

# Assignment 9

516030910259 **Xinpeng Liu**

**9.4** The higher 20 bits of the address, which in this case is  $11123_{16}$  will be transferred into a corresponding 6-bit physical page number by MMU. For example the corresponding 6-bit page number is  $0F_{16}$ . The lower 12 bits will be saved as page offset. Then these two parts will be spliced into an 18-bit physical address  $0F456_{16}$ .

**9.8** . Consider the sequence '1,2,3,3,4,5,1' with a memory that can hold 4 pages. When fetching page 5, MFU will replace page 3, and LRU will replace page 1. Then for the next access, LRU will generate a page fault while MFU won't. For the opposite, consider the sequence '1,2,3,3,4,5,3' for the same memory. When fetching page 5, MFU replaces page 3, and LRU replaces page 1. Then for the next access, MFU will generate a page fault while LRU won't.

## 9.13

- a. (a) 0
  - (b) When a new page is associated with the frame.
  - (c) When a page that associated with the frame is not needed.
  - (d) Choose the page with the least counter. Use FIFO if there are counters with the same value.
- b. 14 page faults.
- c. 11 page faults.

**9.14**  $0.8*1+0.18*2+0.02*20002=401.2\mu s$