CSCM603127 System Programming
Week 1 – Logbook
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System Programming and Application Programming

- System programming is how to make a program that can connect the hardware part of a computer with the end-user.
- Application programming is how to make a program that can connect a feature that directly interacts with the end-user.

System Programing Languages

- Examples: Assembly, C, Ruby, Python, etc.
- Best Scripting Language based on Readers' Choice Awards 2014: Python 37.1%

Scripting and Programming Language

- Scripting: uses an interpreter to be translated to machine language
- Programming language: uses a compiler to be translated to machine language

Systems Programming Course Highlights

- Programming assignments
- Environments: Linux Debian 7.0, Posix Threads, ARM
- Unix: Shells, gcc/g++, make, script
- Languages: Shell, C, C++, Python, PHP
- IDE: Nano/pico, Vi/Vim, Emacs
- Software Engineering: Git, gitlab.cs.ui.ac.id

History of Unix and C

- 1969: First Unix
- 1970: Unix has rewritten in assembly for DEC PDP-11
- 1973: Kernel has rewritten in C
- 1984: Turing Award Lecture

Berkeley Software Division (BSD)

- 1975: Thompson at UC Berkeley
- 1983: BSD 4.2 - FUll TCP/IP & sockets API

Unix after Unix 7th Edition

- 1979: BSD continued
- 1988: POSIX standard, Minix

GNU

- The recursive acronym "GNU's Not UNIX"
- 1983: Goal a free Unix

Linux

- 1991: Linus Torvalds

Kernel

- The program that controls other programs in a computer

- User mode: applications run on user mode
- Kernel mode: hardware on an operating system run on kernel mode

Kernel Tasks

- Process scheduling
- Memory management
- File system
- Access to devices
- Networking
- System call API

File Types

- Filenames
- Regular files
- Special files
    - Directory
        - . (current working directory)
        - .. (parent working directory)

Pathnames

- Unix basic commands with hierarchy
    - Current working directory (.)
    - Pwd
- A relative path is a path to a certain location of a file **starting from the current working directory**.
- An absolute path is a path to a certain location of a file, **starting from the root directory**, regardless of the current working directory