- Tool of the week
- Request of the week
- Homework

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cat - concatenate files and print on the standard output

> cat example.txt
This is the first line with three spaces at the end.
This is the second line containing TAB characters.
This line contains some garbage.

There are some empty lines around this one.

```
-n, --number
  number all output lines
```

```
> cat --number example.txt
```

- 1 This is the first line with three spaces at the end.
- 2 This is the second line containing TAB characters.
- 3 This line contains some garbage.

5 There are some empty lines around this one.

6

7

8

- -b, --number-nonblank
   number nonempty output lines, overrides -n
- > cat --number-nonblank example.txt
  - 1 This is the first line with three spaces at the end.
  - 2 This is the second line containing TAB characters.
  - 3 This line contains some garbage.
  - 4 There are some empty lines around this one.

-s, --squeeze-blank
 suppress repeated empty output lines

> cat --squeeze-blank example.txt
This is the first line with three spaces at the end.
This is the second line containing TAB characters.
This line contains some garbage.

There are some empty lines around this one.

- --squeeze-blank
- --number
- > cat --squeeze-blank --number example.txt
  - 1 This is the first line with three spaces at the end.
  - 2 This is the second line containing TAB characters.
  - 3 This line contains some garbage.

5 There are some empty lines around this one.

6

7 Finally, this is the last line.

Following the Unix-philosophy this should look something like this:

> cat example.txt | sqz | nbr

cat f - g Output f's contents, then standard input, then g's contents.

Redirection allows commands' file handles to be duplicated, opened, closed, made to refer to different files, and can change the files the command reads from and writes to.

Redirecting Output: [n]>word word to be opened for writing on file descriptor n, or the standard output (filedescriptor 1) if n is not specified. If the file does not exist it is created; if it does exist it is truncated to zero size. Note the noclobber option.

[demo]

Reference:

man bash

A variant of here documents, the format is: <<<word

The word undergoes ... expansions, then the result is supplied as a single string to the command on its standard input.

> cat first.txt - second.txt > result.txt <<< "This is something in between."</pre>

the second file.

- Tool of the week
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screen - screen manager with VT100/ANSI terminal emulation

[GNU screen]

### References:

- man screen or
- https://www.gnu.org/software/screen/manual/screen.html

screen - screen manager with VT100/ANSI terminal emulation

A computer terminal is an electronic or electromechanical hardware device that is used for entering data into, and displaying data from, a computer or a computing system.

The term terminal covers all remote terminals, including graphical interfaces.

[DEC VT100]

### Reference:

• https://en.wikipedia.org/wiki/Computer terminal

screen - screen manager with VT100/ANSI terminal emulation

emulates a video terminal within some other display architecture

terminal window ≅ terminal emulator inside a GUI

Some character-oriented terminal emulators:

- Linux
  - Linux terminal (text mode, framebuffer) [VT subsystem of the Linux kernel]
- X Window terminals (1984, MIT)
  - xterm (1984, emulates VT220 and Tektronix 4010)
  - xvt (1992, emulates VT100 for the X window system)
  - rxvt (1997?, emulates VT102, ouR XVT)
  - konsole (1998?, KDE Project)
  - gnome-terminal (1999?, emulates xterm, GNOME Project)

emulates a video terminal within some other display architecture terminal window ≅ terminal emulator inside a GUI

Some character-oriented terminal emulators (continued):

- Command-line interface
  - GNU screen (1987, terminal multiplexer)
  - tmux (2007, includes most features of GNU screen)
- Others (for MS-DOS, Microsoft Windows, macOS, etc.)

There are block-oriented terminal emulators, too.

#### References:

- https://en.wikipedia.org/wiki/Terminal\_emulator
- https://en.wikipedia.org/wiki/List\_of\_terminal\_emulators

screen - screen manager with VT100/ANSI terminal emulation

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VT100: video terminal, introduced in 1978 by DEC

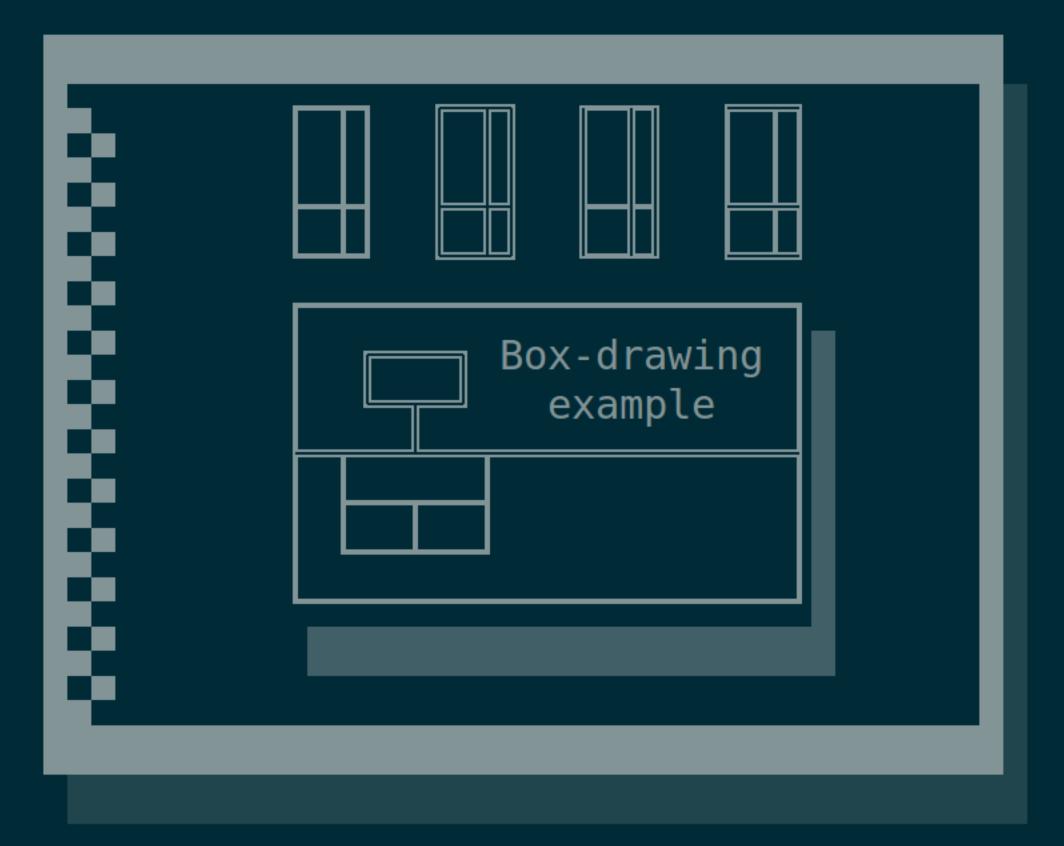
- 132 columns and 24 rows
- ANSI X3.64 standard for command codes
  - blinking, bolding, reverse video, and underlining
  - box-drawing character set
     Esc ( 0 switched the codes for lower-case ASCII letters to draw this set, and the sequence Esc ( B switched back.

### References:

• https://en.wikipedia.org/wiki/VT100

### References:

- https://en.wikipedia.org/wiki/Box-drawing\_character
- https://en.wikipedia.org/wiki/ANSI escape code
- https://en.wikipedia.org/wiki/ASCII art



http://artscene.textfiles.com/vt100/

[demo]

Use wget and pv to play these animations.
wget: non-interactive network downloader
pv: monitor the progress of data through a pipe (has rate limiting option)

### Reference:

http://artscene.textfiles.com/vt100/

- screen -S <name>
- screen -ls
- screen -x
- screen -r <name>
- screen -dRR

start session with name

list running sessions

attach to a running session

attach to session with name

ultimate attach (reattach a session and if necessary

detach or create it, use the first session if

more than one session is available)

### Reference:

• http://aperiodic.net/screen/quick reference

- screen -c file

use file as the configuration file instead of the default \$HOME/.screenrc • screen -U run screen in UTF-8 mode

• screen -T set \$TERM environment variable

### Example:

screen -U -dRR -c \$HOME/.screenrc.test -T screen-256color

## \_\(\[ \] (\] (\] |

## 

Customizable command character: each command begins with a Control-a (CTRL-a, C-a, ^A or ^a) keystroke.

### Reference:

https://www.gnu.org/software/screen/manual/screen.html#Command-Character

## \_\(\_|\_(/\_\_(/\_\_|\_

# 

### Help

list keybindings

C-a ?

### \_\(\_|\_(/\_\_(/\_\_|\_

## 

### Getting out

- exit session
- detach
- detach and logout
- exit screen
- force-exit screen

```
exit (or C-d) in all windows,
after closing all applications
in each window
C-a d
C-a D D
C-a \ (not recommended)
```

C-a C-\ (not recommended)

### \_\(\_|\_(/\_\_|\_|

# 

### Window management

### Create

new window

### C-a c

### Destroy

- current window
- all windows

C-a k (not recommended)

C-a \ (not recommended)

## \_\(\[ \] (\] (\] \_

## 

### Window management

### Change to

- last-visited active window C-a C-a
- window by number
   C-a < number>
- window by number or name C-a '
- previous window in list C-a p or C-a <backspace>
- chosen window from list

next window in list
 C-a n or C-a <space>

C-a " (lists windows, then you can choose)

Rename current window

C-a A

## \_\(\_|\_(/\_\_|\_\_|

# 

- Tool of the week
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- What does the -A option do?
- What is the long name of the -A option?
- What will be the output of the below command?
   Find example.txt in the repository!
  - > cat -A example.txt

- What other tools could have been used instead of pv?
- Show us your favorite ASCII art!

- How can you start a new screen in screen (nested session)?
- How can you detach from that inner screen?

