

History of C and UNIX

Not Really in Textbook

What is UNIX?

- **UNIX** is an operating system (OS)
- A lot of features common in OSes today were pioneered or popularized by UNIX such as multiple user capabilities, hierarchical file systems, and networking
- Reputation for being stable and secure
- Great for programming!

Multics

- In the mid-1960s, MIT, AT&T Bell Labs, and GE were working together on an operating system called **Multics** (**M**ultiplexed **I**nformation and **C**omputing **S**ervice)
- Intended for a mainframe computer
- Idea to allow multiple users to share the computer

UNIX

- Around 1969, AT&T left the group and began making their own OS, using some ideas from Multics
- **Ken Thompson** was one of the primary programmers
 - **Brian Kernighan** wrote a number of UNIX programs
- Result was first called **UNICS** (**Uniplexed Information and Computing Service**)
- Later renamed to **UNIX** and **Unix**

- Several versions and iterations followed
- In 1973, AT&T licensed Version 5 UNIX to educational institutions
- In 1975, Version 6 UNIX was licensed to companies
- Early releases provided the source code of UNIX
- Subsequently, modifications were often made by licensees

BSD



https://en.wikipedia.org/wiki/File:Bsd_daemon.jpg

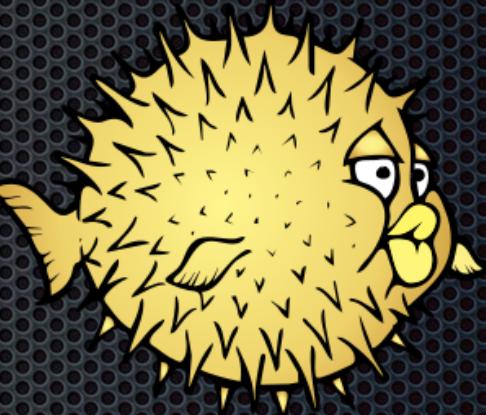
- One of the early recipients of UNIX was University of California, Berkeley
- Various features were added at Berkeley, notably networking capabilities, Berkeley sockets
- This modified version of UNIX was distributed by Berkeley and known as **BSD (Berkeley Software Distribution)**
- Many open source versions of UNIX derive from BSD



FreeBSD

https://en.wikipedia.org/wiki/File:Freebsd_logo.svg

- Some popular open source UNIX versions are:
 - FreeBSD – popular version of UNIX
 - OpenBSD – emphasis on security
 - NetBSD – emphasis on portability



OpenBSD

https://en.wikipedia.org/wiki/File:OpenBSD_Logo_-_Cartoon_Puffy_with_textual_logo_below.svg



<https://en.wikipedia.org/wiki/File:NetBSD.svg>

System V

- AT&T Bell Labs continued developing and distributing UNIX
- AT&T had been having some legal problems that largely prevented them from commercializing UNIX as a product
- Around 1983, AT&T now found itself in a position to legally commercialize UNIX
- UNIX System V Release 1 was soon released
- Many commercial flavors of UNIX derive from System V

- Some commercial versions of UNIX are:
 - Solaris – Sun Microsystems, now open source
 - AIX – version from IBM
 - IRIX – version from Silicon Graphics, Inc. (SGI)
 - macOS – version by Apple, derives BSD, parts open source

- Trivia..
- IRIX system that appeared in the film Jurassic Park
- Futuristic 3D program was called fsn
 - <https://en.wikipedia.org/wiki/Fsn>
- SGI also developed popular 3D graphics API OpenGL

Linux



[https://en.wikipedia.org/wiki/File:Linus_Torvalds_\(cropped\).jpg](https://en.wikipedia.org/wiki/File:Linus_Torvalds_(cropped).jpg)

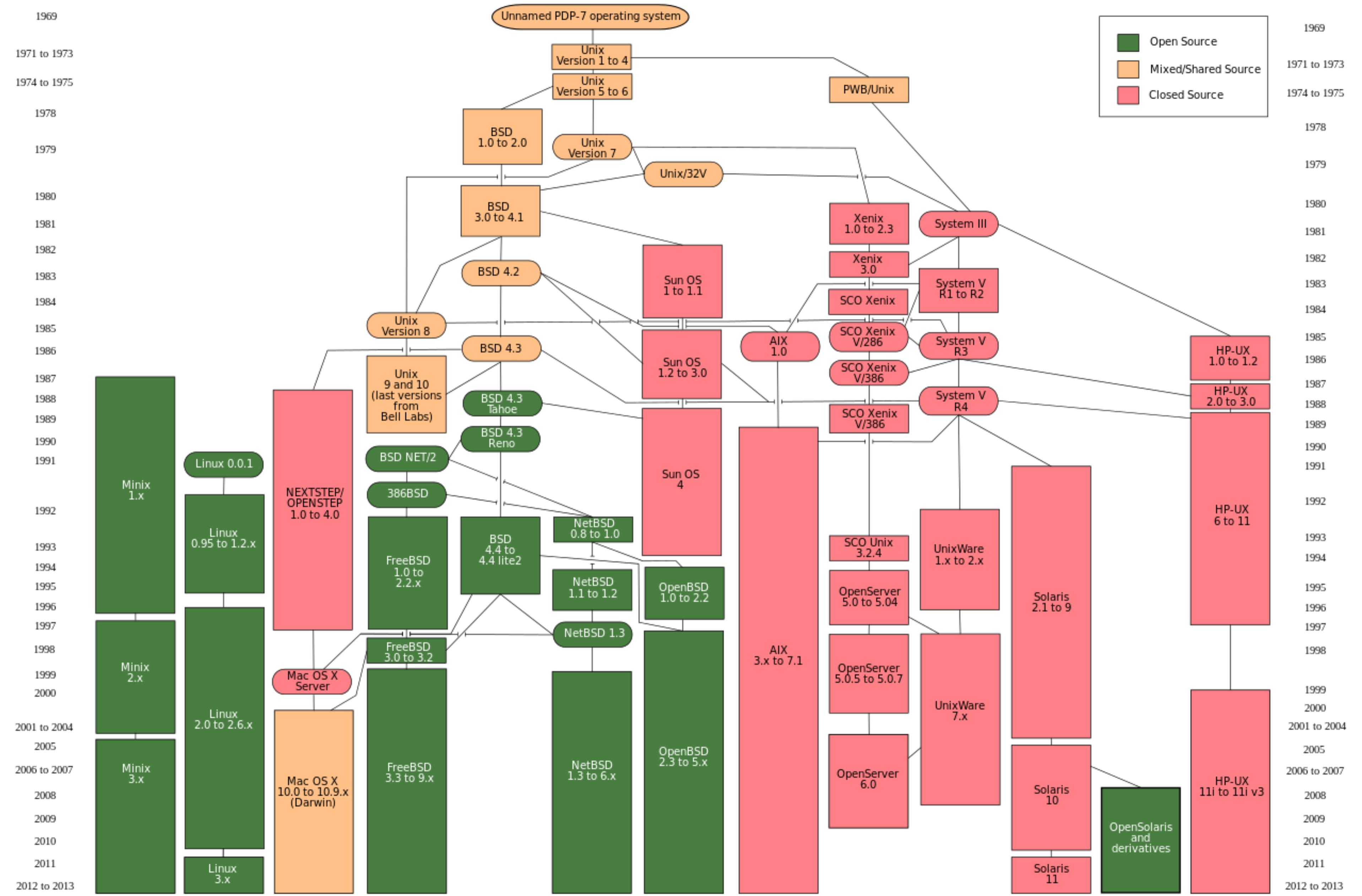


<https://en.wikipedia.org/wiki/File:Tux.svg>

- **Linus Torvalds** wanted to create an operating system for personal computers
- In 1991, he released the Linux kernel
- Much supporting software was made by the GNU Project
- Together, the two comprised a UNIX-like operating system for personal computers

- Development of the Linux kernel and accompanying open source software continues to this day
- Many distributions of Linux have been created by various organizations and companies
- Some are for specialized purposes others are simply because someone wanted to make their own

- Some popular distributions are:
 - Slackware – older distribution still around
 - Ubuntu – newer, user friendly
 - Debian – very free software
 - Fedora – from Red Hat, pretty mainstream
 - Gentoo – built from source, very customizable
 - And many, many more



GNU Project

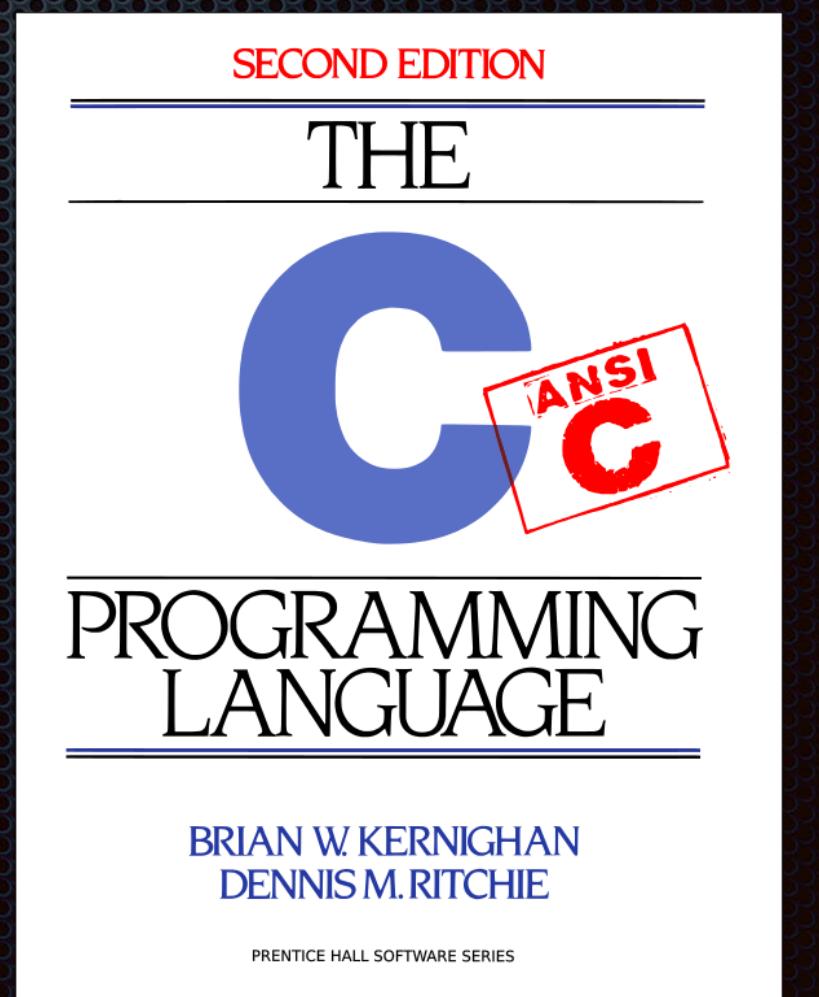


https://en.wikipedia.org/wiki/File:Heckert_GNU_white.svg

- In 1983, a man named **Richard Stallman** started the **GNU Project**
- One of the goals of the GNU Project was to produce free software for UNIX and UNIX-like operating systems
- Many of the open source programs that run on Linux and UNIX today are from the GNU Project

What is C?

- C is a programming language developed by **Dennis Ritchie** at AT&T Bell Labs in late 60s / early 70s
 - Previous language named B for Bell
- Eventually, UNIX was written mostly in C
 - A lot of operating systems written in C



https://en.wikipedia.org/wiki/File:The_C_Programming_Language_cover.svg

- General-purpose language
- High-level language, but at lower end of high-level
- Efficient!
 - Used a lot for embedded software
- Still widely used
 - <http://www.tiobe.com/index.php/content/paperinfo/tpci/index.html>

C++, Objective-C, and C#

- C itself is not an object-oriented language
- C++ (1983) and Objective-C (1984) are both languages that add object-oriented capabilities to the C language
- Despite the name, C# (2000) probably has more in common with Java than C