

Assignment3 of EI209

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7.8 Advantages:

- (1) Since there is a single address space for memory locations and I/O devices, the access to peripherals could be more flexible. We can design more types of instructions of I/O than isolated I/O.
- (2) There's no need to design additional component to distinguish I/O access instructions from memory access instructions.

Disadvantages:

- (1) The number of memory location could be smaller than that of isolated I/O.
- (2) The addressing of I/O devices is more complex than that of isolated I/O.

7.9 a. The times equal to

$$(8 \times 60 \times 60)\text{s} \div 0.1\text{s} = 288000$$

b. The fraction equals to

$$1 - \frac{60}{288000} = 99.98\%$$

7.10 a. Since it interrupts 8000 times per second, the fraction of the processor time equals to

$$\frac{100\mu\text{s}}{\frac{1}{8000}\text{s}} = 0.8$$

- b. Since the time interval of interrupts is $16 \div 8000 = 2 \times 10^{-3}\text{s}$, and the transfer time of 16-byte of the processor is $100 + 8 \times (16 - 1) = 220\mu\text{s}$, the fraction of the processor time equals to

$$\frac{220\mu\text{s}}{2 \times 10^{-3}\text{s}} = 0.11$$