

# 作业九

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Practice Exercise: 9.6, 9.7, 9.9, 9.10

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**9.6 Given six memory partitions of 300 KB, 600 KB, 350 KB, 200 KB, 750 KB, and 125 KB (in order), how would the first-fit, best-fit, and worst-fit algorithms place processes of size 115 KB, 500 KB, 358 KB, 200 KB, and 375 KB (in order)?**

- first-fit:
  - 115KB -> 300KB, Memory: [185KB, 600KB, 350KB, 200KB, 750KB, 125KB]
  - 500KB -> 600KB, Memory: [185KB, 100KB, 350KB, 200KB, 750KB, 125KB]
  - 358KB -> 750KB, Memory: [185KB, 100KB, 350KB, 200KB, 392KB, 125KB]
  - 200KB -> 350KB, Memory: [185KB, 100KB, 150KB, 200KB, 392KB, 125KB]
  - 375KB -> 392KB, Memory: [185KB, 100KB, 150KB, 200KB, 17KB, 125KB]
- best-fit:
  - 115KB -> 125KB, Memory: [300KB, 600KB, 350KB, 200KB, 750KB, 10KB]
  - 500KB -> 600KB, Memory: [300KB, 100KB, 350KB, 200KB, 750KB, 10KB]
  - 358KB -> 750KB, Memory: [300KB, 100KB, 350KB, 200KB, 392KB, 10KB]
  - 200KB -> 200KB, Memory: [300KB, 100KB, 350KB, 0KB, 392KB, 10KB]
  - 375KB -> 392KB, Memory: [300KB, 100KB, 350KB, 0KB, 17KB, 10KB]
- worst-fit:
  - 115KB -> 750KB, Memory: [300KB, 600KB, 350KB, 200KB, 635KB, 125KB]
  - 500KB -> 635KB, Memory: [300KB, 600KB, 350KB, 200KB, 135KB, 125KB]
  - 358KB -> 600KB, Memory: [300KB, 242KB, 350KB, 200KB, 135KB, 125KB]
  - 200KB -> 350KB, Memory: [300KB, 242KB, 150KB, 200KB, 135KB, 125KB]
  - 375KB can't be allocated right now.

**9.7 Assuming a 1-KB page size, what are the page numbers and offsets for the following address references (provided as decimal numbers):**

- a. 3085
- b. 42095
- c. 215201
- d. 650000
- e. 2000001

- a. page =  $\text{int} \frac{3085}{1024} = 3$ , offset =  $3085 \bmod 1024 = 13$
- b. page = 41, offset = 111
- c. page = 210, offset = 161
- d. page = 634, offset = 784
- e. page = 1953, offset = 129

**9.9 Consider a logical address space of 256 pages with a 4-KB page size, mapped onto a physical memory of 64 frames.**

**a. How many bits are required in the logical address?**

**b. How many bits are required in the physical address?**

a. 20bits are required.  $\log(4KB) = \log(2^{12}) = 12$ ,  $\log(256) = 8$ ,  $8+12=20$ .

b. 18bits are required.  $\log(4KB) = 12$ ,  $\log(64) = 6$ ,  $12+6=18$ .

**9.10 Consider a computer system with a 32-bit logical address and 4-KB page size. The system supports up to 512 MB of physical memory. How many entries are there in each of the following?**

**a. A conventional, single-level page table**

**b. An inverted page table**

a.  $2^{20}$  entries ,  $32 - \log(4KB) = 20$

b. 128K entries,  $512MB/4KB = 128K$