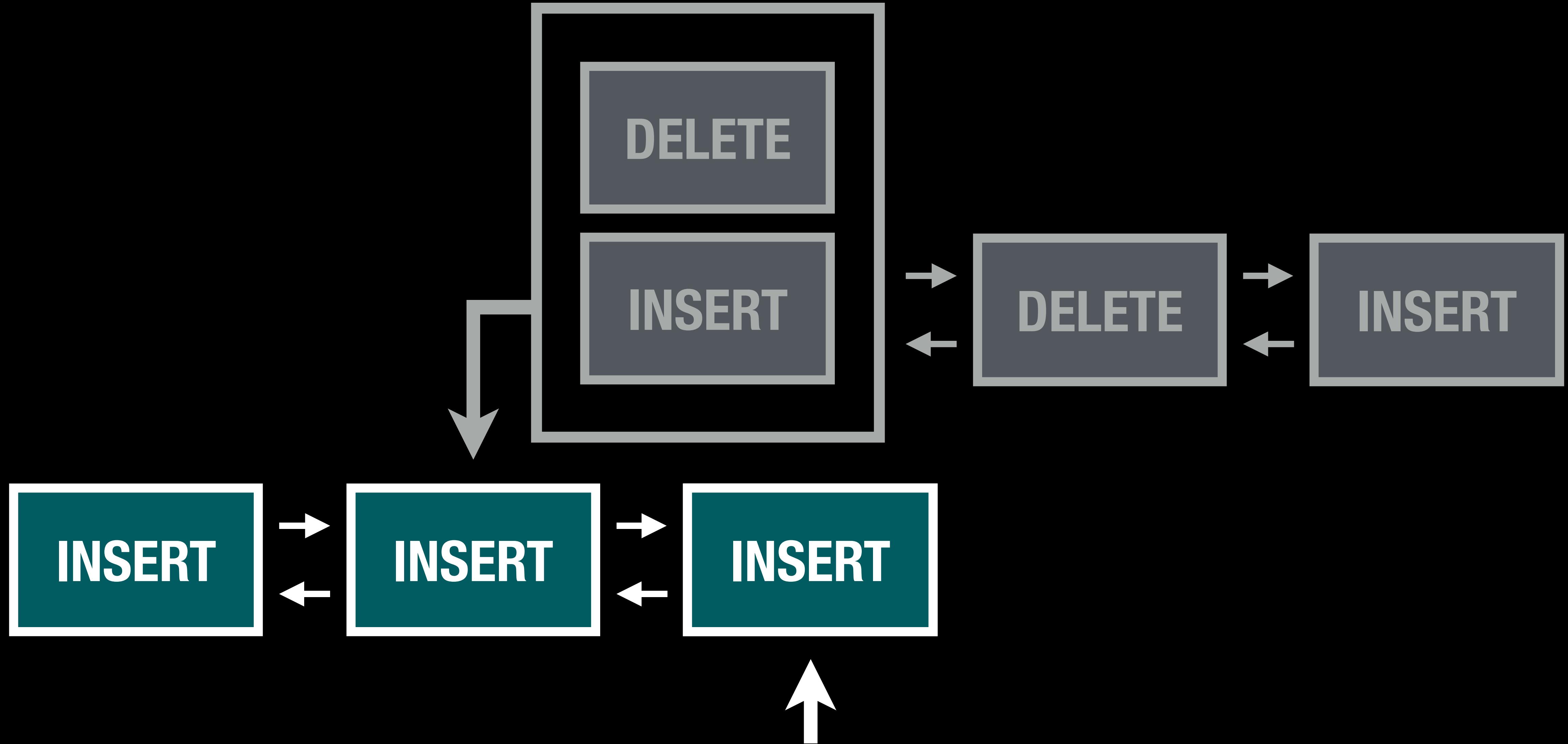












```
module HistoryStep
  def initialize
    @previous = self
    @next = self
    @alternates = []
  end

  def set_next(next_step)
    @alternates << @next unless @next == self

    next_step.set_previous(self)
    @next = next_step
  end

  def alternative_next
    @alternates << @next

    @next = @alternates.shift
  end
end
```

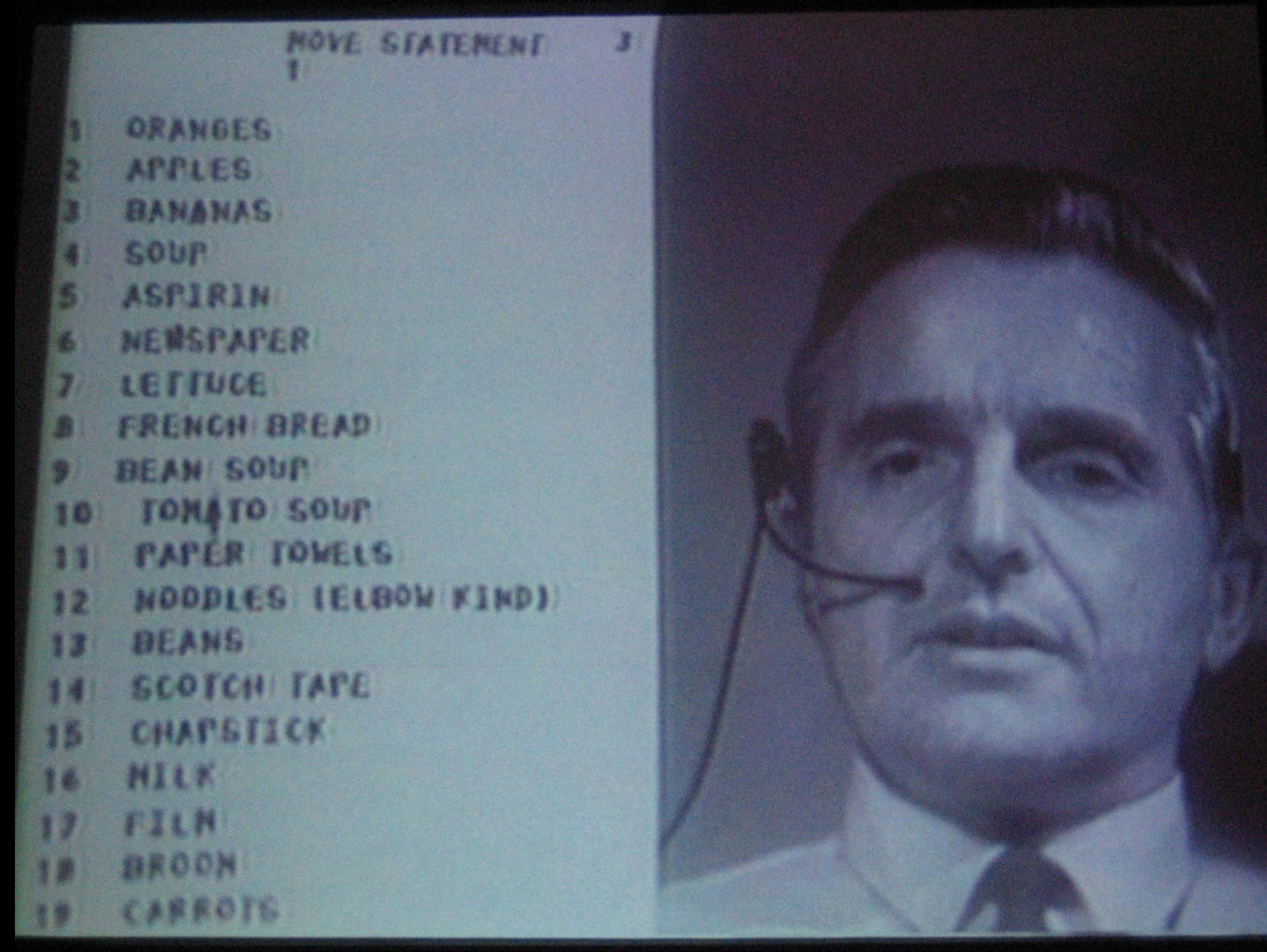
More Persistance

Learn from our history

Jef Raskin







Douglas Engelbart
“The Mother of All Demos”

Jef Raskin

It's not hard to see why The Canon Cat is so easy.

MEMORY GAUGE

Always lets you know how much room you have left in your Cat.

HIGHLIGHTING

Points out the text you want to do something with.

PRINT

Lets you do just that—with a variety of Canon Printers.

EXPLAIN

Answers your questions about The Canon Cat.

CALC

Lets you calculate.

COPY

Lets you copy any amount of text.

LEARN

Lets The Cat automatically do any repetitive task you want it to do.

LEAP

Lets you get where you want to be—instantly.



BUILT-IN MICRO FLOPPY DISK DRIVE

Allows you to store approximately 80 pages of text on a 3.5" disk.

DISK

Lets you record what you've typed, or play it back.

SPELL CHECKER*

Uses 90,000 words from The American Heritage Dictionary and 450 from you to catch spelling and typing errors.

UNDO

Undoes the last thing you've done, so you can change your mind.

PHONE

Lets you automatically dial phone numbers.

SEND

Lets you communicate with other Cats or other computers.

SORT

Lets you arrange in alphabetical or numerical order numbers, words, sentences and paragraphs.

Rob Pike

sam

Structural Regular Expressions



Plan 9 from Bell Labs





Plan 9 from Bell Labs

acme

win Newcol Kill Putall Dump Exit

New Cut Paste Snarf Sort Zerox Delcol

/usr/maht/-grr Del Snarf | Look Send Noscroll

term% ftpfs ftp.proweb.co.uk

220 Welcome to Proweb Web Server (Jerry)

331 Please specify the password.

230 Login successful.

215 UNIX Type: L8

257 "/"

term% cat /dev/window | topng > /n/ftp/www/acme_screeny.png

[

Del Snarf Undo | Look

This image is in the Public Domain

/usr/maht/ Del Snarf Get | Look

386/	freetype-plan9.tgz	momo/
abaco.tgz	freetype/	radio
abaco/	hugs-p9/	radios
acme.dump	hugs.tgz	sys/
acme_screen.png	lib/	tmp/
bin/	mad.tgz	window
freetype-2.1.4/	madplay/	

/usr/maht/lib/plumbing Del Snarf | Look

to update: cp /usr/maht/lib/plumbing /mnt/plumb/rules

editor = acme

include basic

type is text

data matches '([a-zA-Z_-\!0-9_\-.]/+)' on line ([0-9]+)\$'

arg isfile '/n/momo/var/www/\$1'

data set \$file

attr add addr=\$2

plumb to edit

plumb client \$editor

type is text

data matches '([a-zA-Z_-\!0-9_\-.]/+)\.(classlinc)'

arg isfile '/n/momo/var/www/php/\$1'

data set \$file

plumb to edit

New Cut Paste Snarf Sort Zerox Delcol

+Errors Del Snarf | Look

NAME

acme, win, awd – interactive text windows

SYNOPSIS

acme [-ab] [-c ncol] [-f varfont] [-F fixfont] [-l
loadfile | file ...]

win [command]

awd [label]

DESCRIPTION

Acme manages windows of text that may be edited interactively or by external programs. The interactive interface uses the keyboard and mouse; external programs use a set of files served by acme; these are discussed in acme(4).

Any named files are read into acme windows before acme accepts input. With the -l option, the state of the entire system is loaded from loadfile, which should have been created by a Dump command (q.v.), and subsequent file names are ignored. Plain files display as text; directories display as columnated lists of the names of their components, as in ls -p directory|mc except that the names of subdirectories have a slash appended.

The -f (-F) option sets the main font, usually variable-pitch (alternate, usually fixed-pitch); the default is /lib/font/bit/lucidasans/euro.8.font (.../lucm/unicode.9.font). Tab intervals are set to the width of 4 (or the value of \$tabstop) numeral zeros in the appropriate font.

Windows

Acme windows are in two parts: a one-line tag above a multi-line body. The body typically contains an image of a file, as in sam(1), or the output of a program, as in an rio(1) window. The tag contains a number of blank-separated words, followed by a vertical bar character, followed by anything. The first word is the name of the window, typically the name of the associated file or directory, and the other words are commands available in that window. Any text may be added after the bar; examples are strings to search for or commands to execute in that window. Changes to the text left of the bar will be ignored, unless the result is to change the name of the window.

Rob Pike
Ken Thompson
Dennis Ritchie
Brian Kernighan
Bjarne Stroustrup

Plan 9 from User Space

Take Aways

Take some time to design
development tools

Rails is like a wizard

**Sinatra & Rack are
more hand tool**

Try building
your own editor

I/O
Data Structures
Interface Design
Threads
Software Architecture

Take some time and try a
new (**to you**) editor

We stand on
the shoulders of giants

justcollin on Github

Thank you!