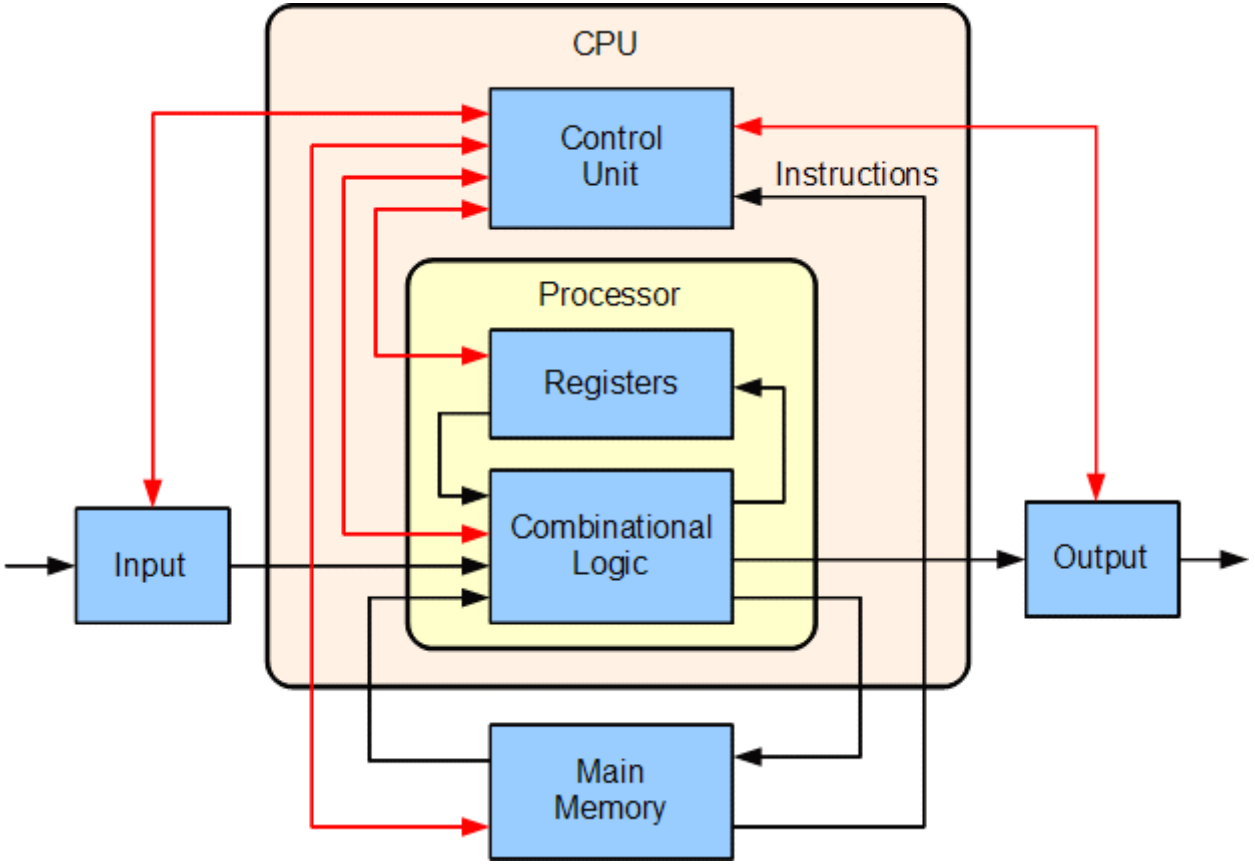
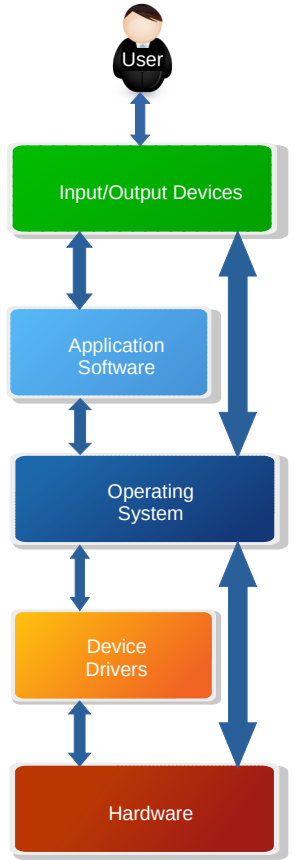
Getting Started With Programming

Computer

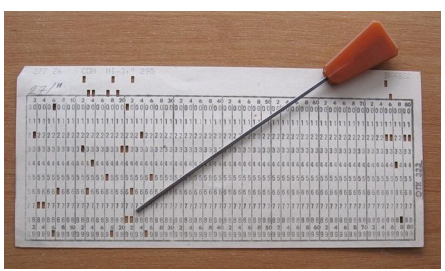

CPU
Control Unit
Instructions
Processor
Registers
Combinational Logic
Input
Output
Main Memory

How do we interact with Computer



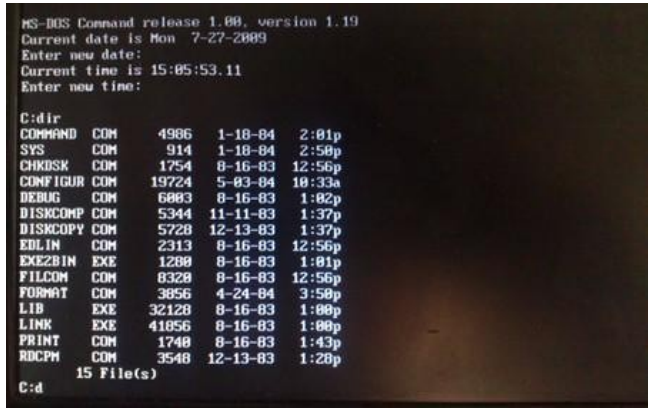
Operating System (History)

- The earliest computers were mainframes that lacked any form of operating system.
- Operating systems did not exist in their modern and more complex forms until the early 1960s.
- The first operating system used for real work was GM-NAA I/O, produced in 1956 by General Motors' Research division for its IBM 704.
- 1969: UNIX: laid the foundations of today's operating systems (Linux, Mac OS X, NeXTSTEP, OpenBSD etc.)



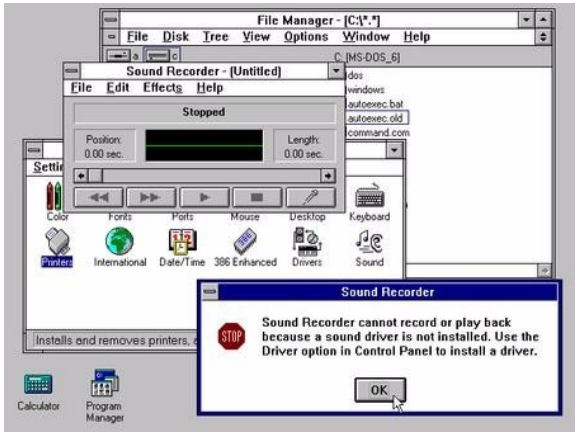
Operating System (History)

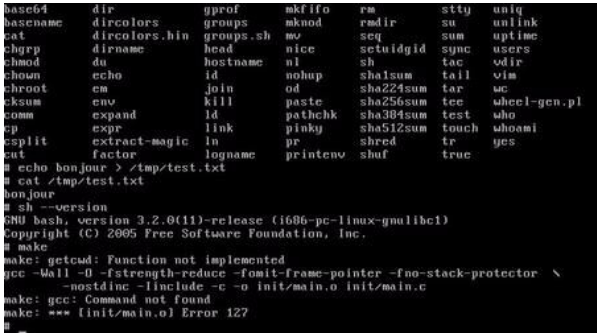
- 1973: Xerox Alto is the first computer designed from its inception to support an operating system based on a graphical user interface (GUI).
- 1977 – Apple II had Apple DOS
- 1981 – MS DOS
- 1984 – Mac OS
- 1985 – Windows 1.0



Operating System (History)

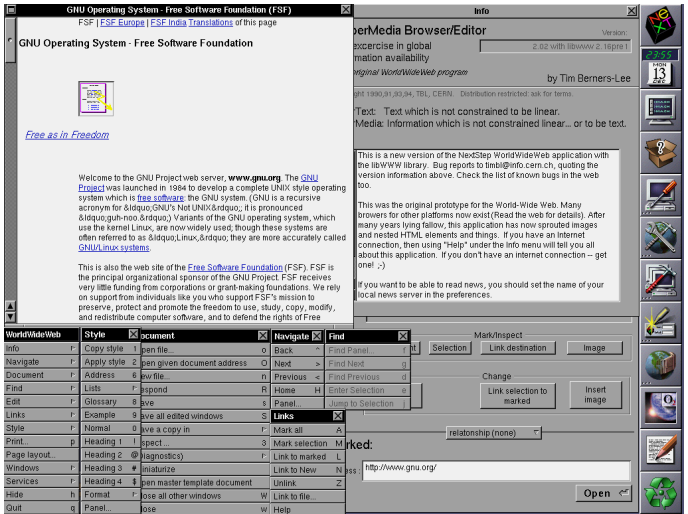
- The year 1991 brought the first Linux version 0.01
- 1992 – Windows 3.1
- 1995 – Windows 95





History of Web Browsers

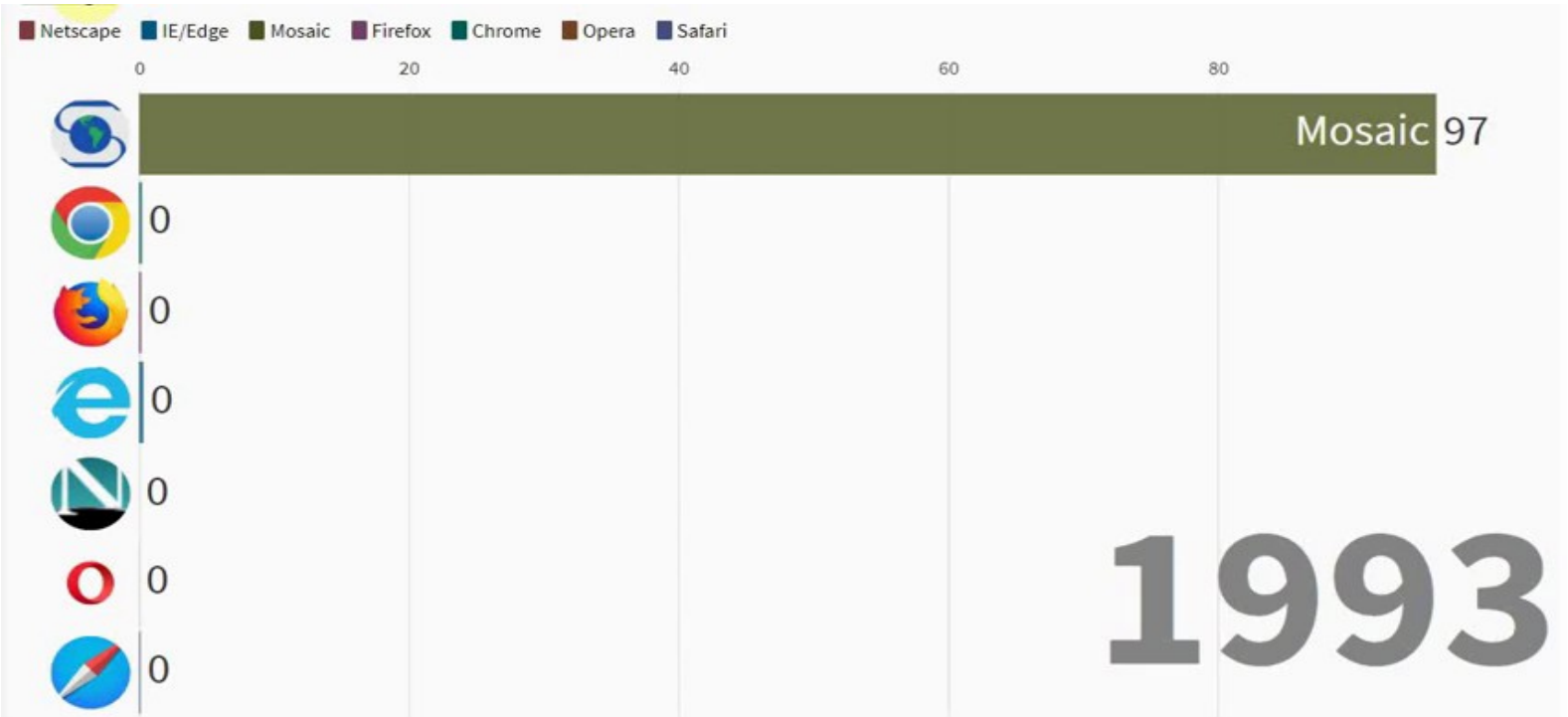
- In 1990 Tim Berners-Lee developed both the first web server, and the first web browser, called WorldWideWeb (later renamed Nexus).
- In 1992 the Lynx browser was announced.
- In September 1993 Marc Andreessen's developed Mosaic (later Netscape), credited with sparking the internet boom of the 1990s. It was the first web browser to display images inline with the document's text.



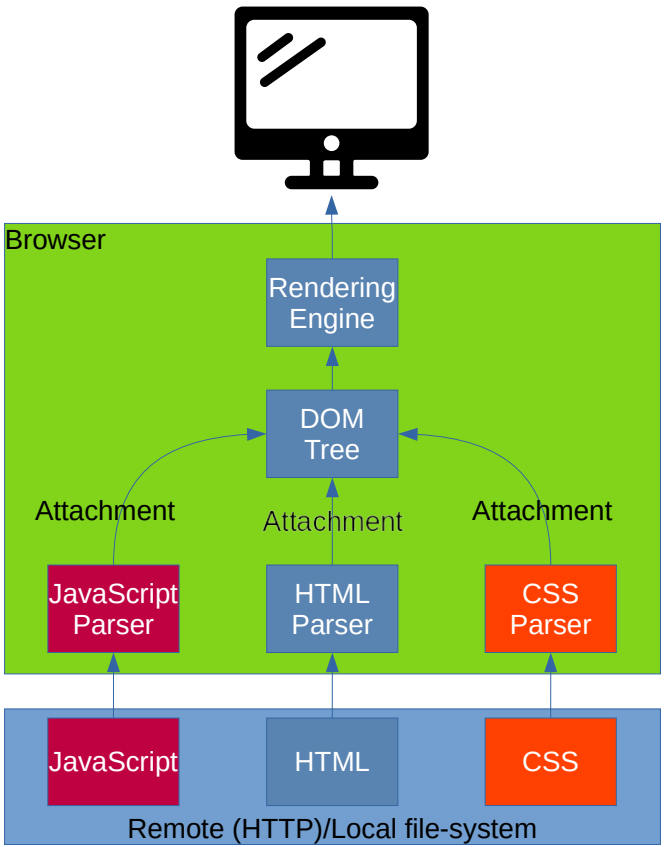
History of Web Browsers

- Marc Andreessen, the leader of the Mosaic team at NCSA, quit to form Netscape Communications Corporation. Netscape released its flagship Navigator product in October 1994.
- On 16 August 1995 Microsoft released version 1.0 of Internet Explorer.
- This began what is known as the "browser wars" in which Microsoft and Netscape competed for the Web browser market.
- Google released its Chrome Browser in 2008

Browser Market Share Timeline

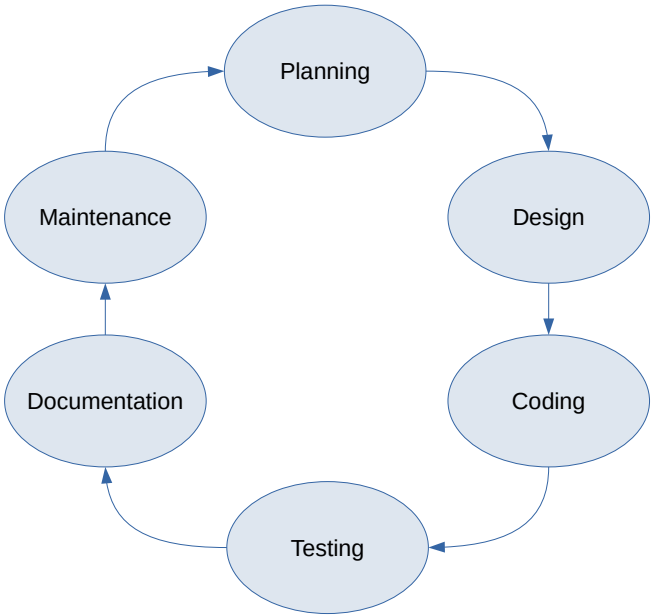


Architecture of a Browser



Computer Programming

- Computer programming is the process of designing and building an executable computer program to accomplish a specific computing result.
- Computer Programming usually includes the following activities:
  - Coding
  - Debugging
  - Testing
  - Documentatior
  - Maintenance



Programming Languages

- There are 3 types of programming languages:
  - Machine Language
  - Assembly Language
  - High Level Language

A function to calculate the nth Fibonacci number

```
8B542408 83FA0077 06B80000 0000C383
FA027706 B8010000 00C353BB 01000000
B9010000 008D0419 83FA0376 078BD989
C14AEBF1 5BC3
```

Machine Code

```
_fib:
        movl $1, %eax
.fib_loop:
        cmpl $1, %edi
        jbe .fib_done
        movl %eax, %ecx
        addl %ebx, %eax
        movl %ecx, %ebx
        subl $1, %edi
        jmp .fib_loop
.fib_done:
        ret
```

Assembly Language

```
unsigned fib(unsigned n) {
    if (!n)
        return 0;
    else if (n <= 2)
        return 1;
    else {
        unsigned a, c;
        for (a = c = 1; ; --n) {
            c += a;
            if (n <= 3) return c;
            a = c - a;
        }
    }
}
```

C Language

High Level Programming Languages

- High-level language provides abstraction from machine language. Rather than dealing with registers, memory addresses and call stacks, high-level languages deal with:
  - Variables
  - Arrays
  - Objects
  - Expressions
  - Functions
  - Loops

Things to do before next session

1) Install VS Code
2) Install Git
3) Setup a GitHub Account
4) Create a Repository in GitHub
5) Clone the created repository in a local directory
6) Install SourceTree (Optional. You figure out yourself what it is and if feel excited install it or just leave it)

Next Session

- Variables in JavaScript (var, let and const)
- Data Types
- Expressions
- Functions
- Arrays
- Loops