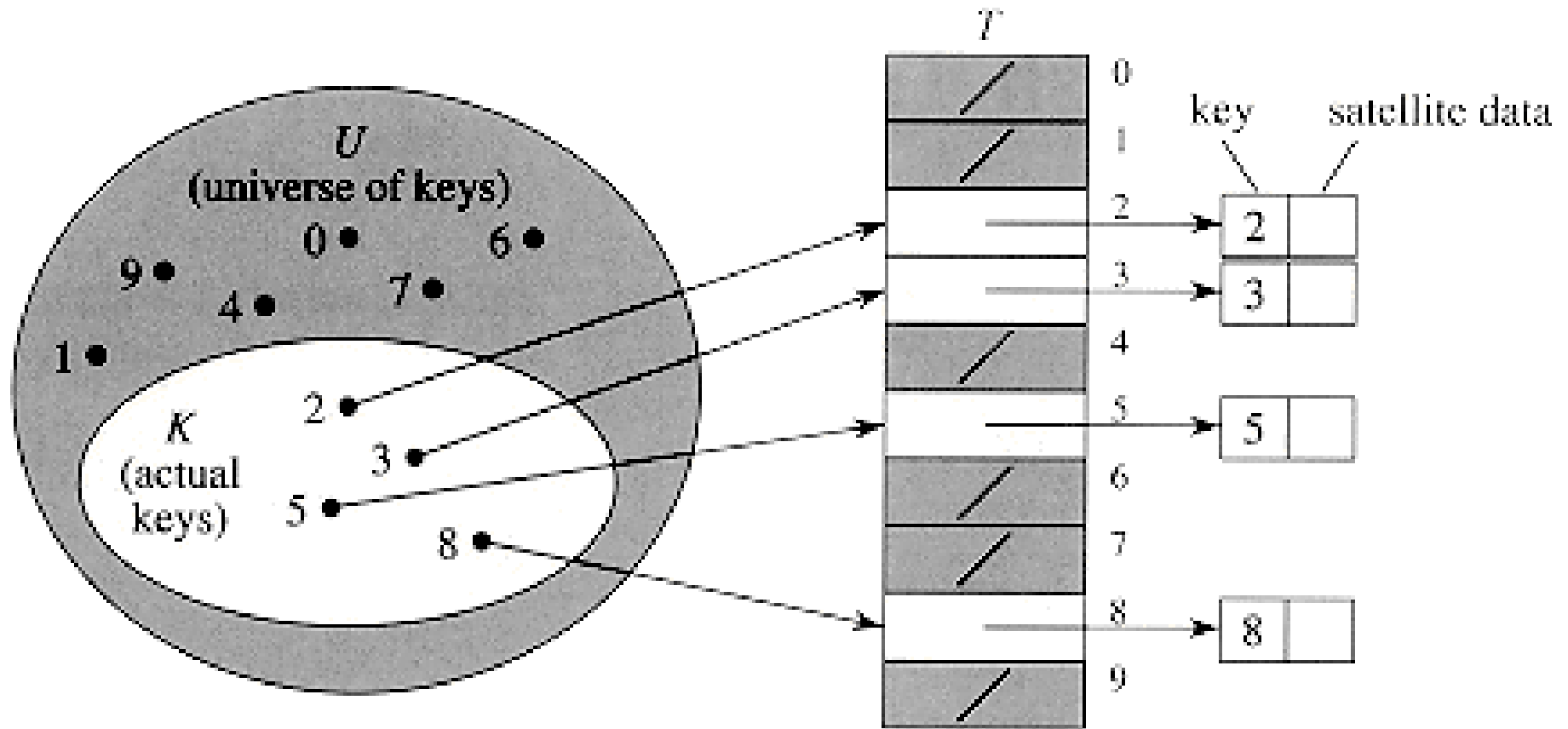# Direct address table

Direct address table

idea:

- allocate an array that has one position for every possible key

applicable: *when we can afford to …*
   the universe U of keys is reasonably small

   – each element has a key
   – drawn from the universe $U = \{0,1, . . . , m - 1\}$, where m is not too large.
   – no two elements have the same key.

Possible ways to store elements:

1. satellite data - object external to the direct-address table
   with a pointer from a slot in the table to the object
2. the elements can be stored in the direct-address table itself.

Hash table
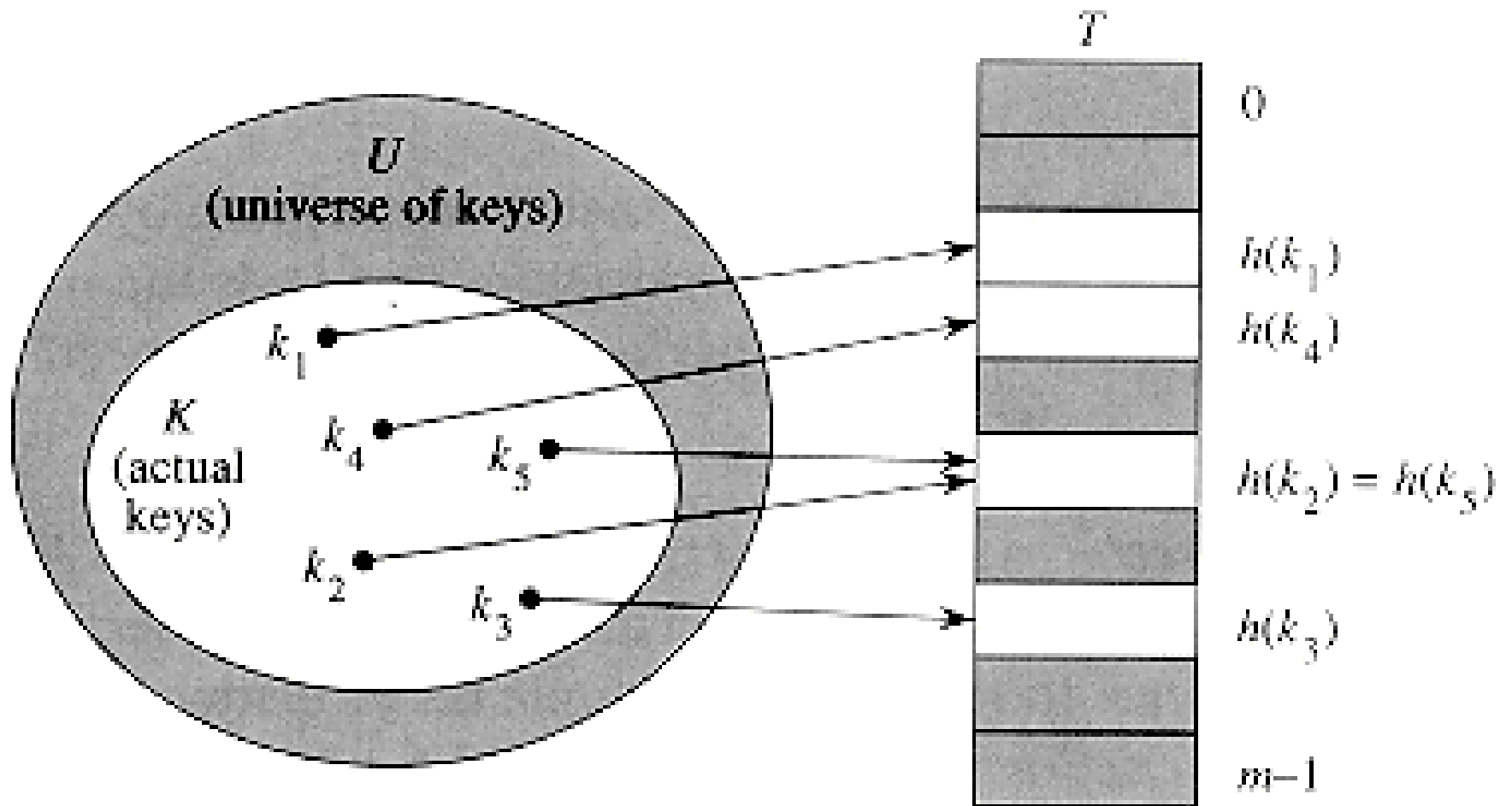
Collision problem

- ideal solution - avoid collisions

a well-designed hash function
- minimize collisions
- deterministic:
  a given input *k* should always produce the same output *h(k)*

If $|U| > m$
- there must be two keys that have the same hash value
- avoiding collisions altogether is therefore impossible
  (sometimes?)

Collision resolution by chaining