A system implements paging using a page size of 4096 (2^12) bytes.

The diagram below shows the current state of the TLB, CoreMap, Swap Space and page tables for only two of several executing programs (Program A and Program B).

Note that VPN refers to the virtual page number and PFN refers to the corresponding physical frame number. M, U, V, and D are the modified, use, valid and dirty bits, respectively.

The SW entry (right most column in each page table) is used to denote the sector on the swap disk used to store the page.

A value of -1 in the SW column indicates that the page is not stored on the swap disk.

An X on the swap disk indicates that the sector is used.

Assume that:
o the next three potential victims chosen by the page
  replacement algorithm are (4, 0, 3);
o the next three potential victims chosen by the TLB
  replacement algorithm are (1, 2, 0);
o the next three potential free sectors used
  on the swap disk are (2, 3, 5).

List all steps performed by the operating system and MMU when executing the following sequence of memory references. Present the steps as a list of entries and distinguish those performed by the operating system (denote these with ``OS'') from those performed by the hardware (denote these with ``HW''). Be sure to include the resulting physical address if a valid translation is made.

Process A does a load from address 0x00003C9A.
Process A does a store to address 0x00002F08.