



The diagram illustrates the execution of a nested loop structure, likely a C-style loop with pointer arithmetic. It shows four stages of the loop's execution:

- Initial State:** A box labeled  $i$  contains a pointer to a block of memory. The pointer is labeled  $j$ , and the block is labeled  $m-1$ . The pointer  $j$  is also labeled  $i$  with a circled  $i$  next to it.
- First Iteration:** The pointer  $j$  is moved to a new location, labeled  $i$  with a circled  $i$ . The block of memory is now labeled  $i \times j$ . The pointer  $j$  is labeled  $j+i$ . Annotations above the box show  $CT=0$  (red) and  $ER=i$  (blue) with a vertical line, and  $CC=0$  (red) and  $EC=j$  (green) with a horizontal line.
- Second Iteration:** The pointer  $j$  is moved to a new location, labeled  $i$  with a circled  $i$ . The block of memory is labeled  $i, m-1$ . Annotations above the box show  $CT=0$  (red) and  $ER=i$  (blue) with a vertical line, and  $CC=i+1$  (red) and  $EC=m$  (blue) with a horizontal line.
- Final State:** The pointer  $j$  is moved to a new location, labeled  $i+1$  with a circled  $i$ . The block of memory is labeled  $m-1$ . Annotations above the box show  $CT=i+1$  (red) and  $ER=n-1$  (blue) with a vertical line, and  $CC=0$  (red) and  $EC=m-1$  (blue) with a horizontal line.

Below the boxes, a grid diagram shows the memory layout. The columns are labeled  $0, 1, 2, \dots, m-1$  and the rows are labeled  $0, 1, 2, \dots, n-1$ . A specific cell in the  $i$ -th row and  $j$ -th column is highlighted with a black box, representing the current memory location being processed.

