

Tech Lunch : Terminal

21/08/2019

Benjamin Digeon

Clever Age North America

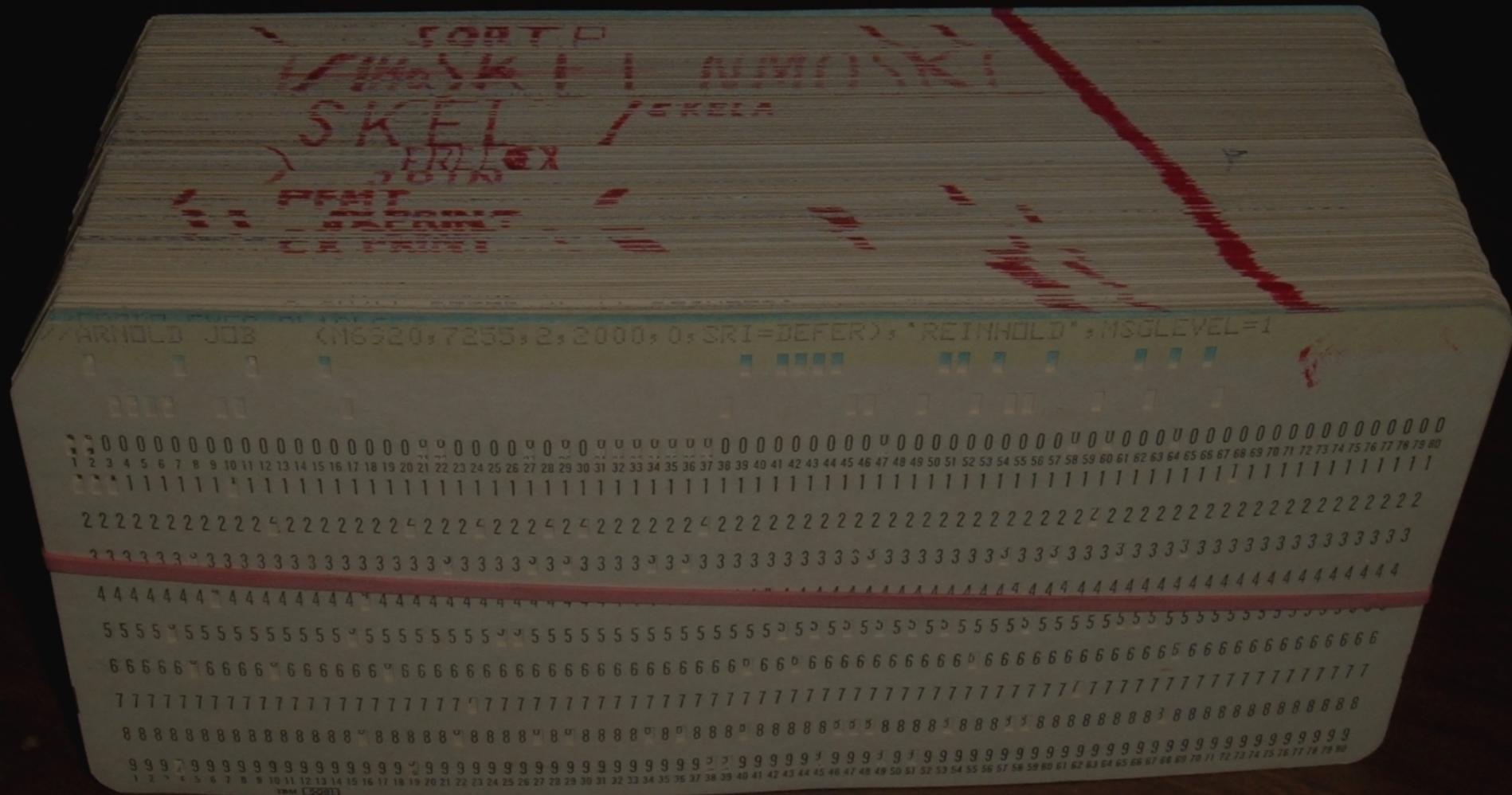
Human Computer Interaction

A little bit of history

Inputs / Outputs

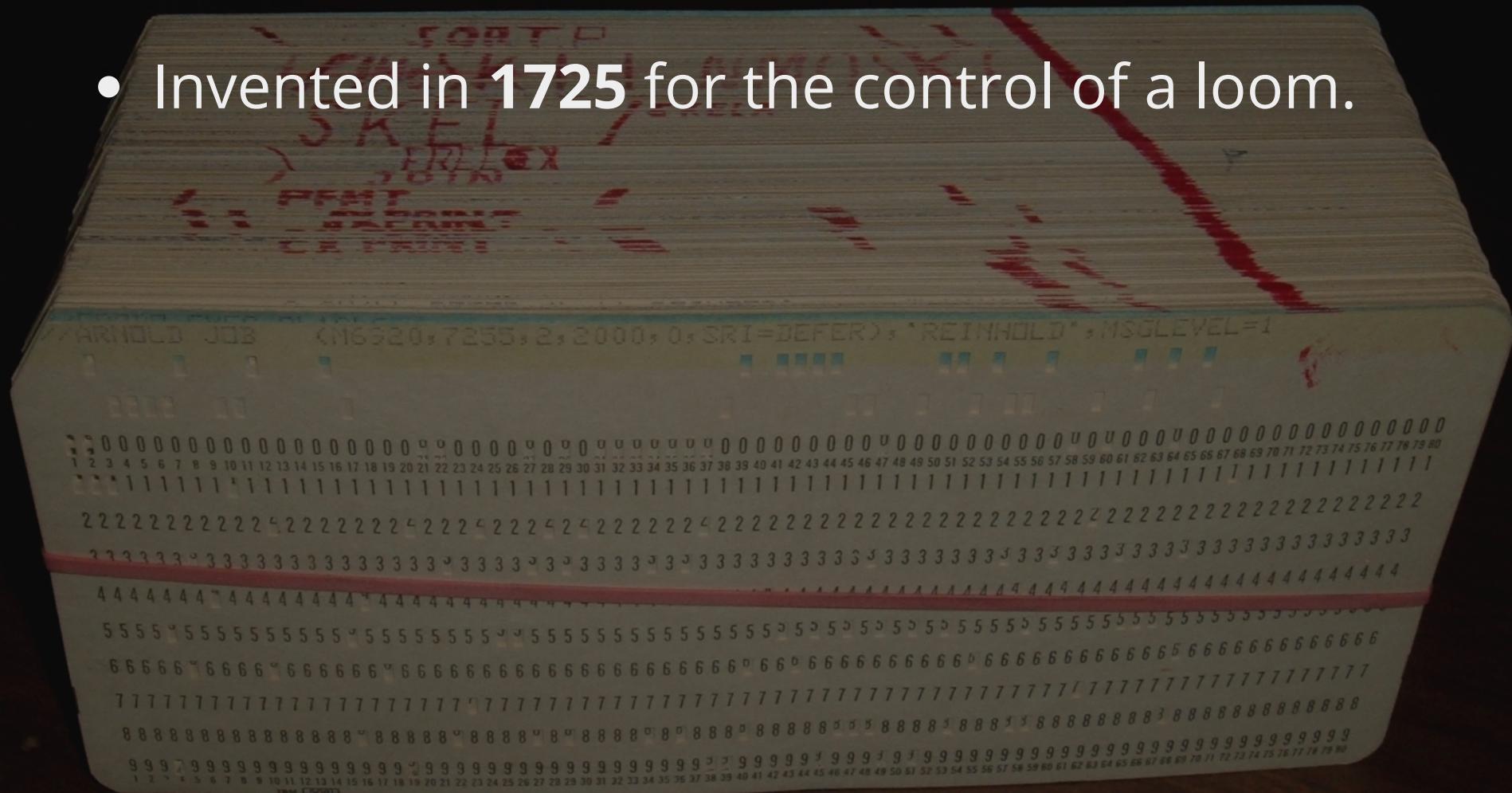
- How to pass data and/or commands to a machine ?
- How to receive information from a machine ?

Punched card



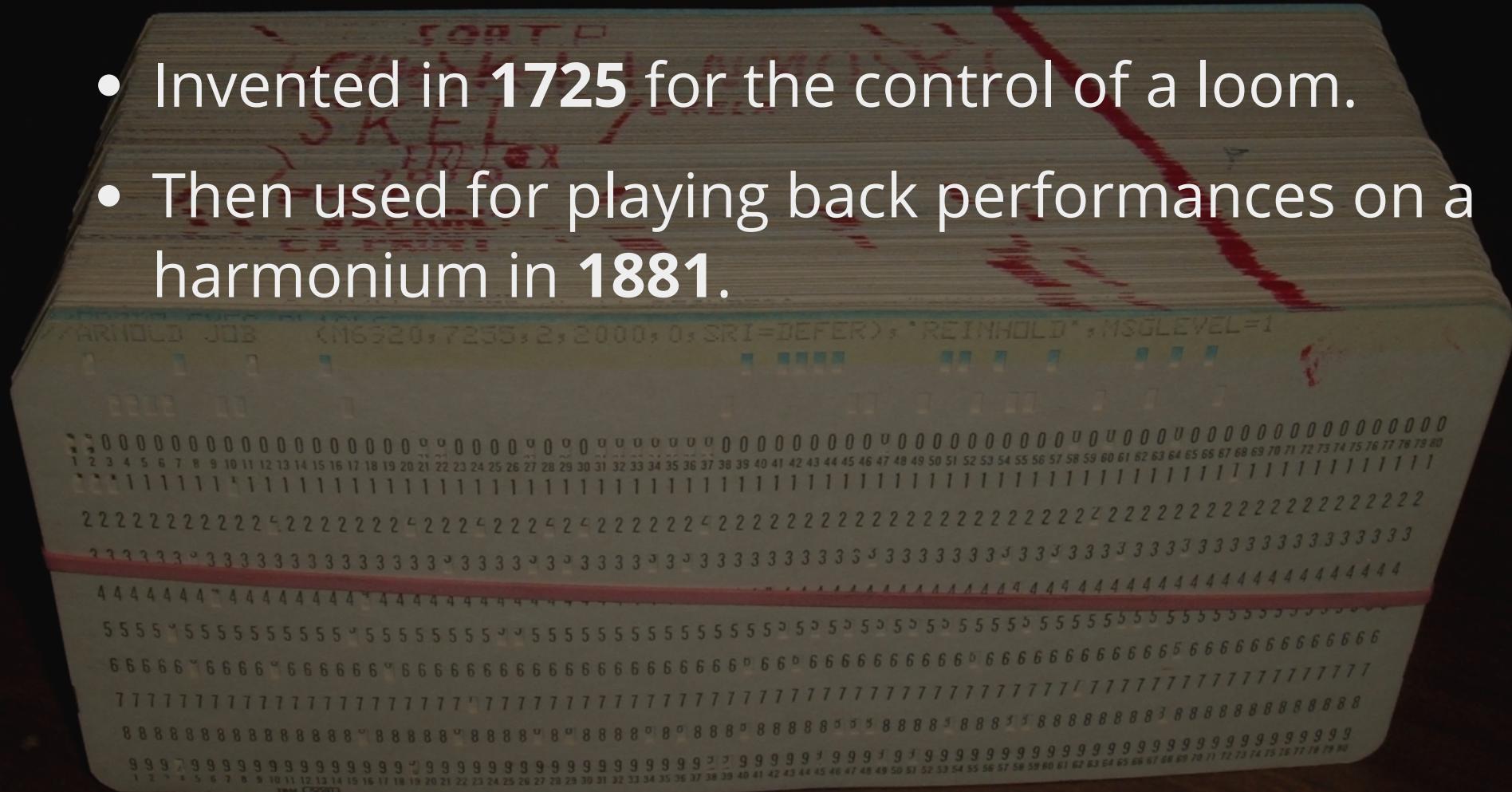
Punched card

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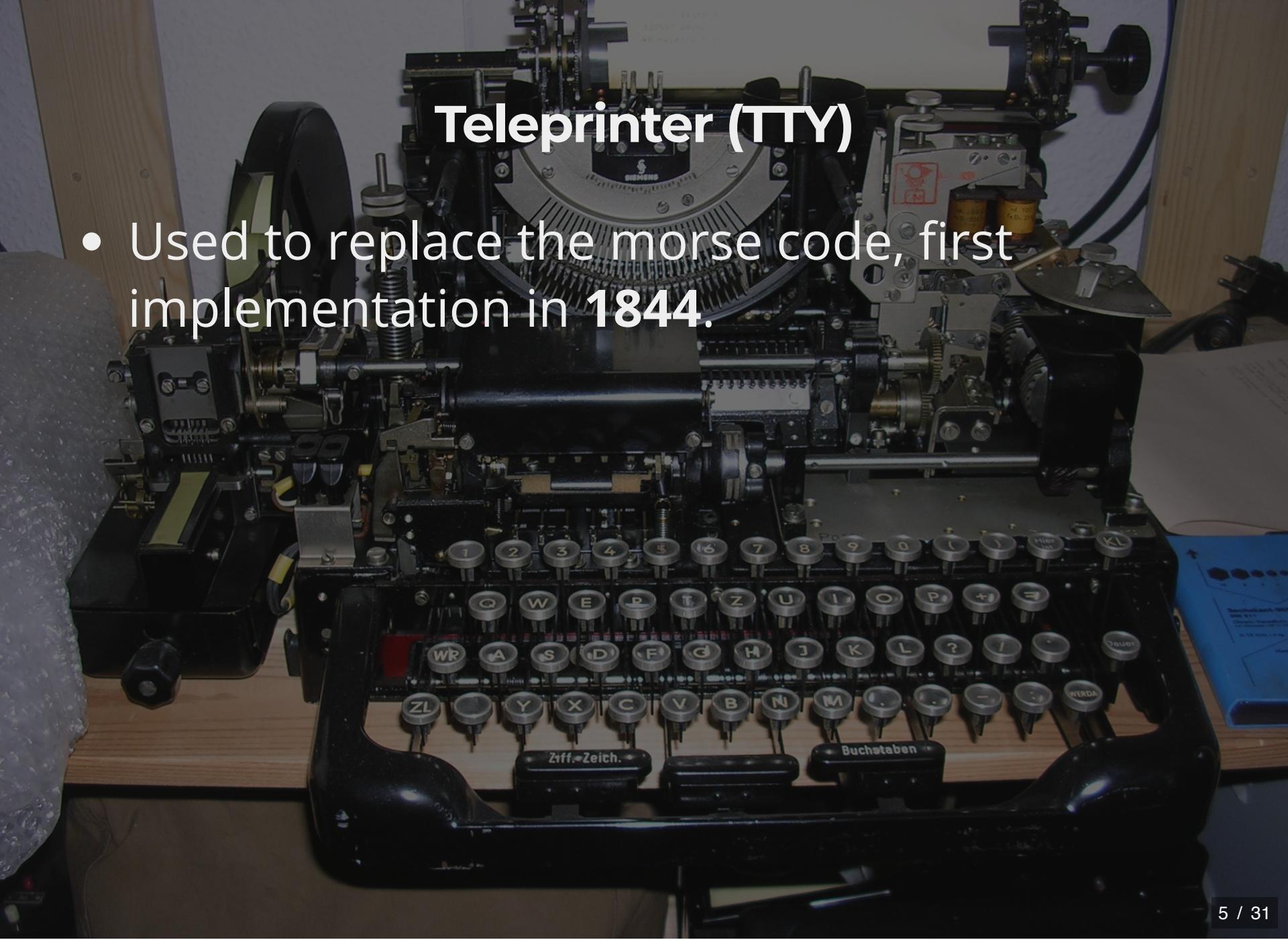
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- *Herman Hollerith* invented a electromechanical punched card tabulator used in the **1890** United States Census.
- His company was later amalgamated with others then renamed in **1924** the *International Business Machines Corporation*.

Teleprinter (TTY)



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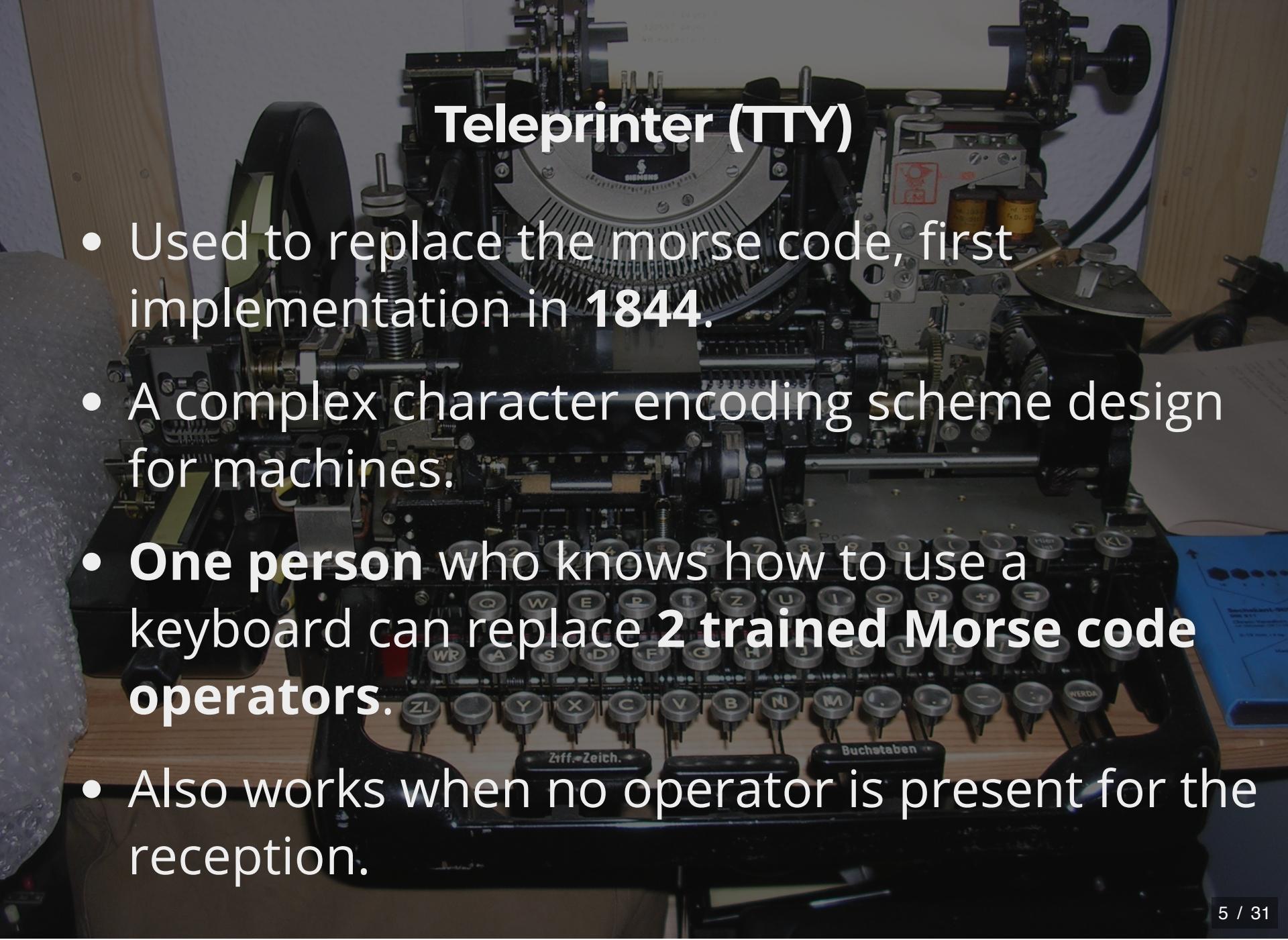


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Teleprinter (TTY)

- Used to replace the morse code, first implementation in **1844**.
- A complex character encoding scheme design for machines.
- **One person** who knows how to use a keyboard can replace **2 trained Morse code operators**.
- Also works when no operator is present for the reception.

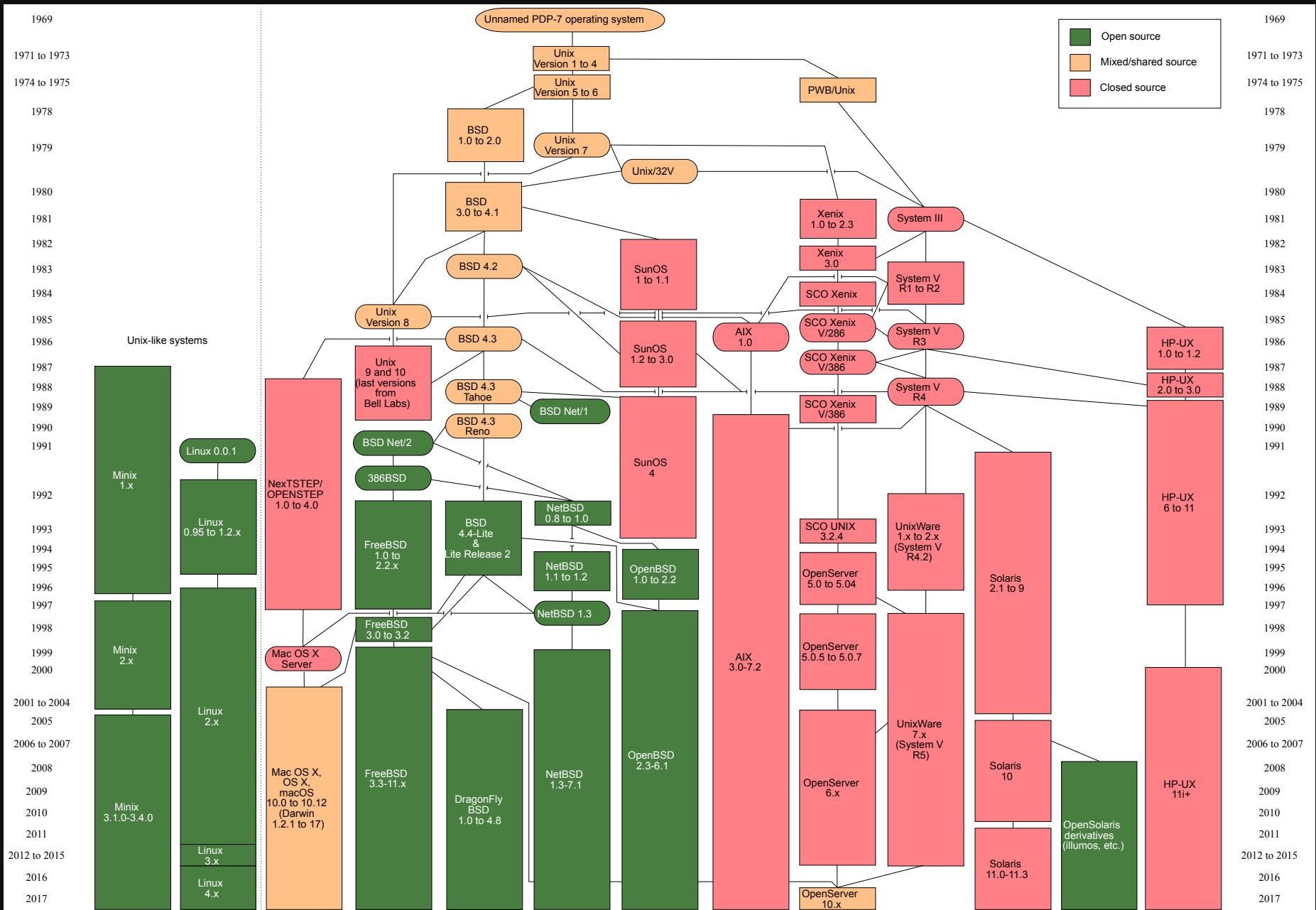
Keyboard, Monitor and Mouse

- When the CRT screens become available migration from TTY to screen + keyboard
- Then when graphical interface arrive add the mouse (apple)

UNIX

UNIX is very simple, it just needs a genius to understand its simplicity.

Dennis Ritchie



Architecture

- Kernel
- Development environment
- Commands
- Documentation
- And later a graphical interface

Everything is a file

- Documents
- Directories
- Hard-drives
- Modems
- Keyboards
- Printers
- Process
- Network communications

Processes

Each process have :

- PID
- User
- Command

Users

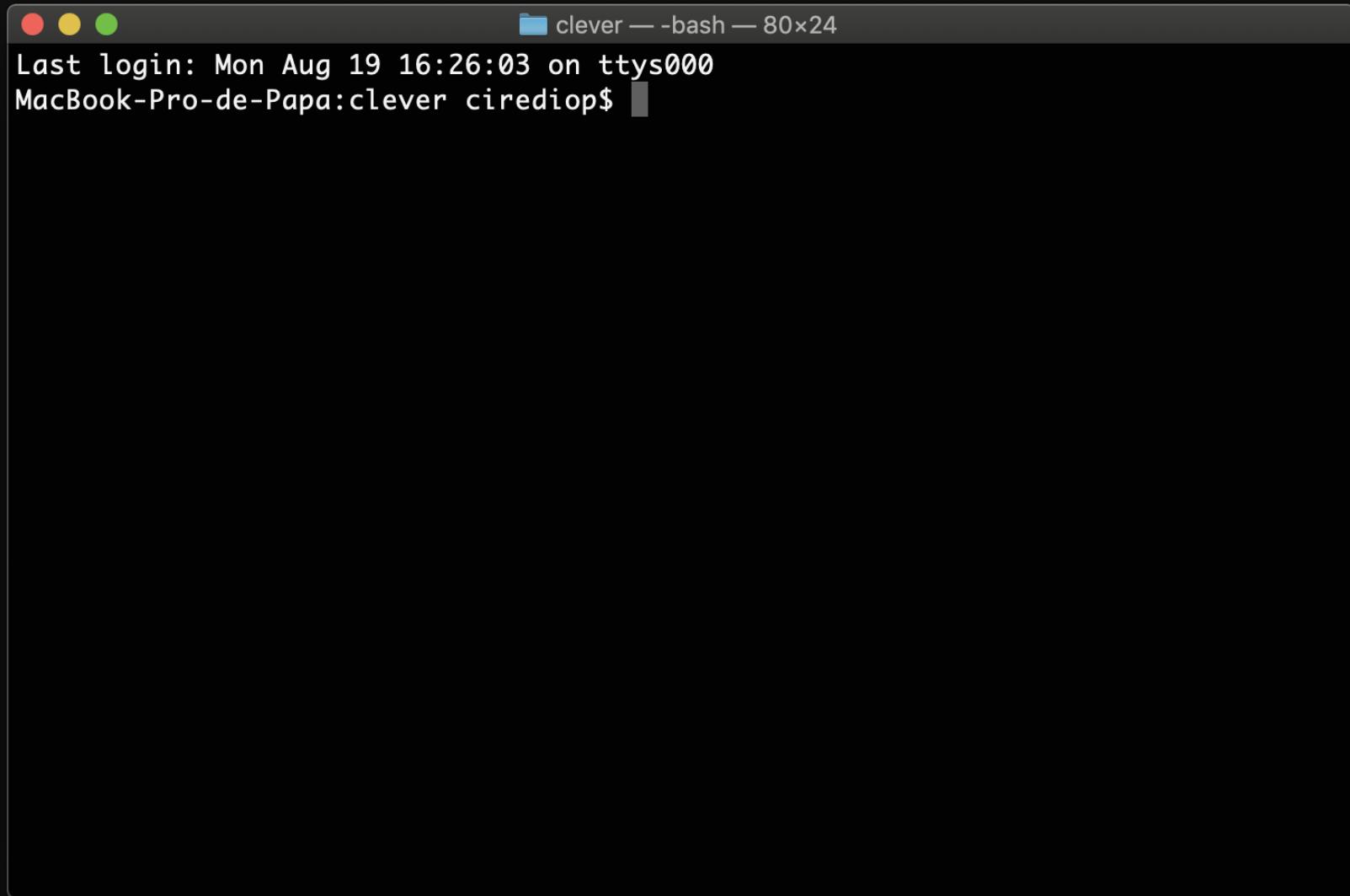
- Multi-user system
- A special user named root who is the administrator and have every rights

Permissions

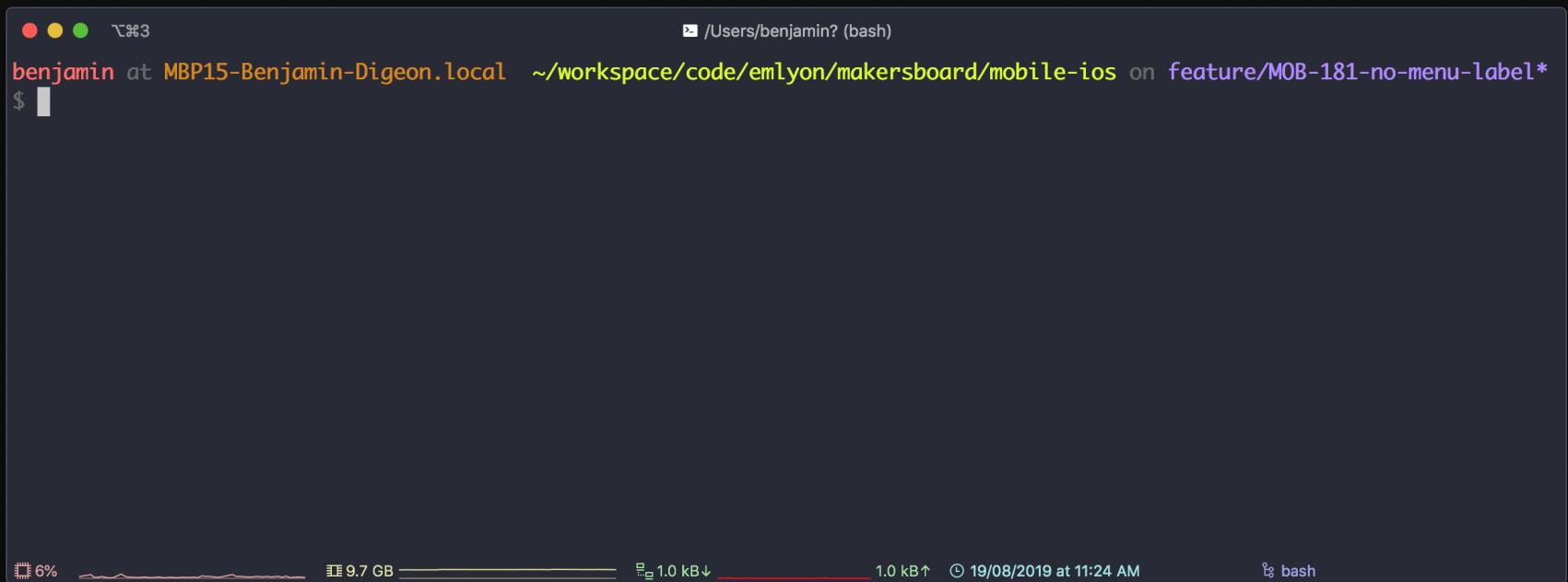
- Each "file" has an owner, a group and some basics ACL
- More details in examples

Terminal 101

MacOS default Terminal



iTerm



A screenshot of an iTerm window on a Mac OS X desktop. The window title bar shows the name of the tab: '/Users/benjamin? (bash)'. The main pane of the terminal is currently empty, with a cursor visible at the top left. The status bar at the bottom of the window displays several pieces of information: a battery icon followed by '6%', a signal strength icon followed by '9.7 GB', a download speed of '1.0 kB↓', an upload speed of '1.0 kB↑', the date and time '19/08/2019 at 11:24 AM', and a bash icon.

RTFM

man man

Special characters

```
. # the current working directory  
.. # the parent directory to working directory  
~ # your home directory  
/ # the root (top-level) directory.  
# This is also the separator for directories  
* # a wildcard meaning any string of characters  
? # a wildcard meaning any single character
```

Some commands

```
ls          # List files in this directory
pwd        # Where am i ?
cd          # Change directory
file filename.ext # What is this file ?
touch filename    # Create a file
mkdir directory   # Create a directory
clear        # Clear the screen (ctrl+l)
cp file1 file2    # Copy
mv file ~/tmp/      # Move
rm file          # Remove
rmdir directory   # Remove empty directory
```

Most commands support autocompletion with ↩

More commands

```
cat # Read file
more # Read file ++
less # Read file +++
tail # Read end lines
head # Read first lines
wc # Count
```

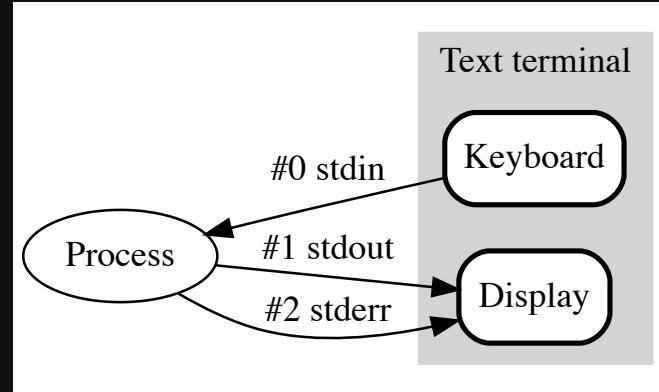
Permission

```
chmod # Change file modes or ACL  
chown # Change file owner and group
```

Interrupt keys

- **ctrl C** : interrupts whatever is currently running.
- **ctrl Z** : puts a foreground process into the background.
- **ctrl S** : suspends current terminal
- **ctrl Q** : resumes current terminal

Input and outputs



```
cat 'doesnotexist.txt' 2>/dev/null
```

Output codes

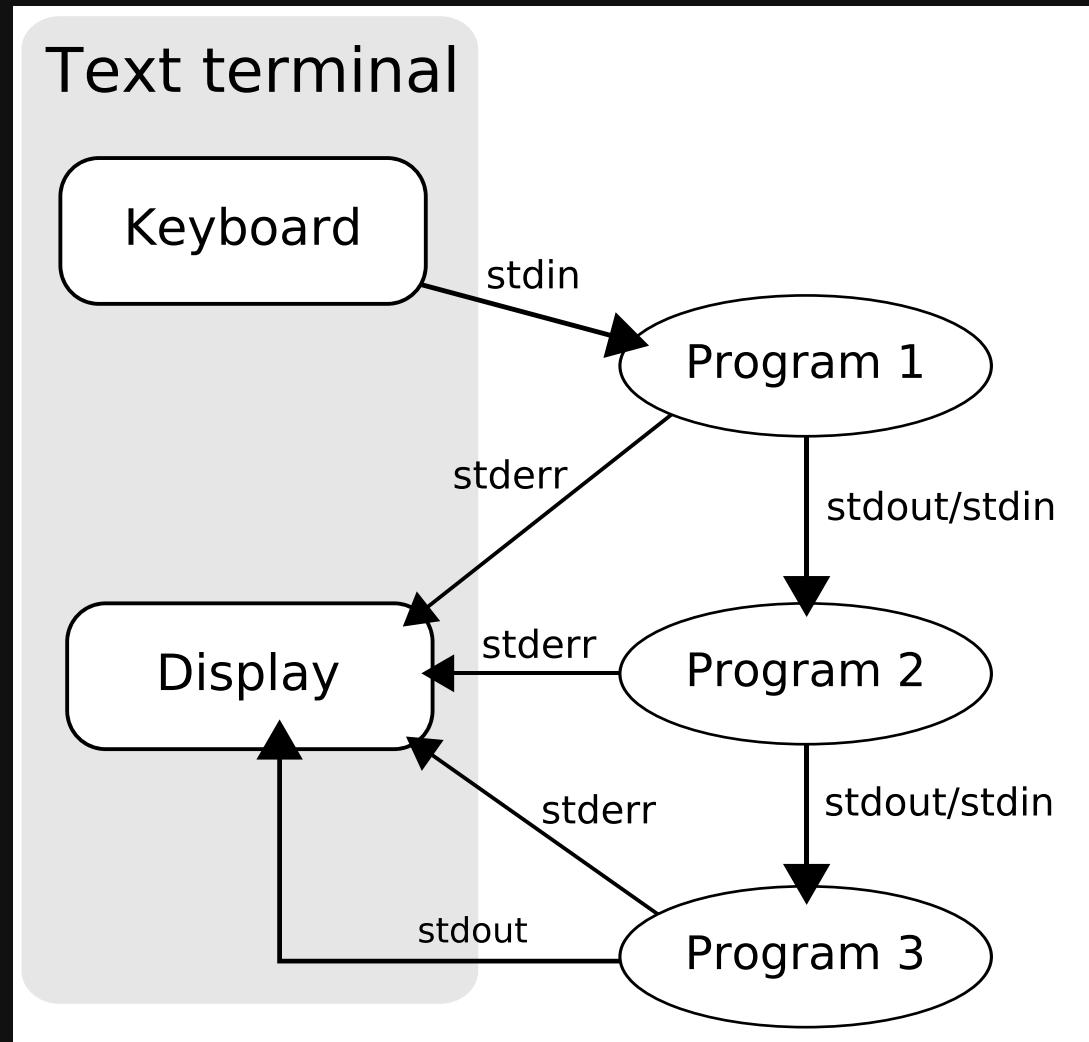
- A program has always an exit code
 - **0** if success
 - **1** to **255** anything else
- Read the manual for each program

```
cat file.txt
echo $?
cat doesnotexist.txt
echo $?
```

Redirecting

```
echo 'toto' > file.txt    # Redirects
echo 'toto' >> file.txt # Append
more < terminal.md       # Take input
command1 | command2      # Pipe stdout to stdin
```

Piping



Processes

```
ps    # Display processes status  
top   # See information about processes  
htop  # Top +++
```

Signals

```
kill -9 badProcessPID
```

- 3 QUIT (quit)
- 6 ABRT (abort)
- 9 KILL (non-catchable, non-ignorable kill)

Xargs

```
# When testing always use xargs -t  
  
echo 'one two three' | xargs mkdir  
find /tmp -mtime +14 | xargs rm
```

A photograph of a woman with long dark hair and glasses, wearing a dark top, standing in front of a window. In the background, a man is visible. The image is overlaid with large white text.

Thank you !

Questions ?