Project Specifications

- Physical memory is an integer array PM[524288]
- The disk (when implementing demand paging) is an integer array D[1024][512]
- All VAs and PAs are integers
- The size of s, p, and w is 9 bits each.
- The VM manager initializes the PM from an input file consisting of 2 lines.
    - Line 1 contains triples of integers, which define the contents of the ST
    - Line 2 contains triples of integers, which define the contents of the PTs
    - The initialization file is syntactically correct in that:
        - Line 1 correctly specifies 1 or more segment table entries
        - Line 2 correctly specifies 0 or more entries in PTs for the segments specified on line 1
- The VM manager then reads VAs from another input file, attempts to translate each into a PA, and write the results into an output file
- The basic version of the VM manager does not support demand paging and is worth 60% of the credit for the project
- The extended version of the VM manager must support demand paging and is worth 100% of the credit for the project
- For demand paging, the PM will always have a sufficient number of free frames available so that no page replacement algorithm is needed.

Simple test cases

Without demand paging:

- The initialization file contains the 2 lines:

  6 3000 4
  6 5 9

- The input file contains:

  1575424 1575863 1575864

- The output file should contain:

  4608 5047 -1

With demand paging:

- The initialization file contains the 2 lines:

  8 4000 3 9 5000 -7
  8 0 10 8 1 -20 9 0 13 9 1 -25

- That means, frames 0, 1, 3, 10, 13 are occupied. The following VA translations use the free frames 2, 4, 5 when a page fault occurs.

- The input file contains:

  2097162 2097674 2359306 2359818

- The output file should contain:

  5130 1034 6666 2570