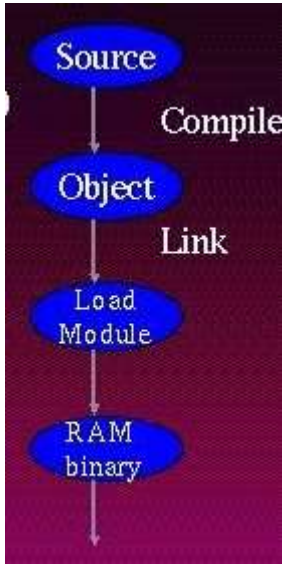
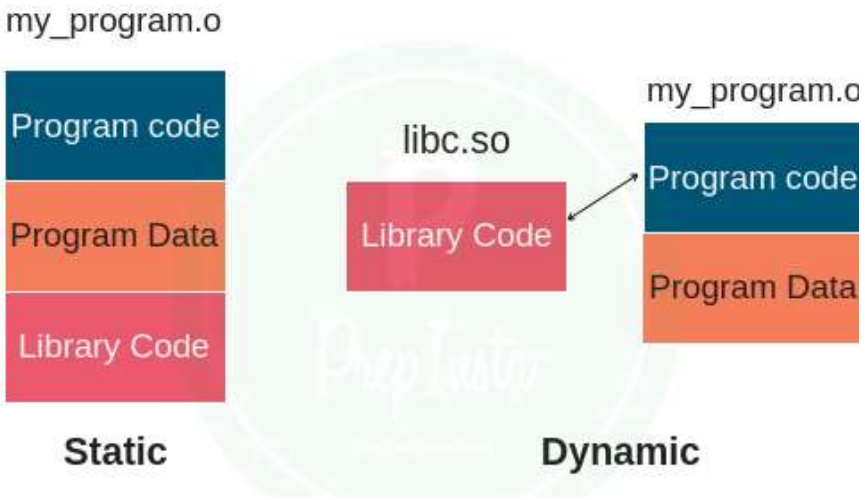
SNS COLLEGE OF TECHNOLOGY

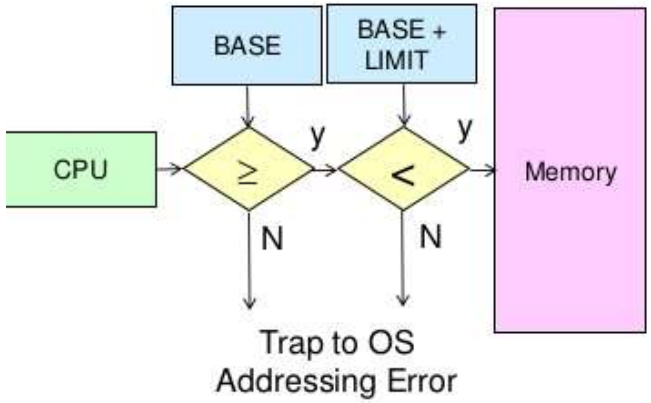
(Autonomous)

COIMBATORE-35

Memory Management Segmentation





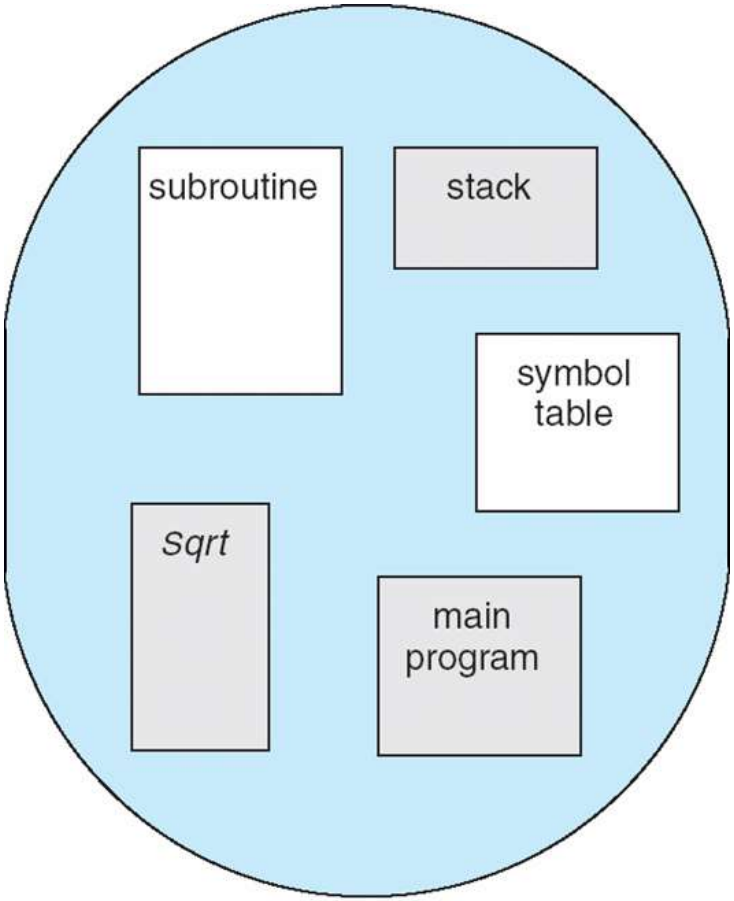


Segmentation

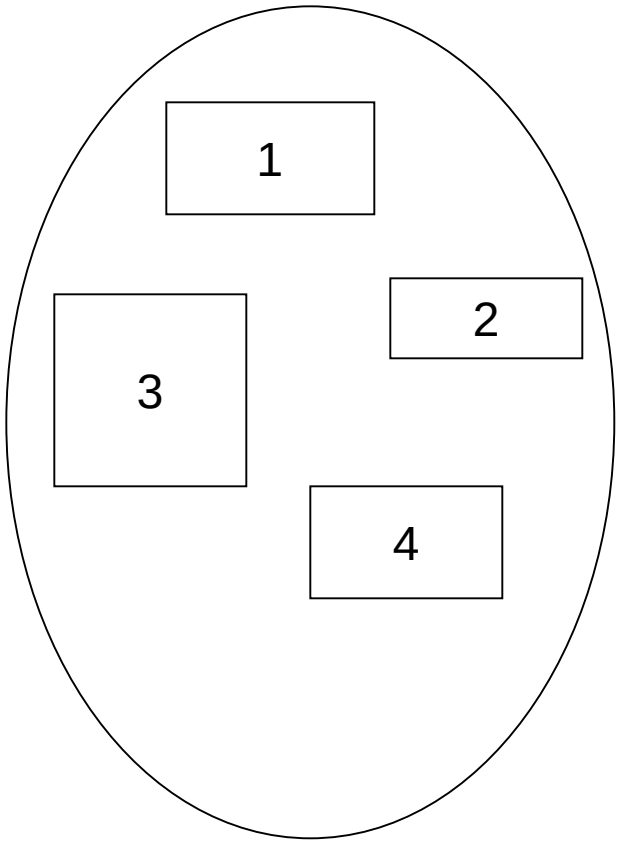
- Memory-management scheme that supports user view of memory
- A program is a collection of segments
  - A segment is a logical unit such as:

main program	**object**
procedure	**local variables, global variables**
function	**common block**
method	**stack**
symbol table	**arrays**

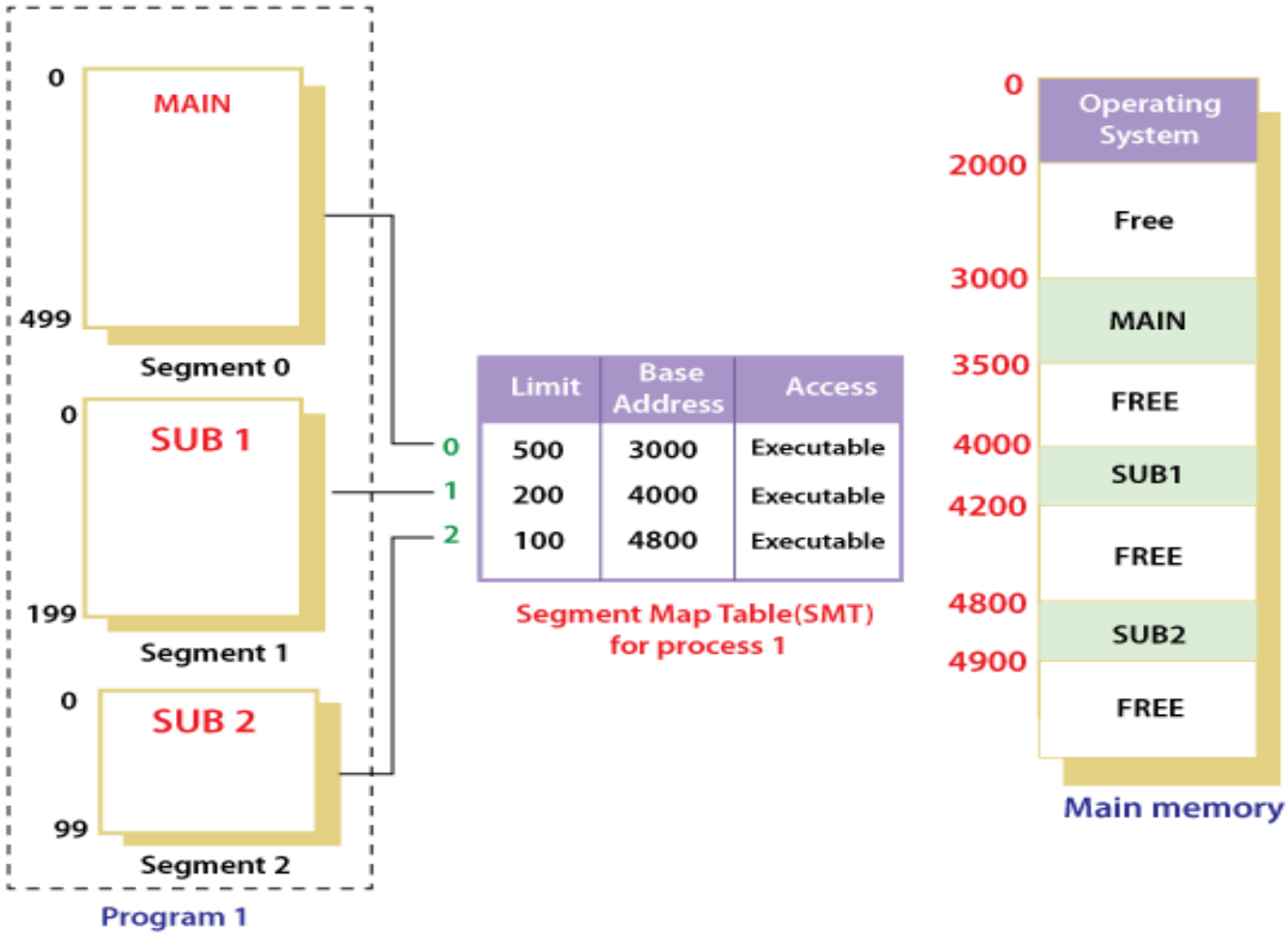
User's View of a Program



Logical View of Segmentation



Segmentation



Segmentation Architecture

- Logical address consists of a two tuple:

  <segment-number, offset>,

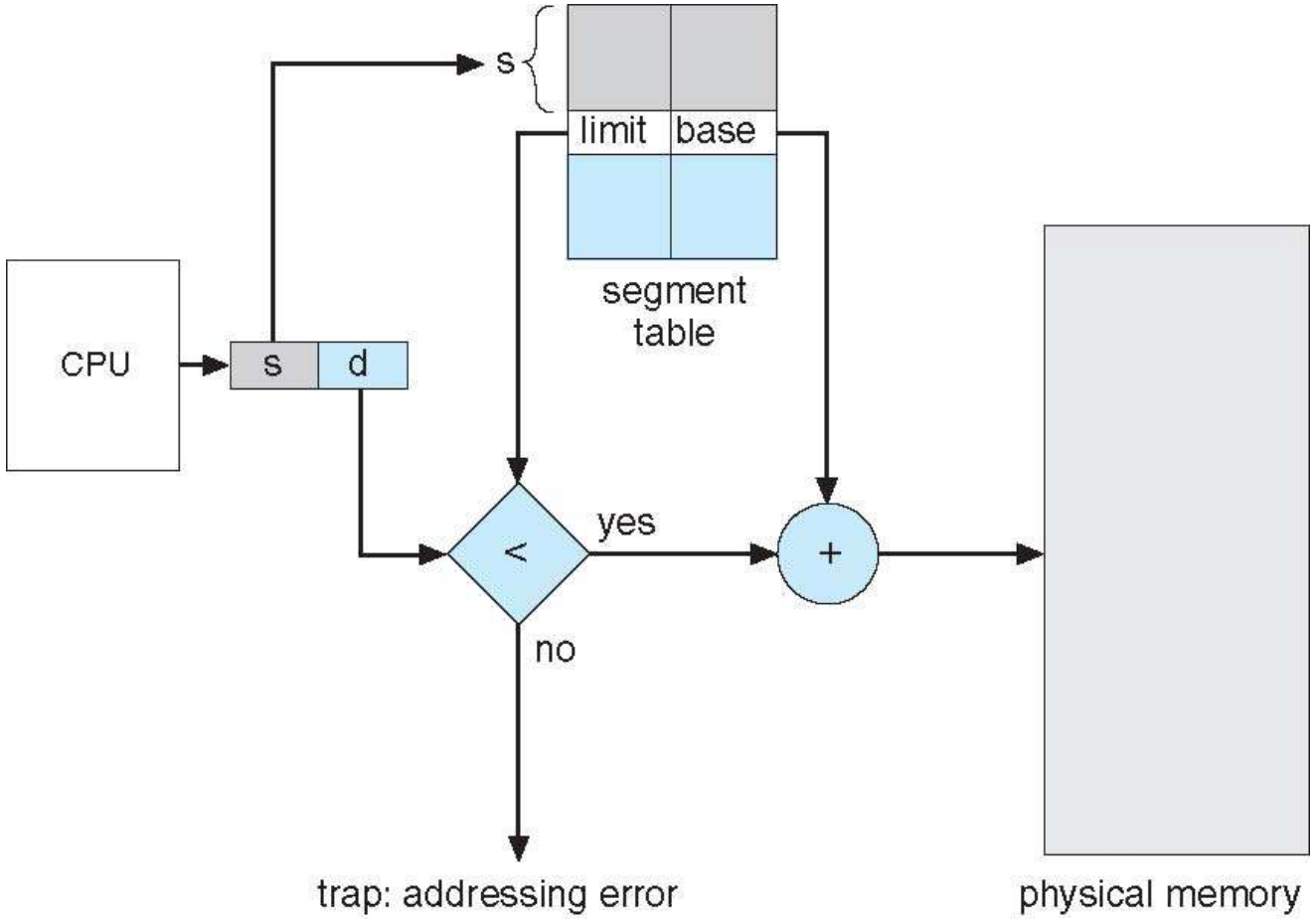
- **Segment table** – maps two-dimensional physical addresses; each table entry has:
  - **base** –starting physical address where the segments reside in memory
  - **limit** – specifies the length of the segment
- **Segment-table base register (STBR)** points to the segment table's location in memory
- **Segment-table length register (STLR)** indicates number of segments used by a program;

  segment number ***s*** is legal if ***s*** < **STLR**

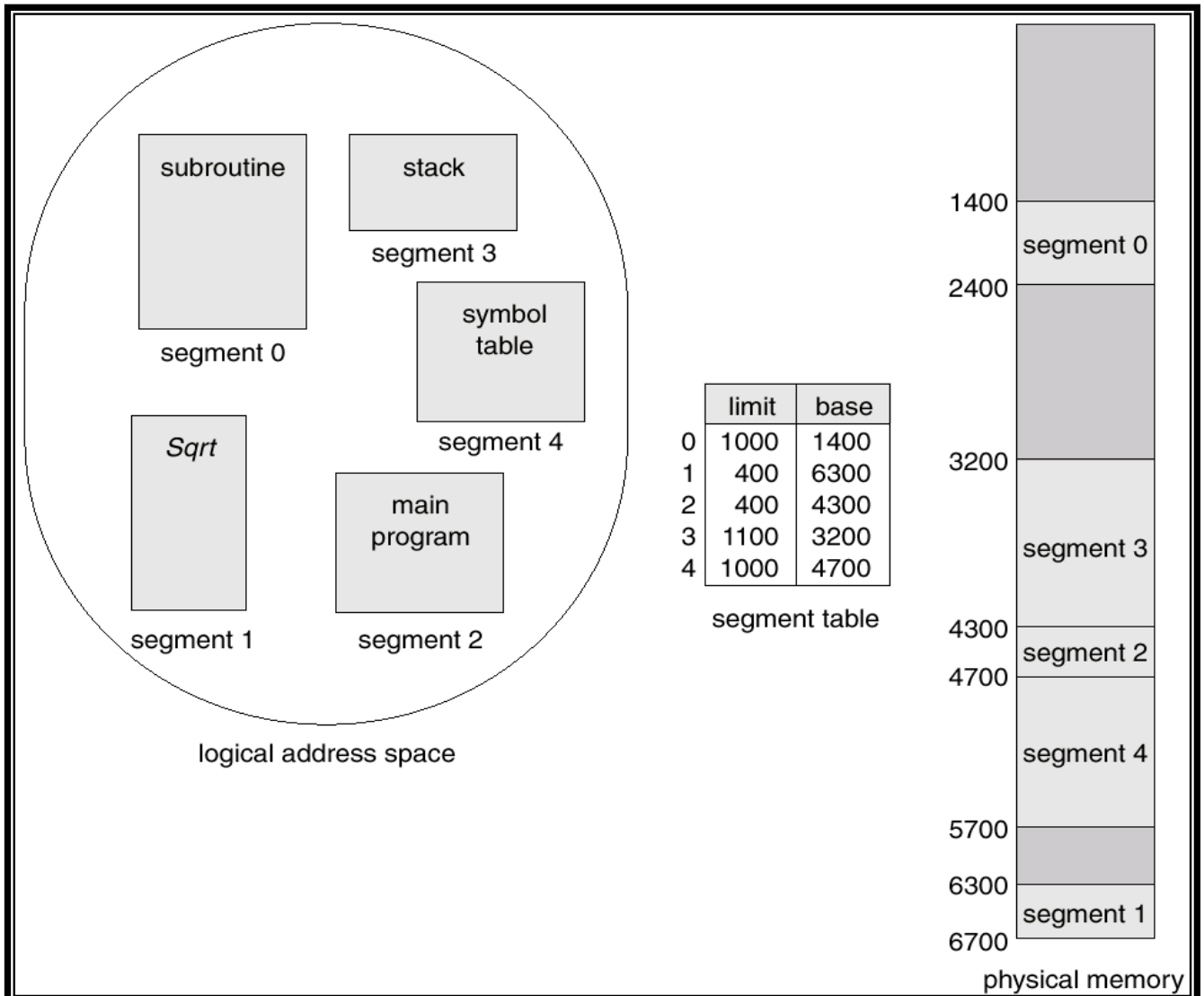
Protection

- Protection
  - With each entry in segment table associate:
    - validation bit = 0 ⇒ illegal segment
    - read/write/execute privilege
    - Since segments vary in length, memory allocation is a dynamic storage-allocation problem
    - Protection bits associated with segments; code sharing occurs at segment level.
    - Since segments vary in length, memory allocation is a dynamic storage-allocation problem.
    - A segmentation example is shown in the following diagram

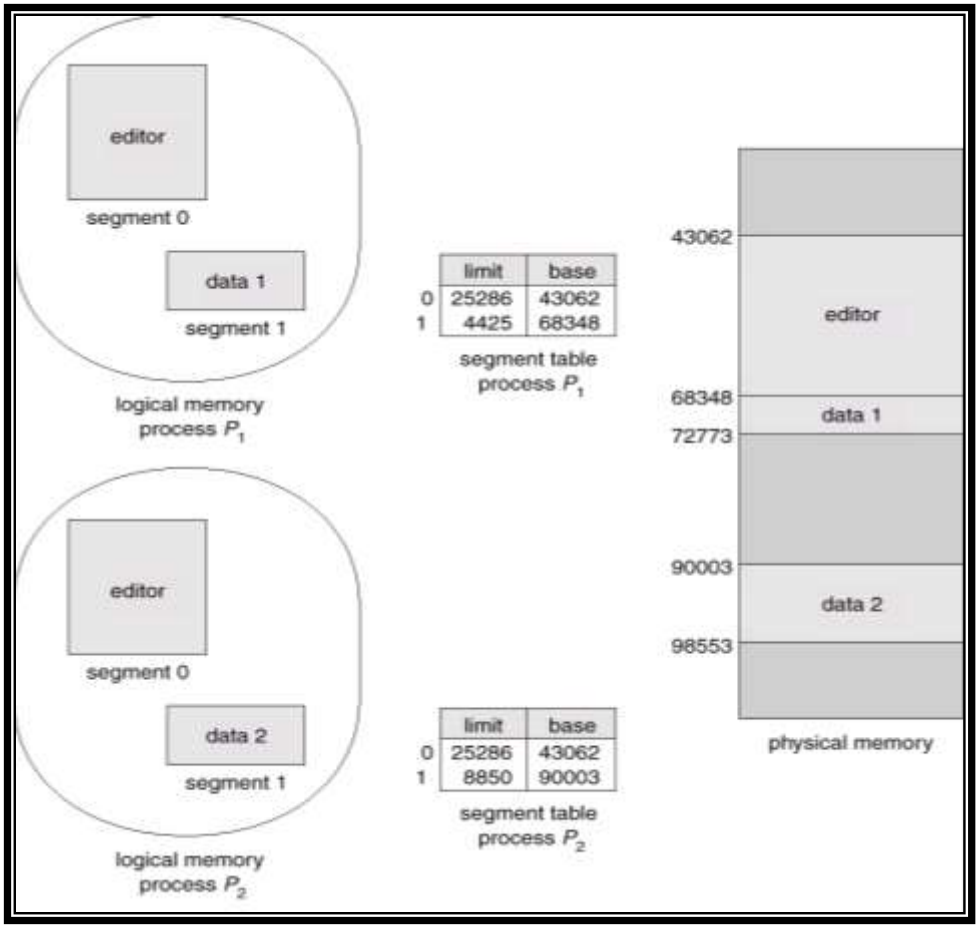
Segmentation Hardware



Example of Segmentation



Sharing of Segments



Summarization