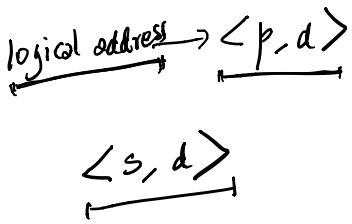
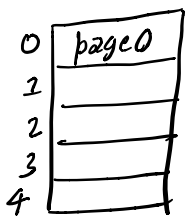
SEGMENTATION TECHNIQUE FOR MEMORY MANAGEMENT

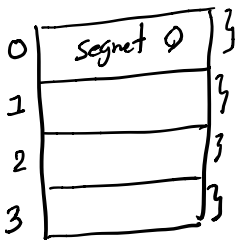
- Users prefer to view memory of a process as a collection of variable-sized segments with no necessary ordering among them
- Users rarely view a program as a linear array of bytes
- A C program may consists of following segments:
  - Code segment
    - Main function code
    - Sqrt function code
  - Data segment - Global variables
  - Heap segment - dynamic memory
  - Stack segment - local variables and functions
  - Segments for the C library - glibc

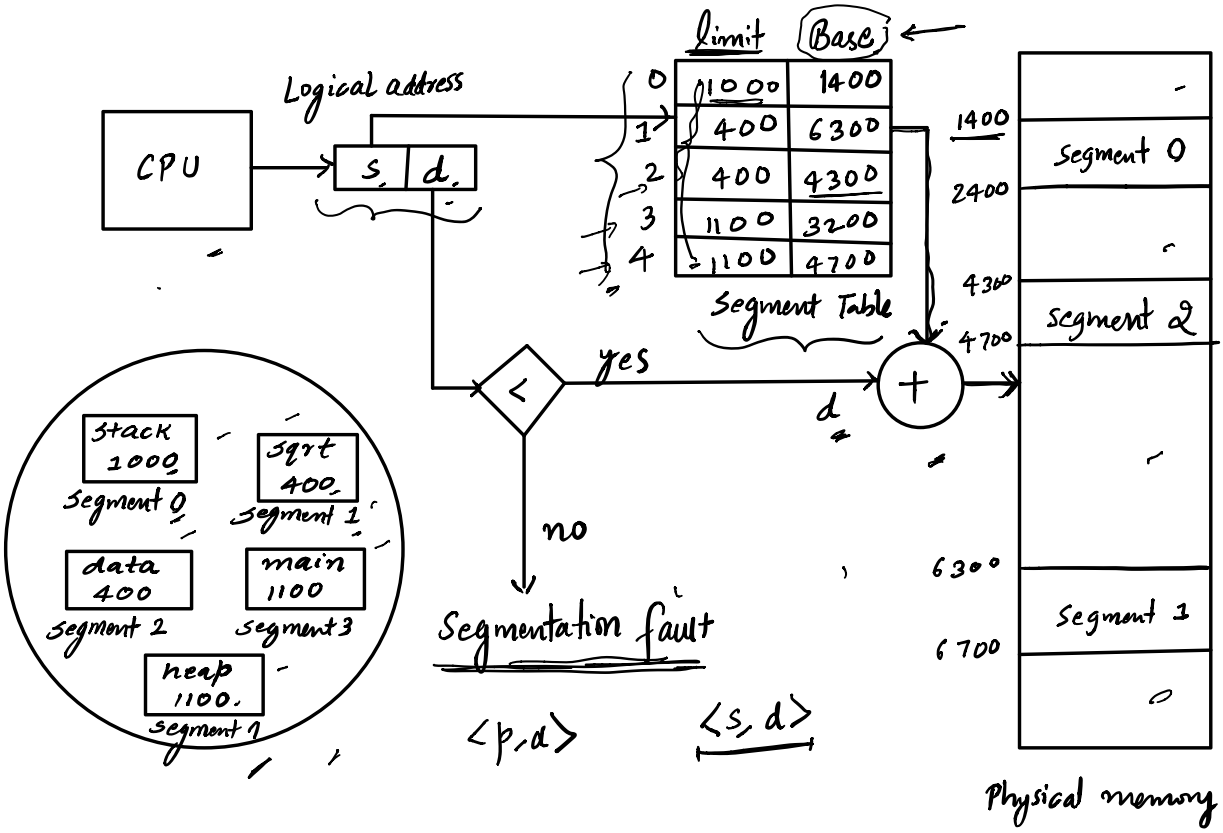
- Segmentation is a memory-management technique that supports this user view of memory.

- Here, logical address space is a collection of segments
- Each segment has a name and length
- Logical address - segment name + offset
- In Paging, user specified a single address which was partitioned into page number and offset by the hardware









Advantages

- No internal fragmentation since we are using variable partitioning
- Segment table consumes less space in memory than page tables

Disadvantages

- Suffers from external fragmentation since variable partitioning is used here
- Paging can be combined with segmentation to remove external fragmentation