

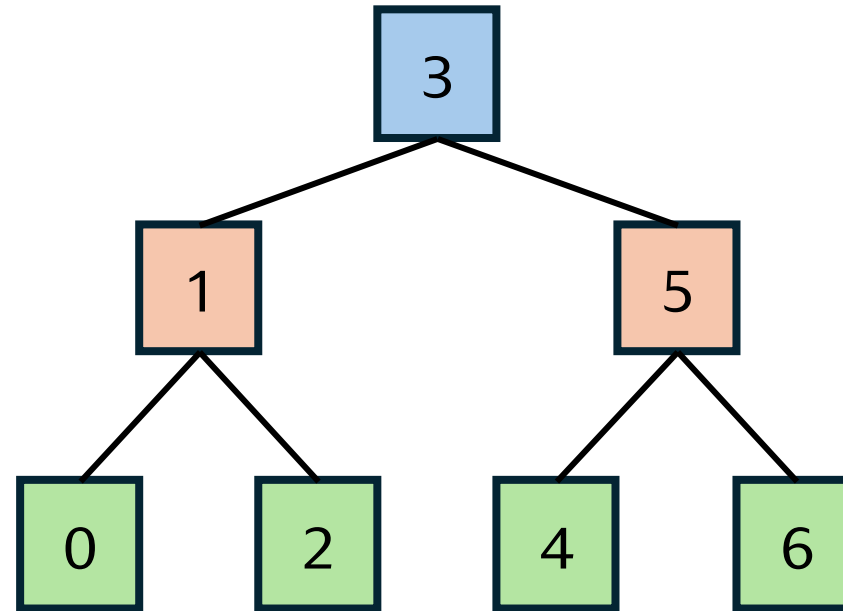
ECE 312 (SP26):

Hash Table

Neil Zhao

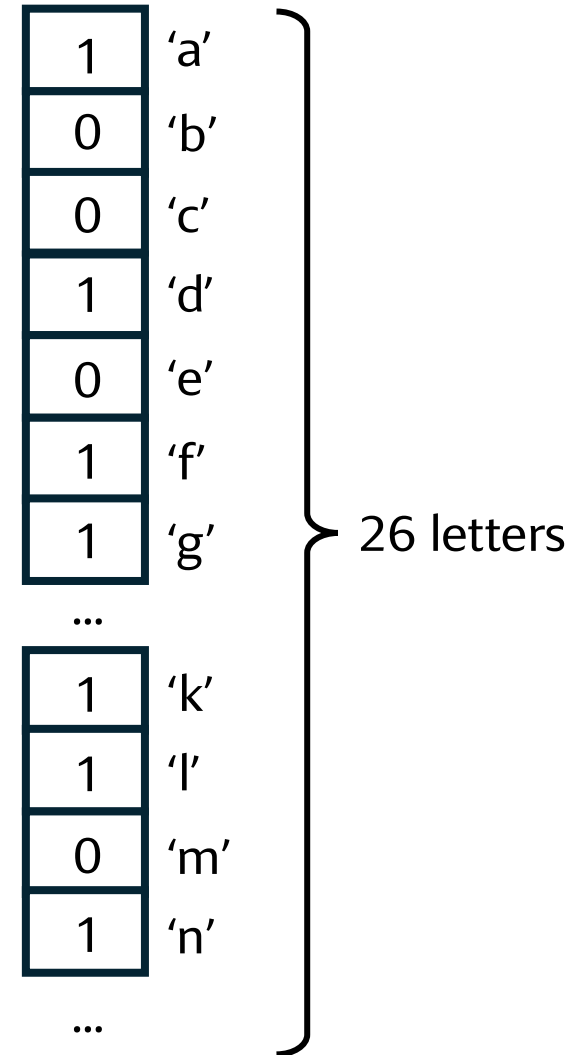
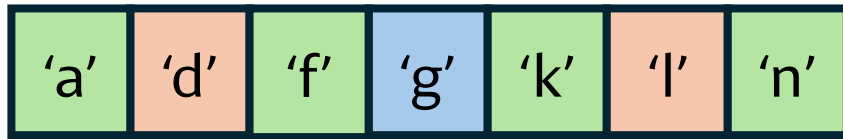
neil.zhao@utexas.edu

Revisiting Binary Search

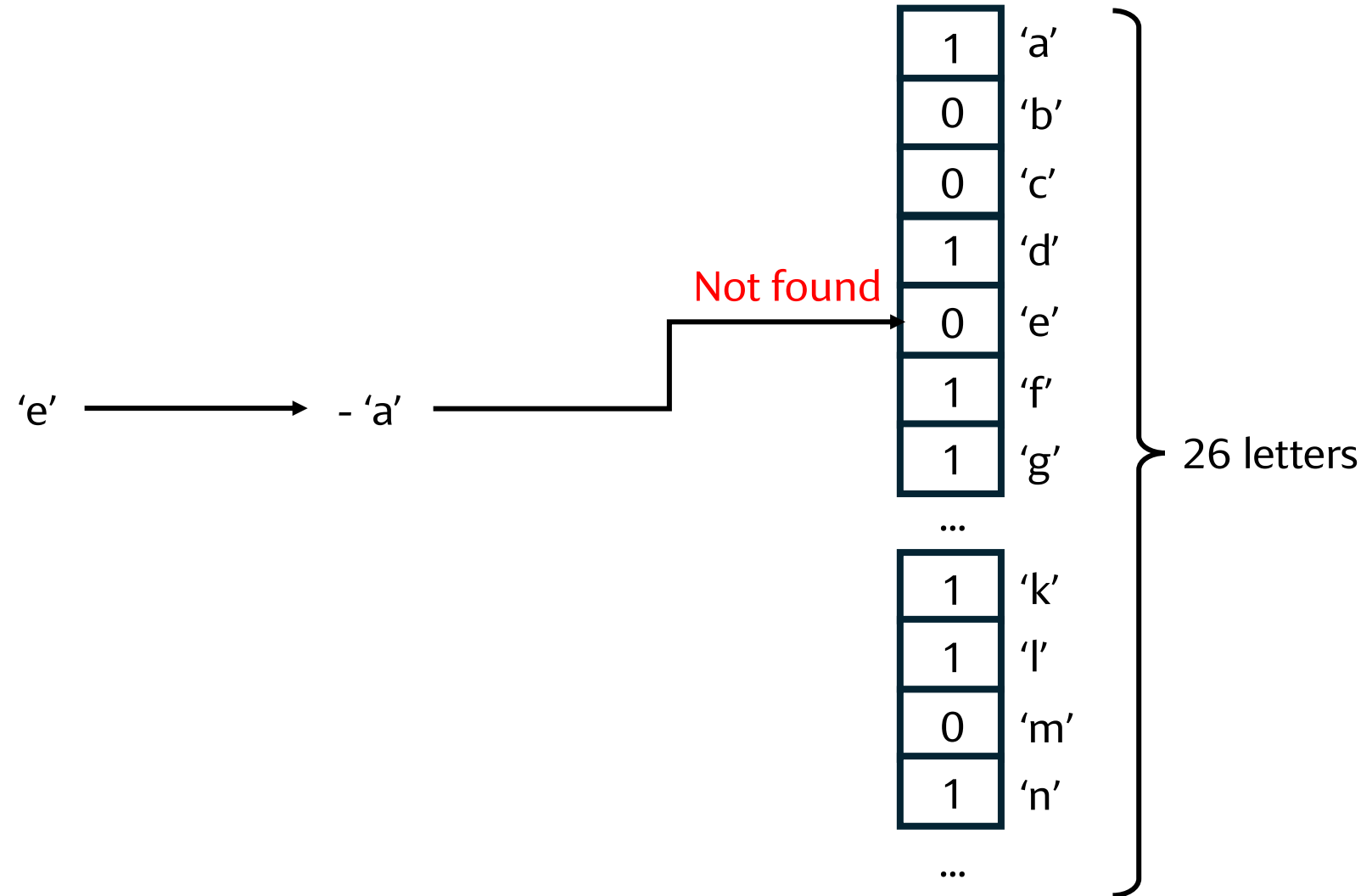


Complexity: $O(\log(N))$

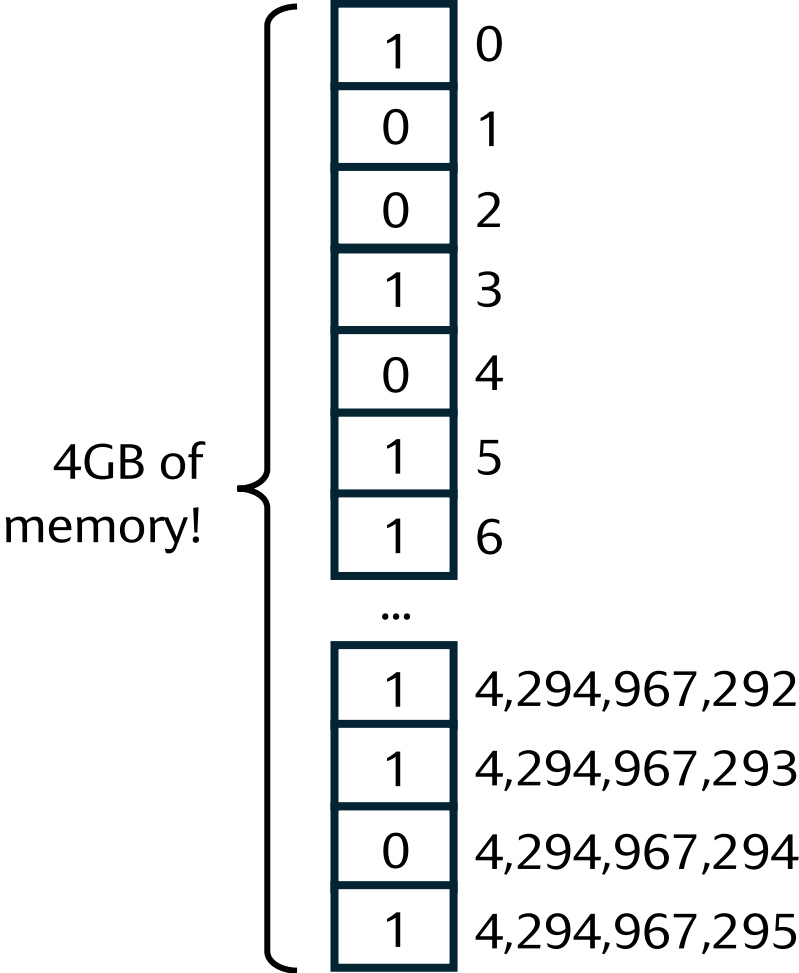
Example: Finding if a Lowercase Letter is in a List



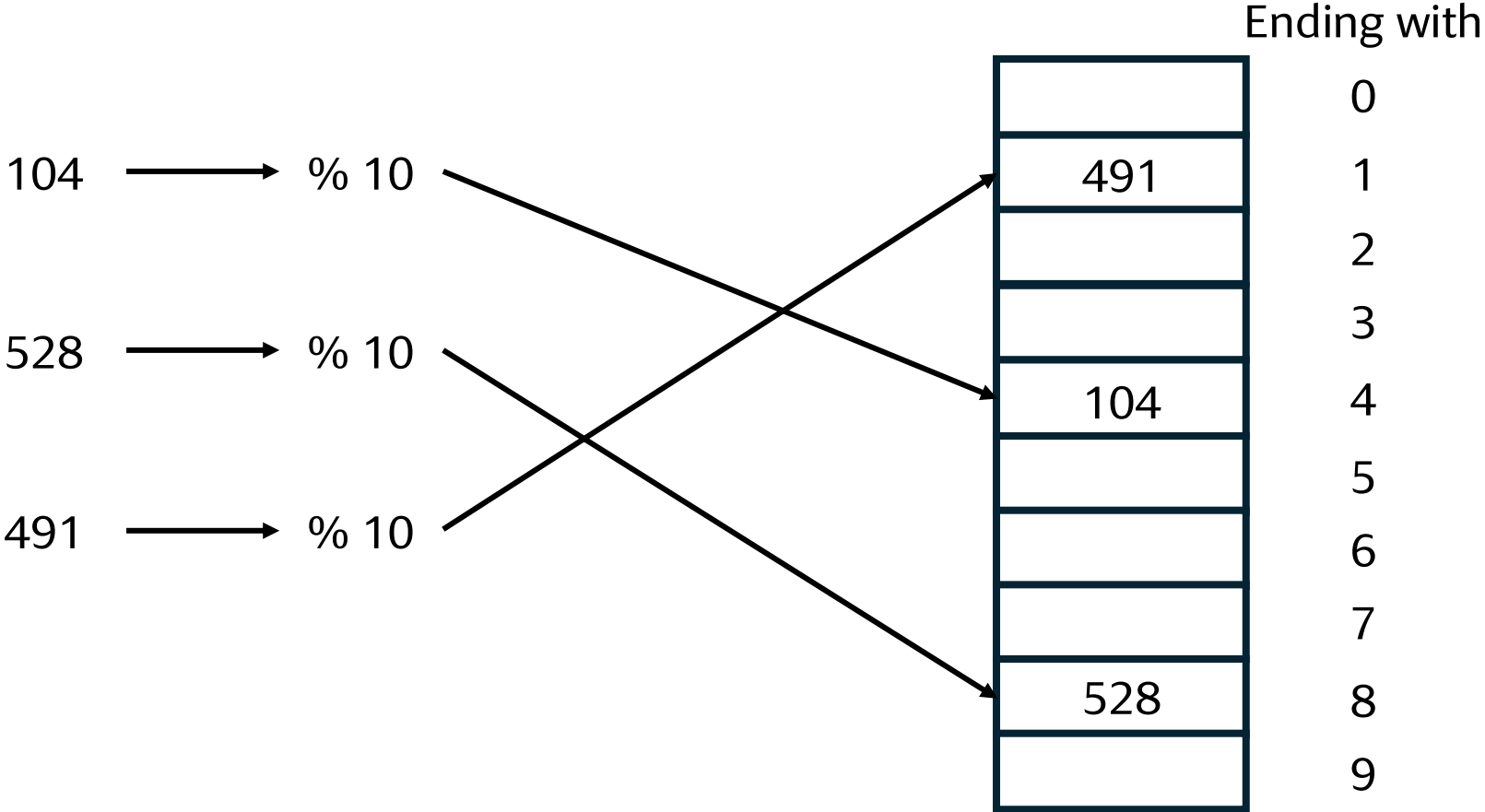
Example: Finding if a Lowercase Letter is in a List



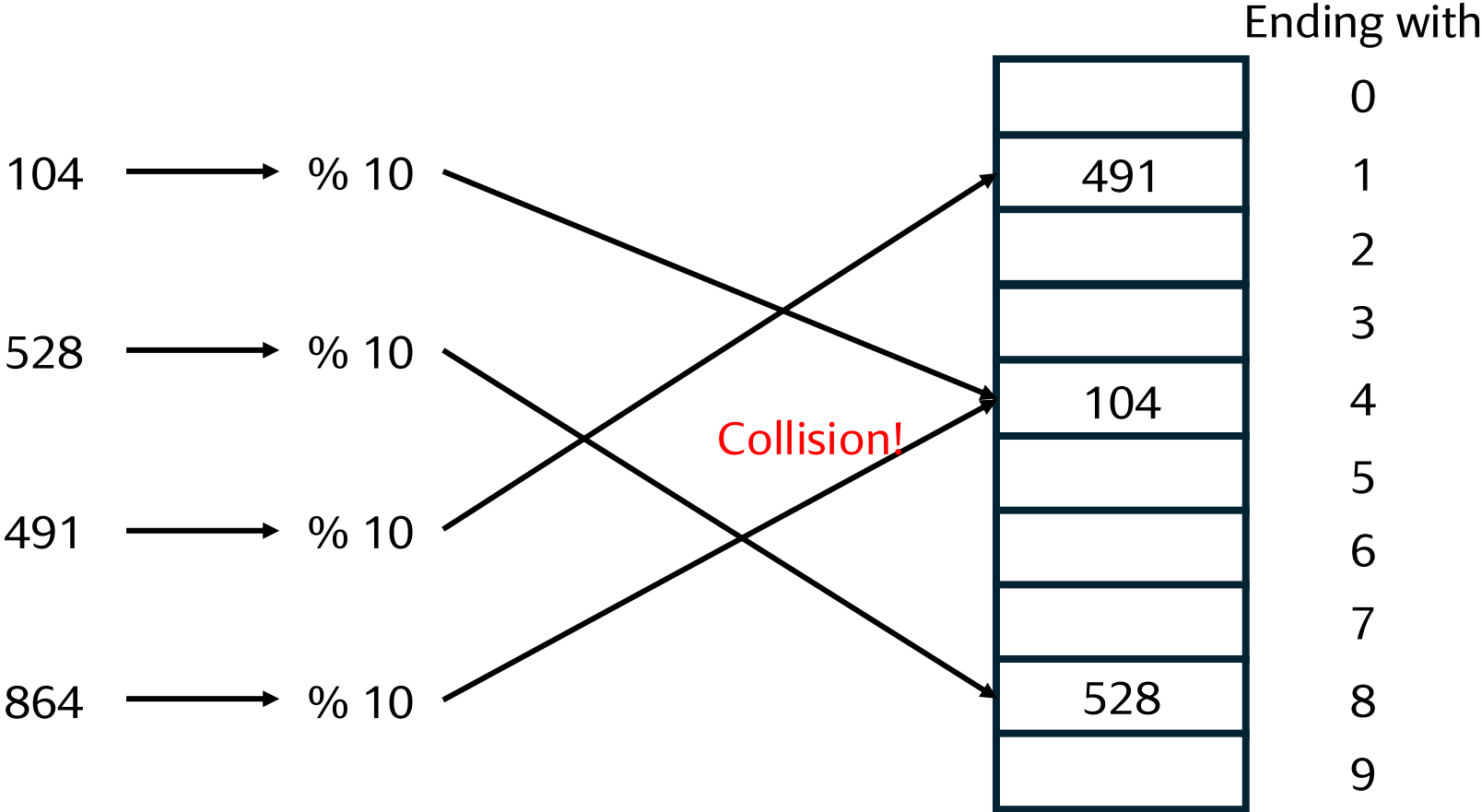
What if We Want to Do the Same Thing with a 32-bit Integer



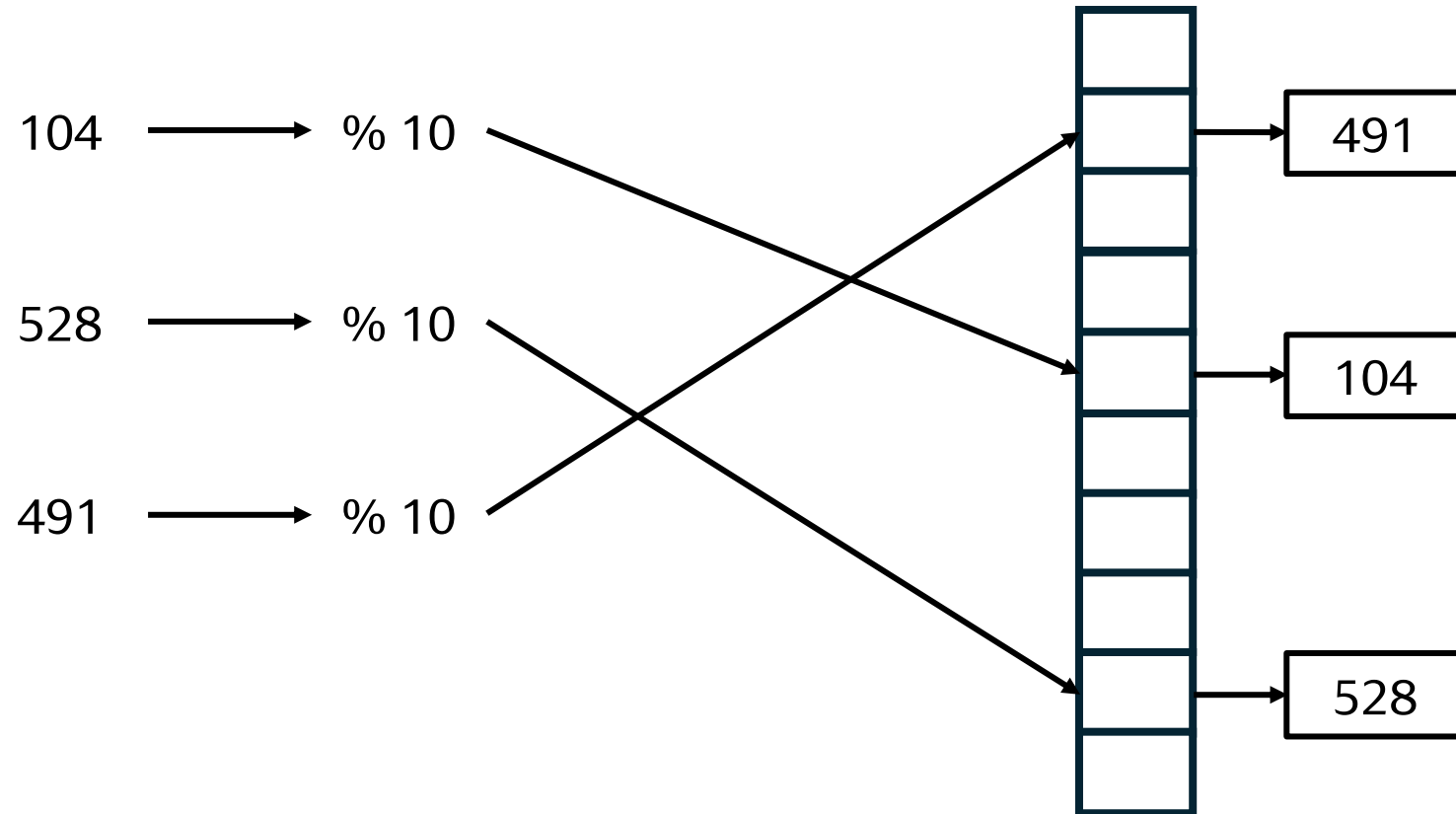
Hash Table



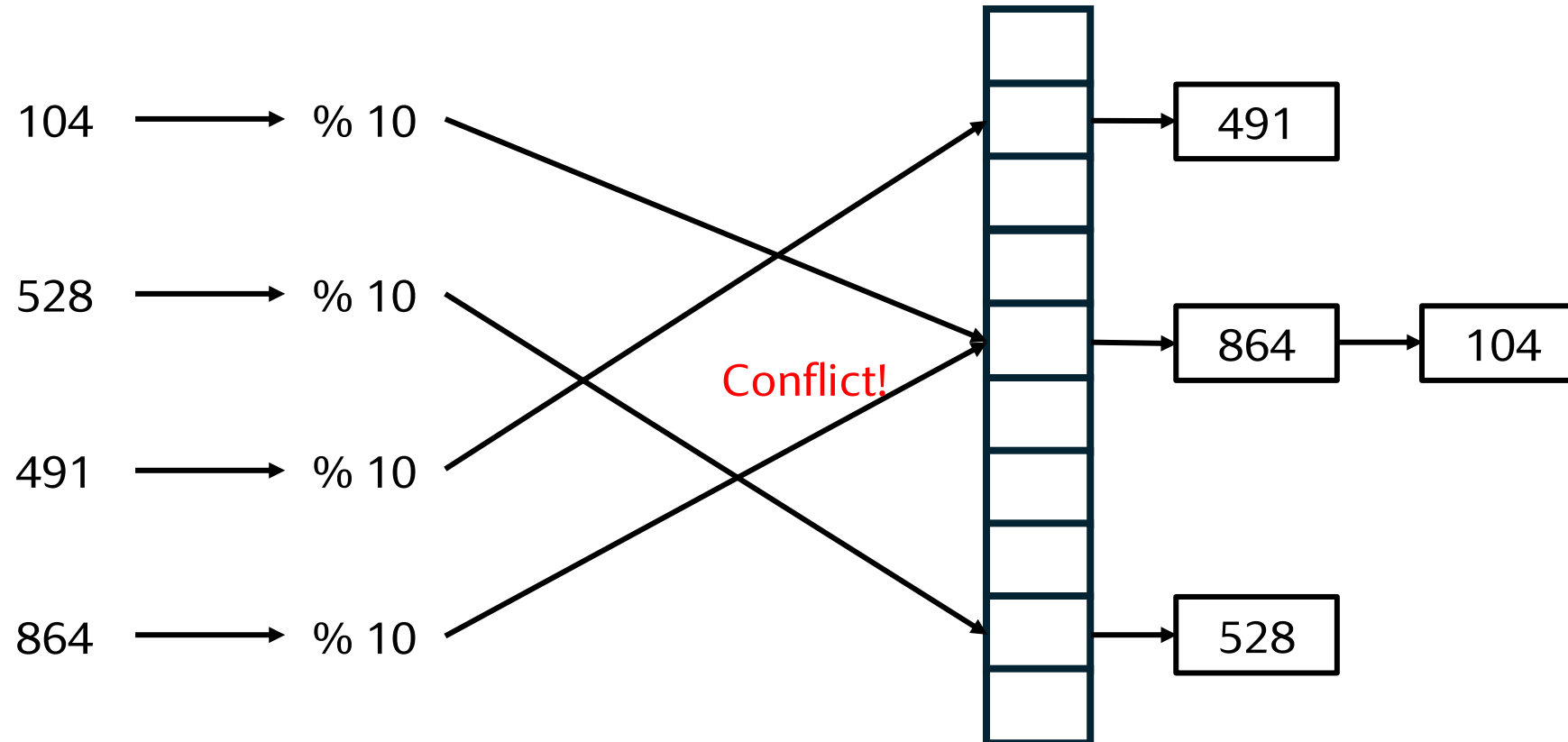
Hash Table - Collisions



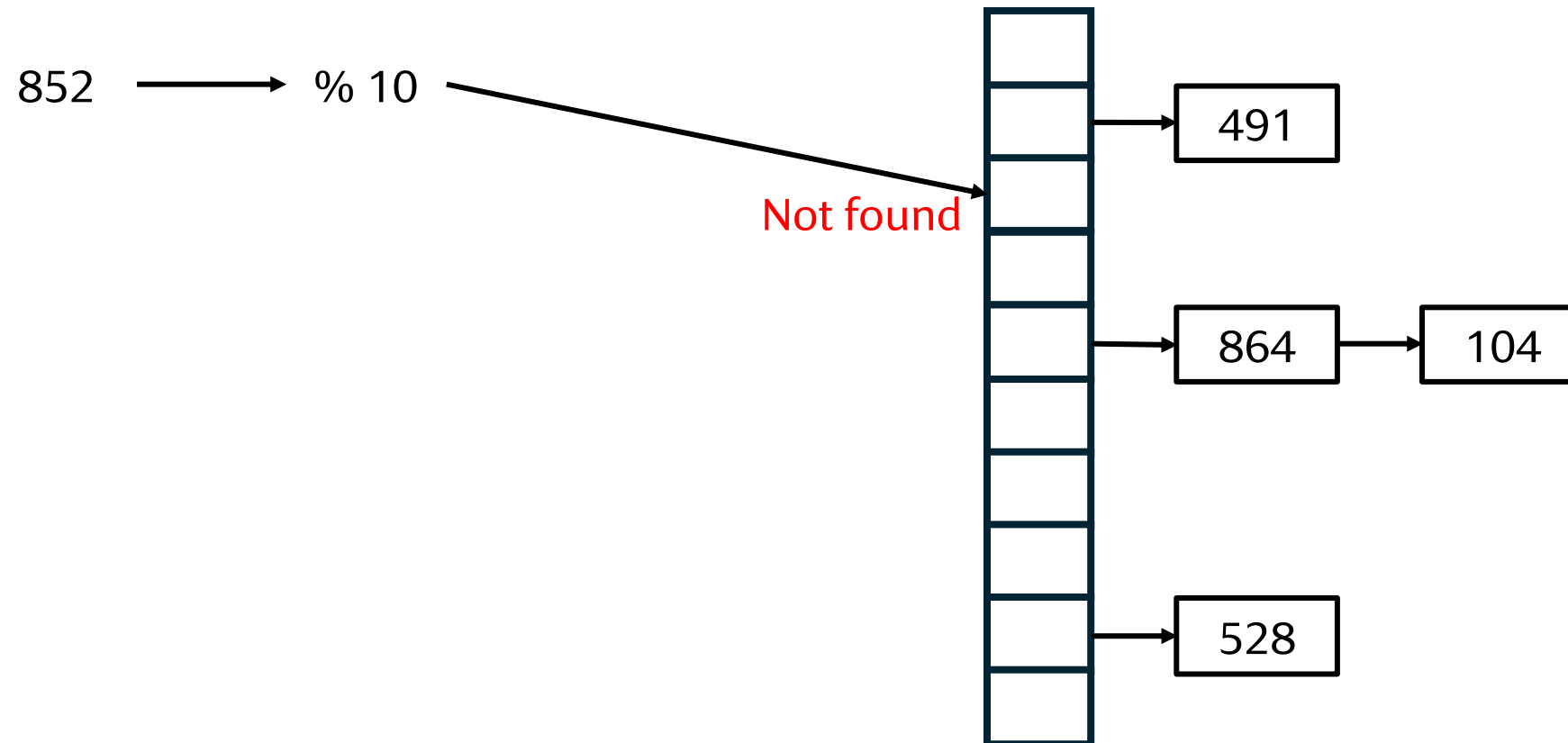
Hash Table – Resolving Collisions



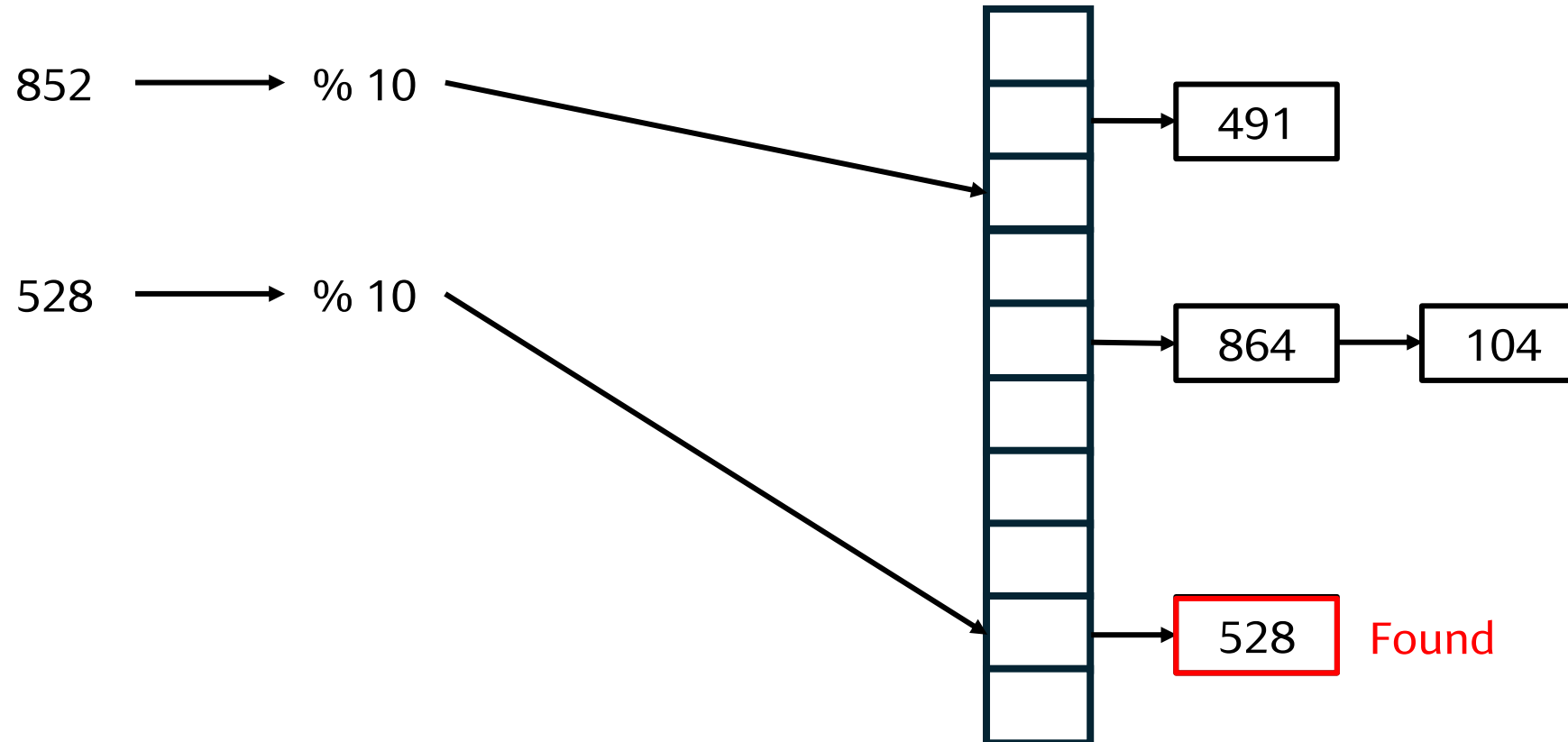
Hash Table – Resolving Collisions



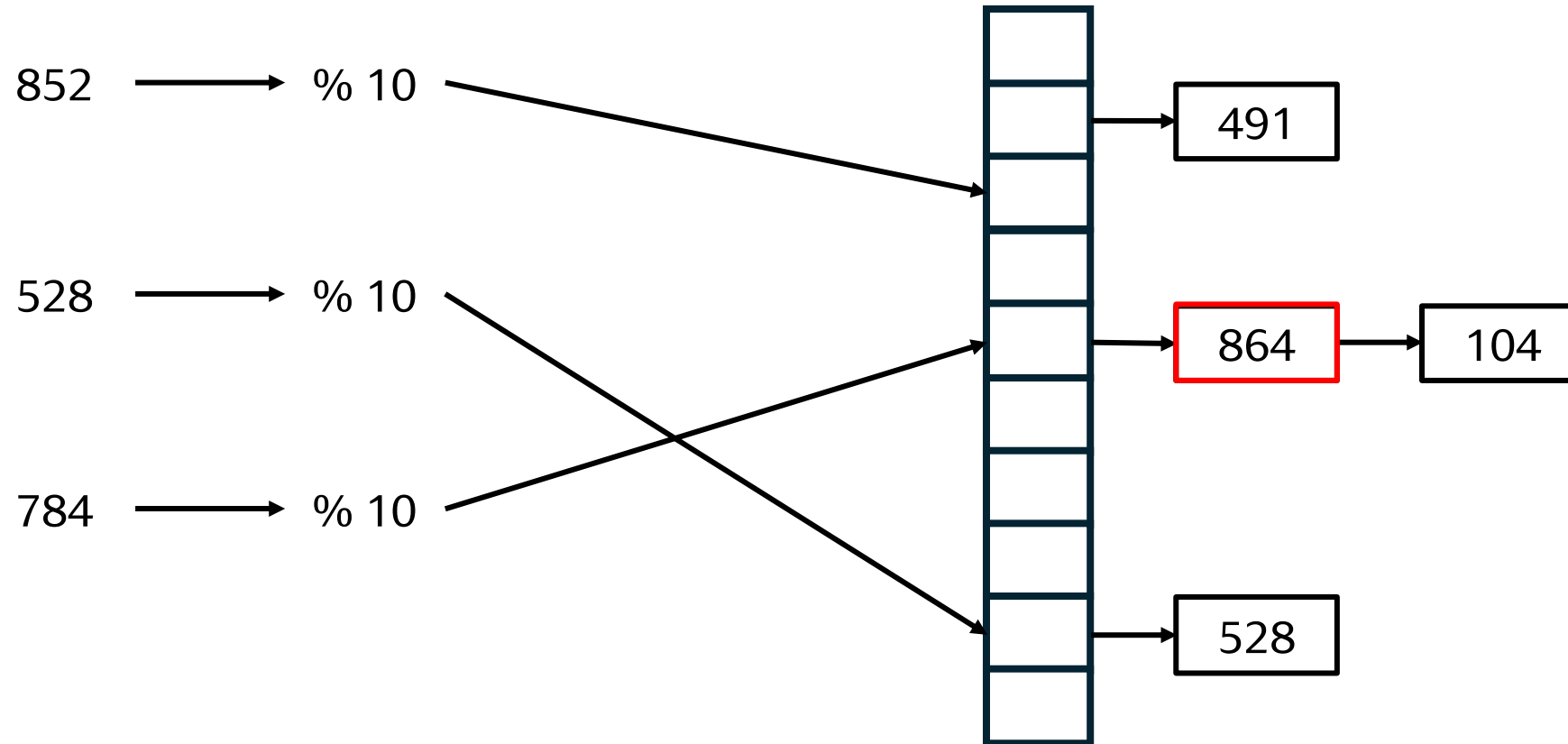
Hash Table – Lookup



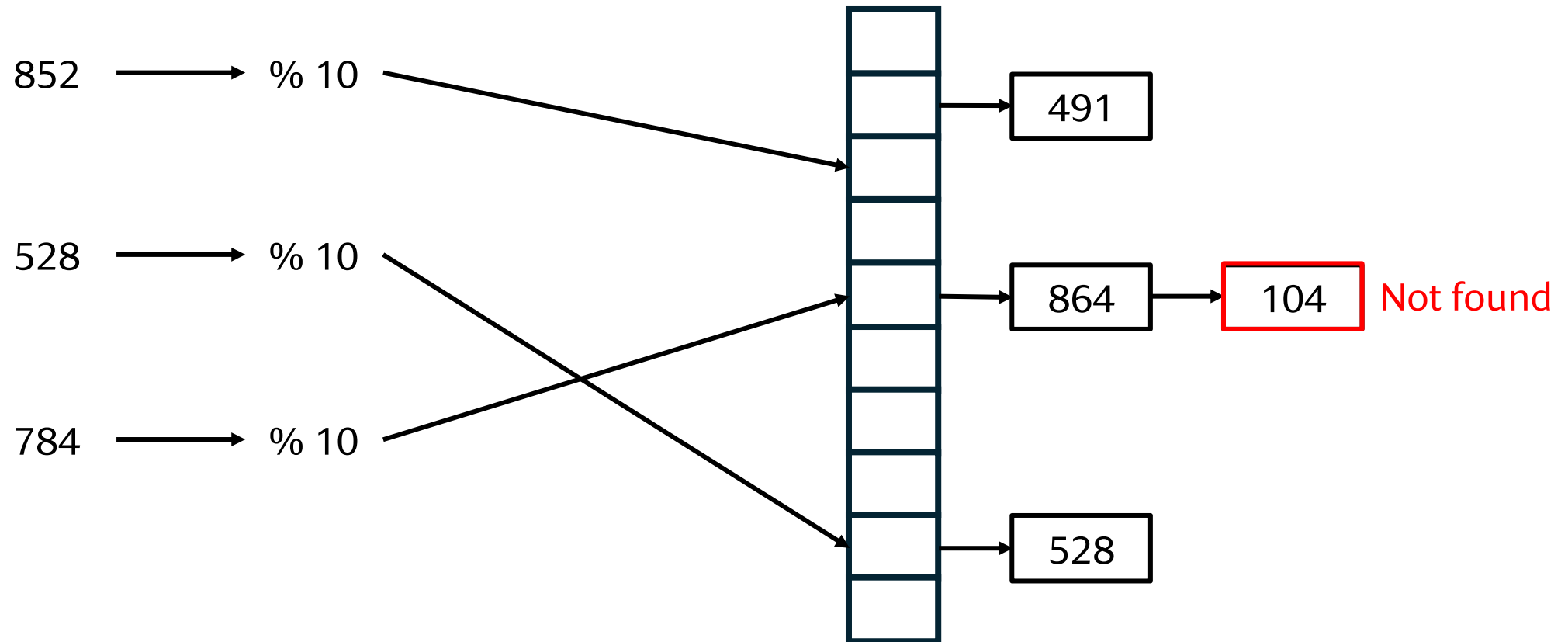
Hash Table – Lookup



Hash Table – Lookup

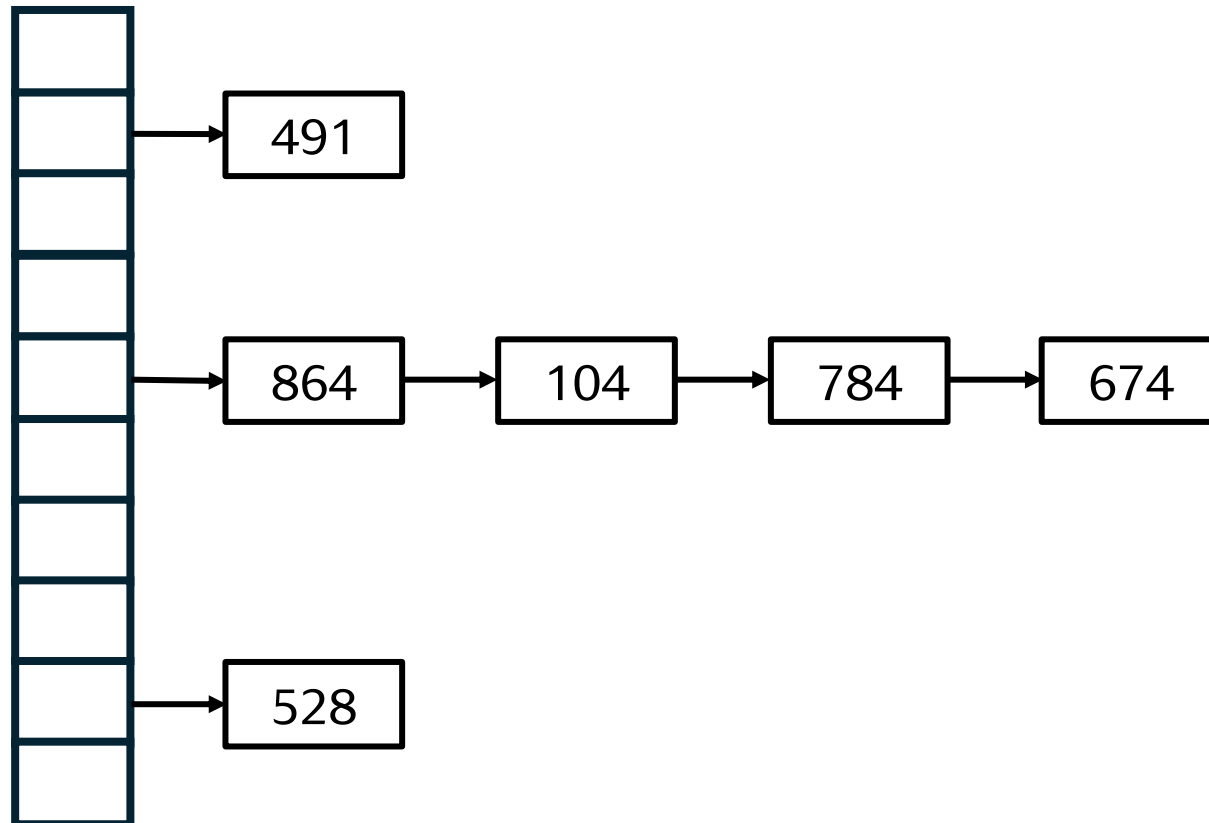


Hash Table – Lookup

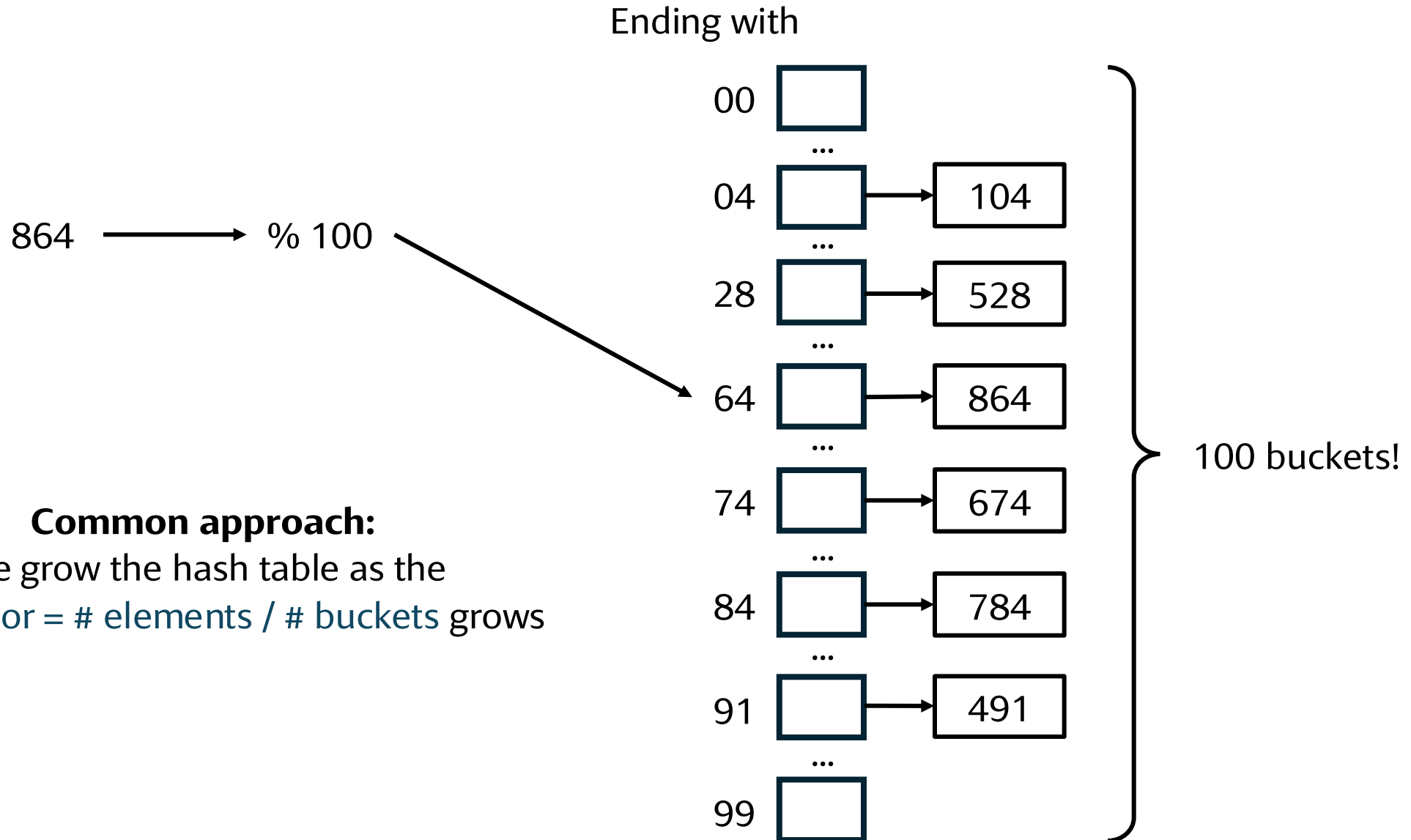


Best case: $O(1)$, Worst case: $O(N)$

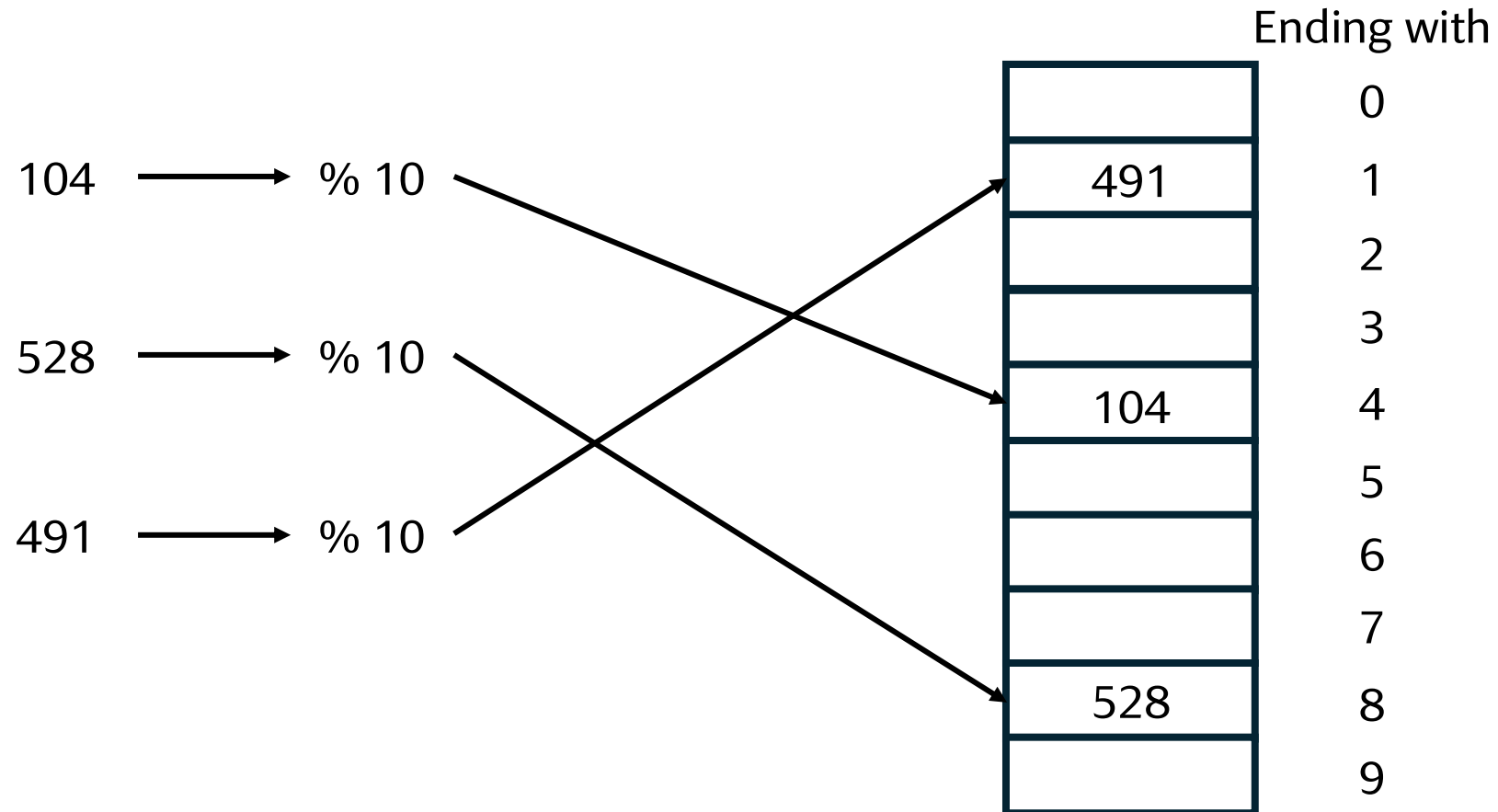
Hash Table – Reducing Collisions



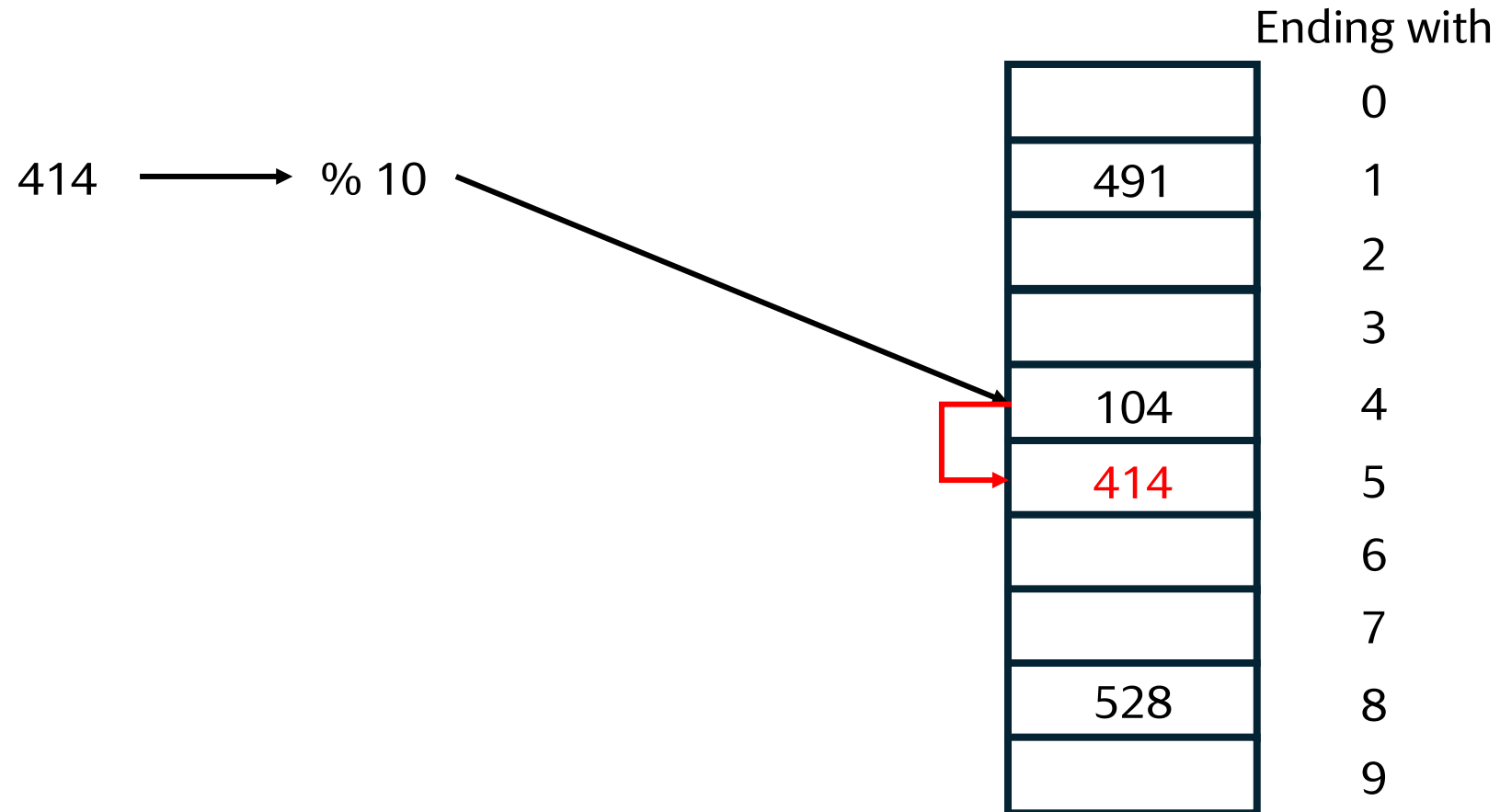
Hash Table – Reducing Collisions



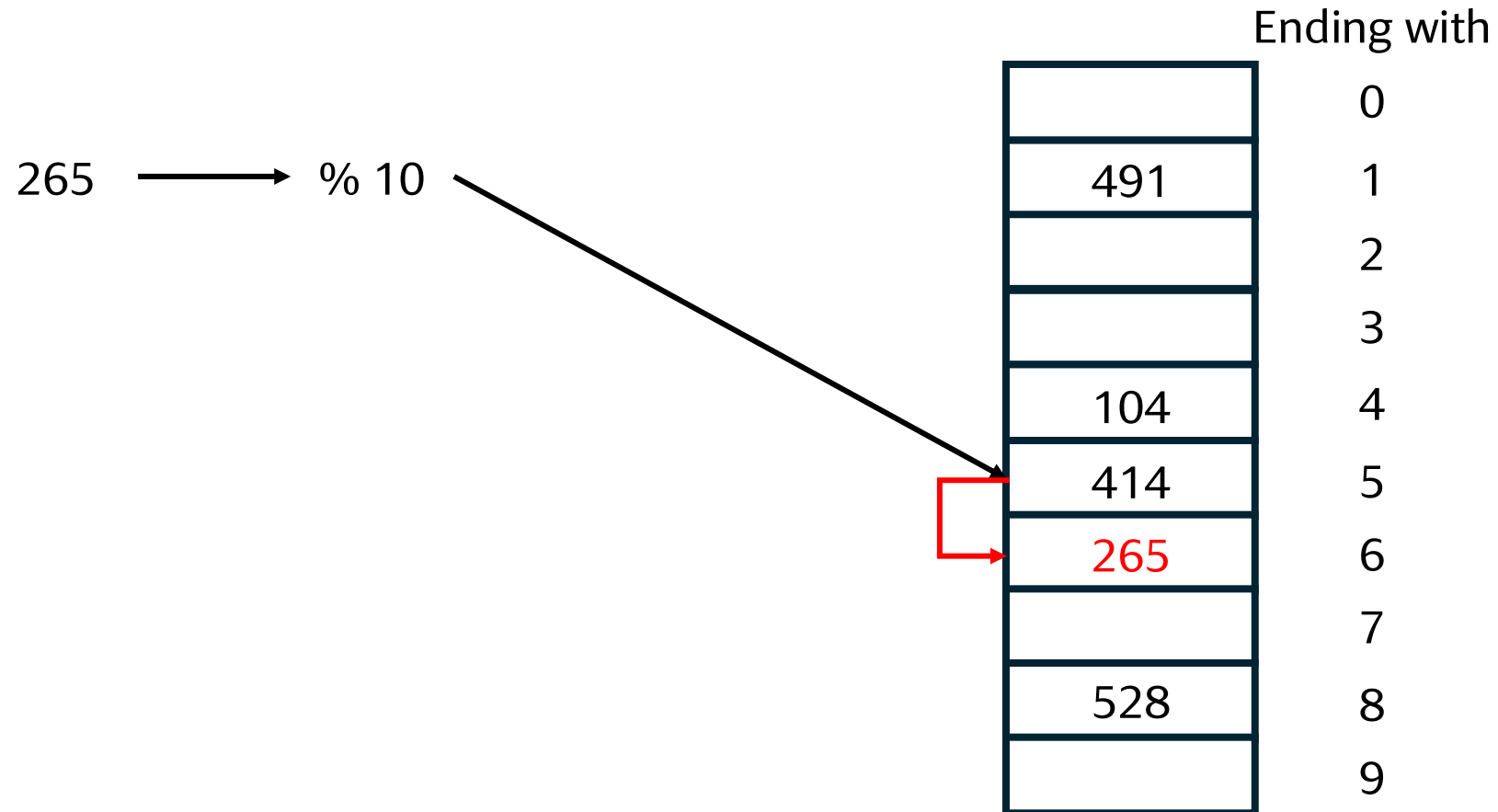
Resolving Collisions – Open Addressing (Linear Probing)



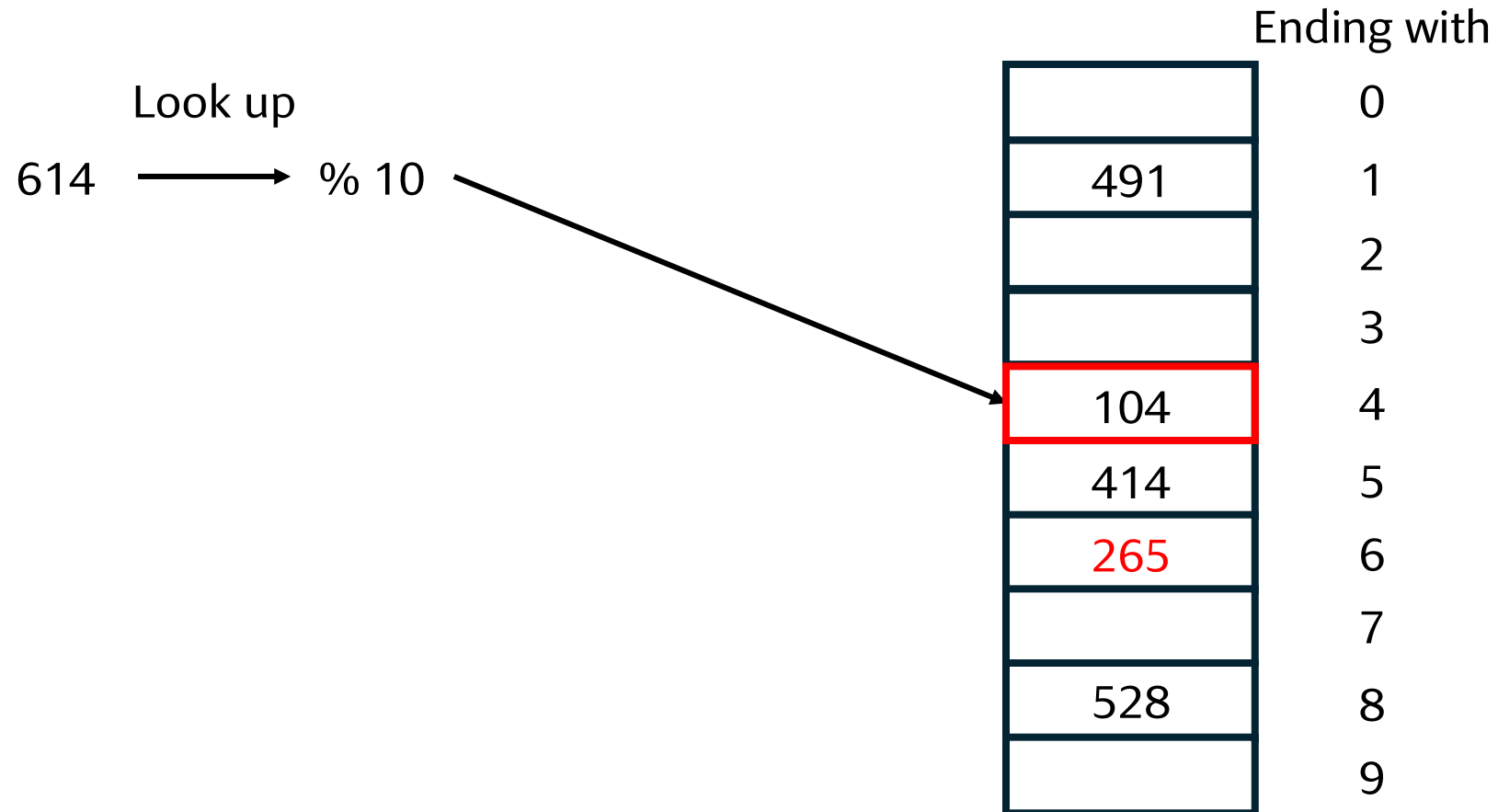
Resolving Collisions – Open Addressing (Linear Probing)



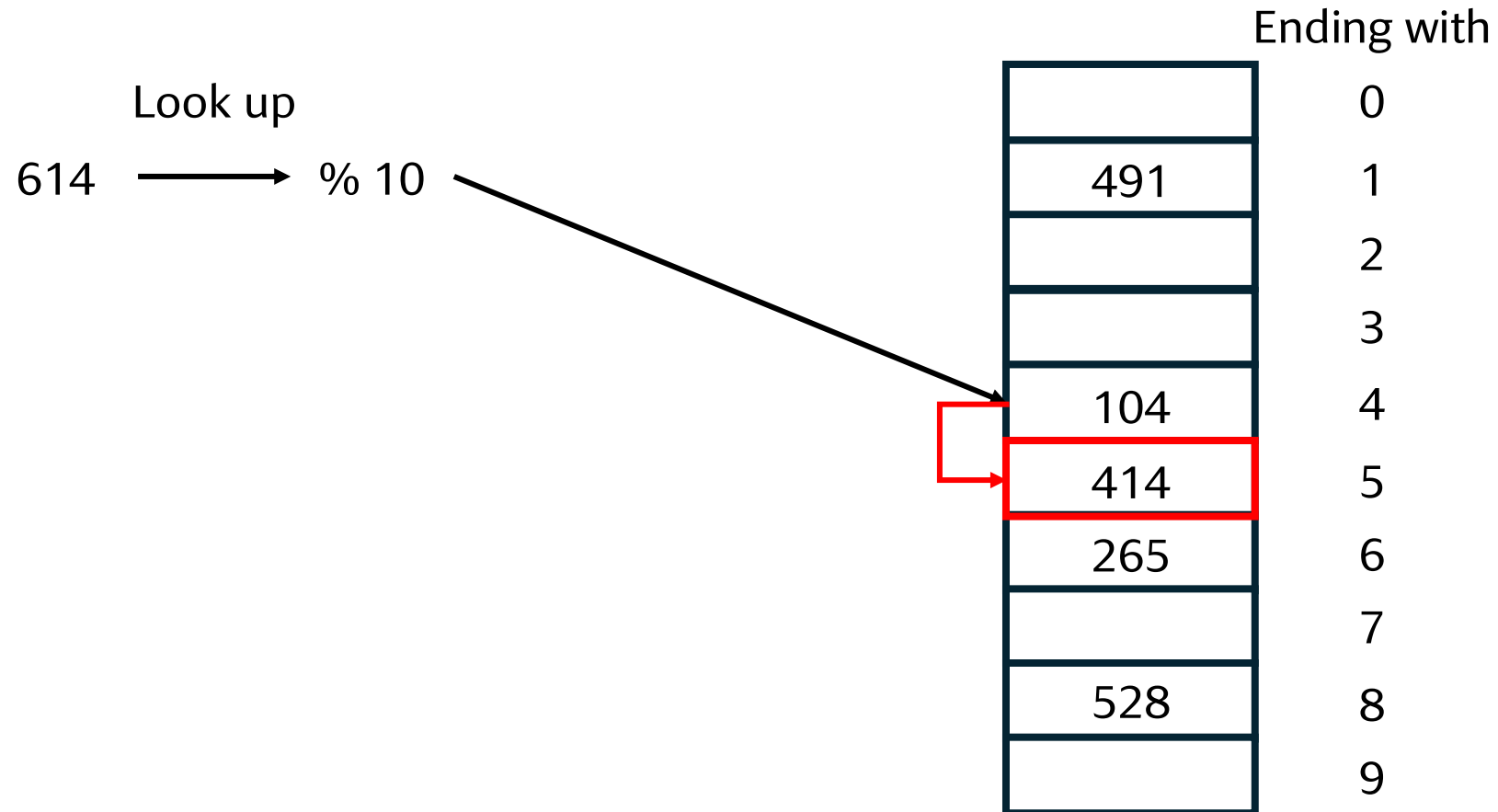
Resolving Collisions – Open Addressing (Linear Probing)



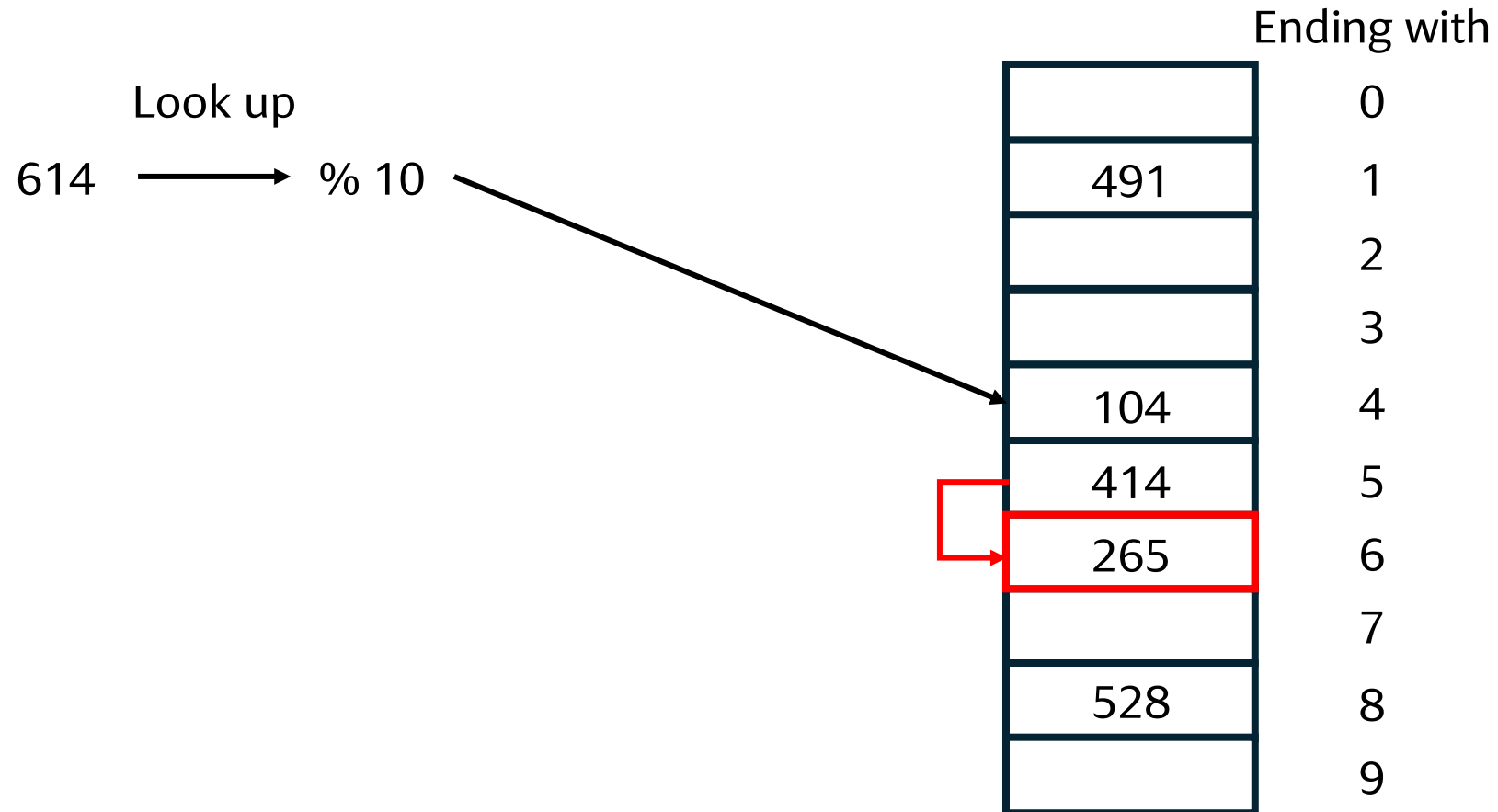
Resolving Collisions – Open Addressing (Linear Probing)



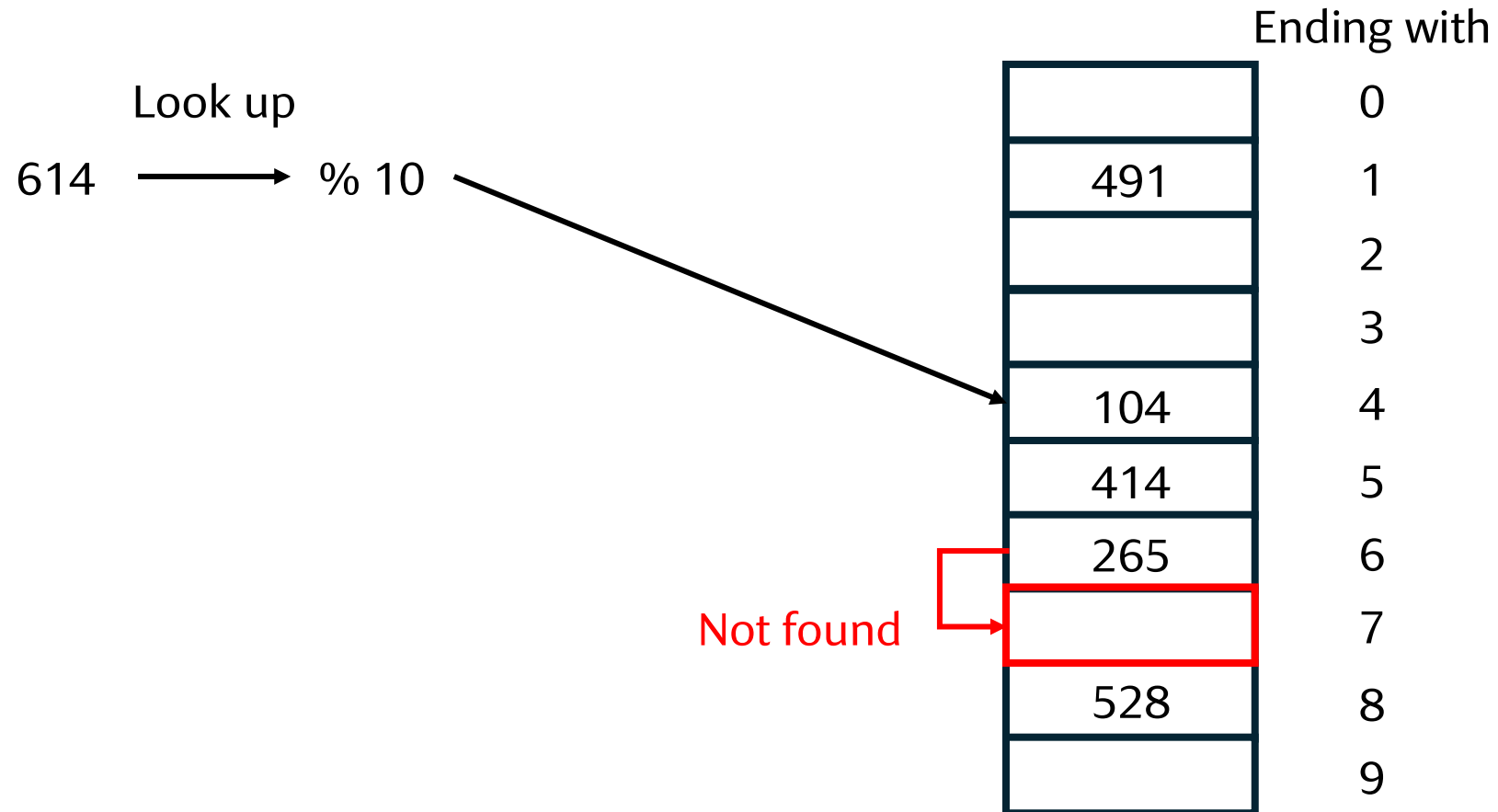
Resolving Collisions – Open Addressing (Linear Probing)



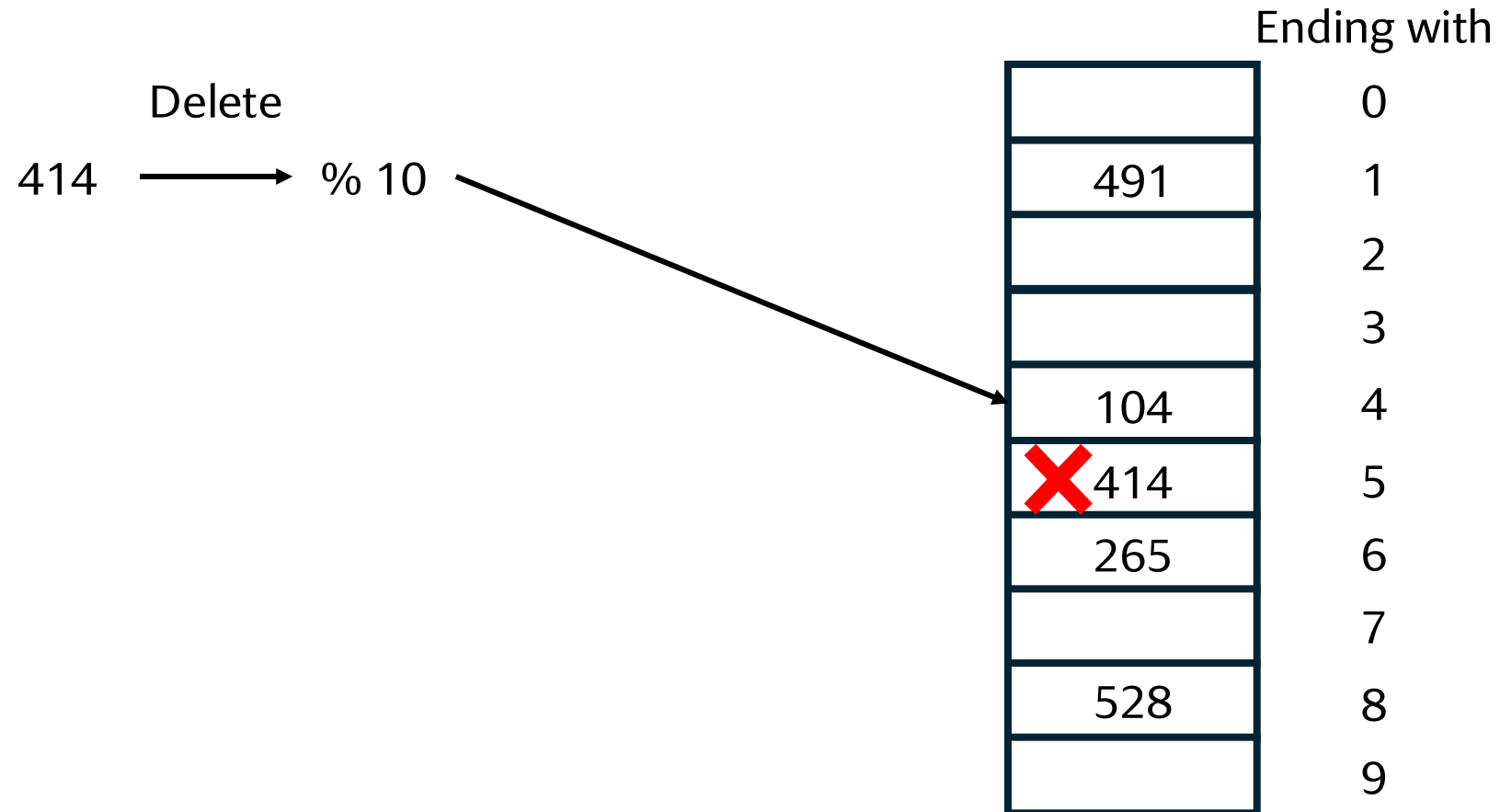
Resolving Collisions – Open Addressing (Linear Probing)



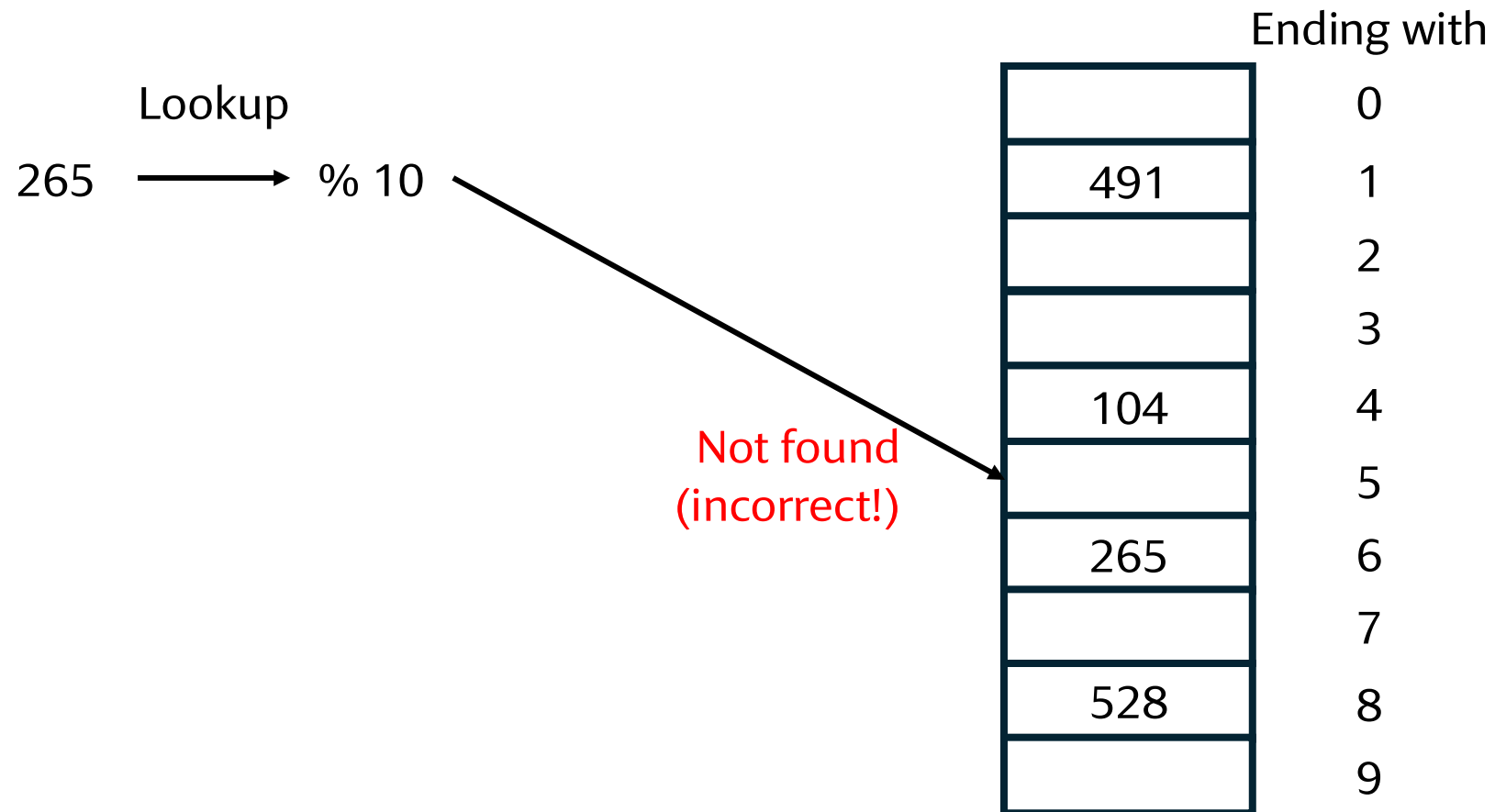
Resolving Collisions – Open Addressing (Linear Probing)



Open Addressing – Deletion (Linear Probing)



Open Addressing – Deletion (Linear Probing)



Open Addressing - Tombstone

