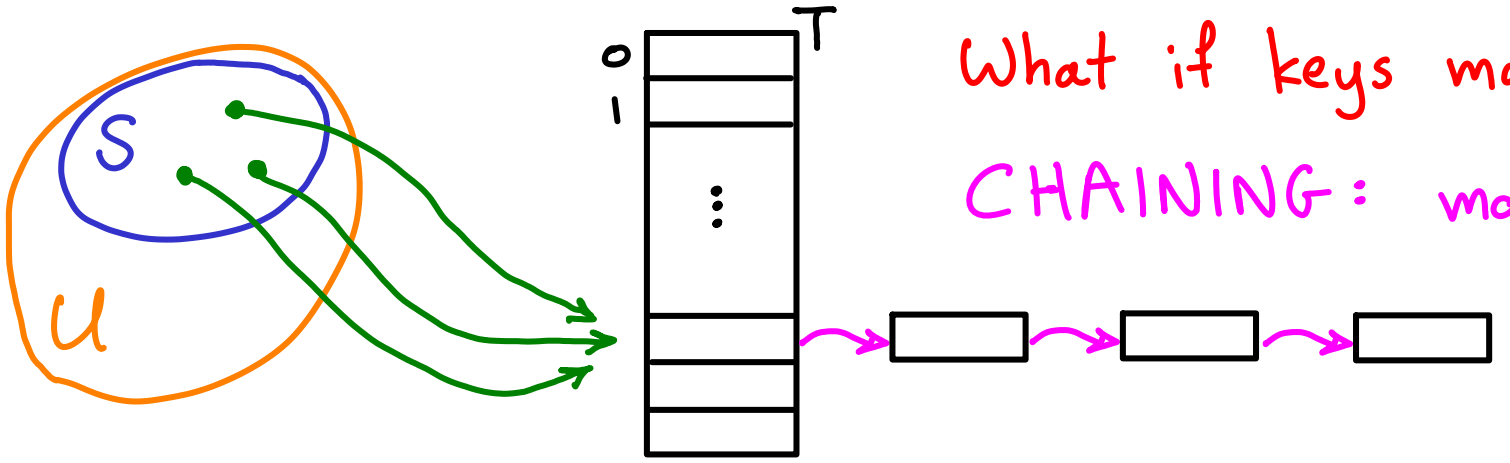


What if keys map to the same slot?

CHAINING: make a linked list

Insert: $\Theta(1)$

Search/Delete: $O(n)$

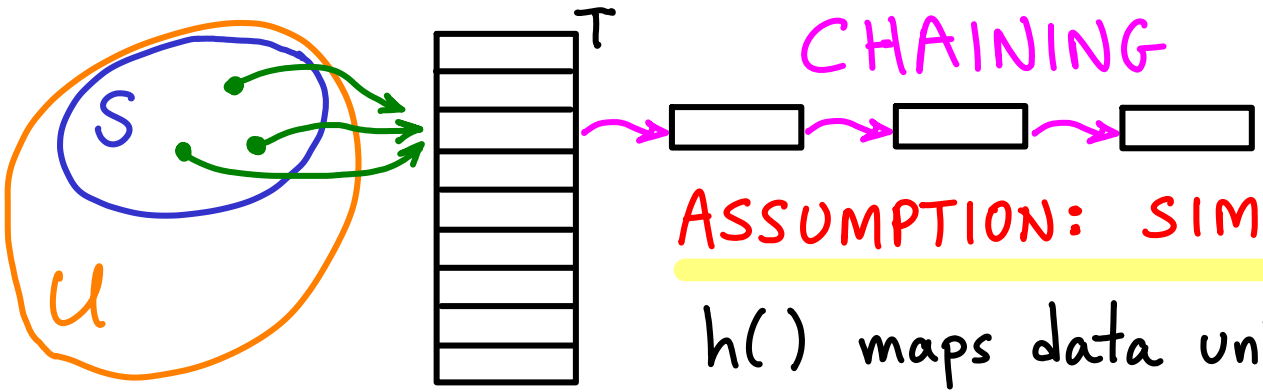
$|S| = n$

If we could spread S into T uniformly,

we would minimize max chain size (minimize worst-case time)

A random h() would do that but

we need h() to be consistent/deterministic (same key → same slot)



CHAINING

ASSUMPTION: SIMPLE UNIFORM HASHING

h( ) maps data uniformly like a random function

… even though h( ) is consistent / deterministic

Probability two given keys collide: $\frac{1}{m}$

Expected list size $= \frac{n}{m} = \alpha$ = "load factor"

Expected time of search (and delete)

1) Map to T : assume $\Theta(1)$ to evaluate h( ).

2) Scan list (on average, half a list) $\Theta(\alpha)$

$\Theta(1+\alpha)$

great if $\alpha = O(1)$