Input/Output

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OS Responsibilities

- OS controls all computers I/O devices: issuing commands to them, catching interrupts, and handles errors
- OS provides simple, easy to use interface between devices and the rest of the system
  - interface should be device independent as far as possible
- I/O code represents significant fraction of total OS

Principles

- I/O devices can be roughly categorised as block devices and character devices
- the boundary isn't always well defined, but the categorisation is usually decided based on typical use: a tape could be randomly-accessed as a block device with very slow delays in between, but this is not how they are normally used

Block Devices

- **block device**: stores information in fixed-size, addressable blocks
- all transfers are in units of one or more entire, consecutive blocks
- essential property: each block can be read/written to independently of all others
- e.g. Hard disk, Blu-ray disc, USB stick

Character Devices

- **character device**: delivers/accepts a stream of characters without any block structure
- not addressable

- no seek operation
- e.g. computer mouse, printer, network interface, most other non-disk devices