Chapter 8: The UNIX System Interface

- The UNIX operating system provides its services through a set of system calls.
    - Functions in the OS that may be called by user programs.

8.1 File Descriptors

- In UNIX operating systems all input and output is done by reading or writing files.
    - Everything is treated as a file in the system.
        - Peripheral devices, keyboard and screen, etc.
- Before you can read or write a file you have to open it.
    - The system checks your right to do so.
        - If you have the right to do so the file descriptor is returned.
        - Whenever input our output is to be done to a file the file descriptor is used.

8.2 Low Level I/O -- Read and Write

- Input and output uses the read and write system calls.
    - accessed through C programs using the read and write functions.
    - For both functions the first arg is a file descriptor.
    - Each call returns the number of bytes transfered.
    - Return 0 means EOF and -1 indicates and error.
- Any number of bytes can be read or written in one call.
    - Larger block sizes are more efficient.

8.3 Open, Creat, Close, Unlink

- Other than stdin, stdout, stderr files must be explicitly opened to read or write to them.
- open and creat are system calls to open files.
    - it is an error to try to open a file that doesn't exist.
        - in that case creat creates the file with specified permissions.
        - There are nine bits of permission info for a file.
            - control read, write, and execute actions.
    - If the file already exists creat will truncate it.

Random Access -- Lseek

- Input and output are normally sequential.
    - each read/write takes place at a position in the file right after the previous.
- It is possible to make a file be written in an arbitrary order.
- `lseek` provides a way to move around a file without read/write.