Termination: The loop terminates when j= MAX_SIZE
∴ By loop invariant and by correctness of Loop(K),
$\forall x, x \in N, 0 \langle x \langle$ MAX_SIZE, the element $c[i][x]$ is computed correctly.
∴ For row i, the $\overset{all}{\underset{\wedge}{\text{elements}}}$ of the product matrix c has been computed correctly. □

Outer Loop Invariant

• Just before the start of the iteration when $i=n$, the matrix c has been correctly computed for all rows from 0 to $(n-1)$.

Initialization: ~~$i=0$ and~~ $i=0$. ∵ $n=0$, the indexes from 0 to -1 doesn't make sense. ∴ The outer loop invariant trivially holds

Maintenance: Let, just before the start of the iteration when $i=n$, the loop invariant ~~holds~~ holds. ∴ $\forall x, x \in N, 0\langle x \langle n-1$, the corresponding matrix elements for row $c[x]$ has been computed correctly. Now, $i=n$. By correctness of the two inner loops, $\forall y, y \in N, 0 \langle y \langle$ MAX_SIZE, $c[\overset{n}{\underset{\wedge}{0}}][y]$ has been computed correctly. ∴ Row ~~n~~ n is also computed correctly.

. The variable i gets updated to $(n+1)$. We see, $\forall x, x \in N, 0 \langle x \langle (n+1)-1$, the corresponding matrix elements for row $c[x]$ has been correctly computed. ∴ Loop invariant still holds.

Termination: The loop terminates when $i=$ MAX_SIZE. ∴ By Loop invariant, the matrix c has been correctly computed for all rows from 0 to (MAX_SIZE -1). By using correctness of the two inner loops, $\forall x\, \forall y, 0 \langle x, y \langle$ MAX_SIZE

$$\boxed{c[x][y] = \sum_{K=0}^{MAX\_SIZE-1} a[x][K] * b[K][y]}$$, ∴ The product matrix is correctly computed □