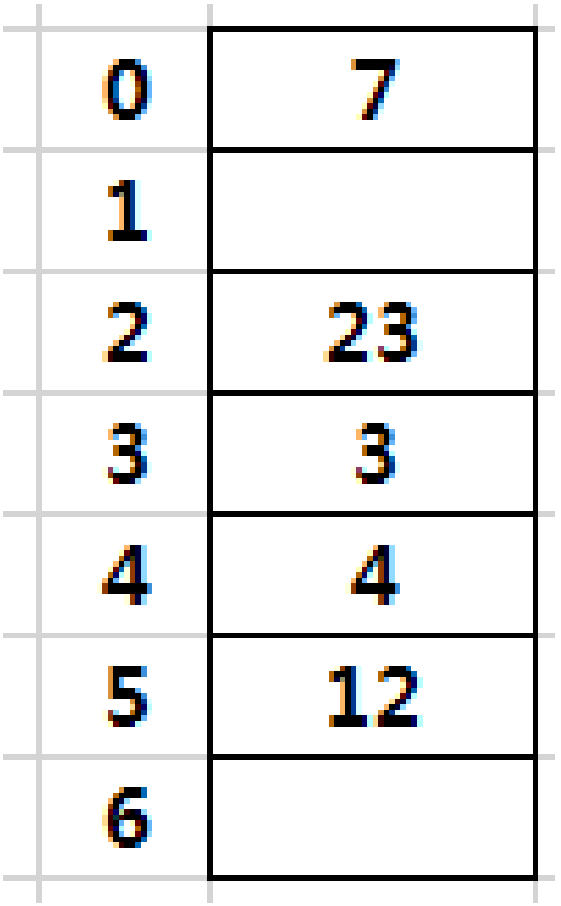
Chap 8. Hashing

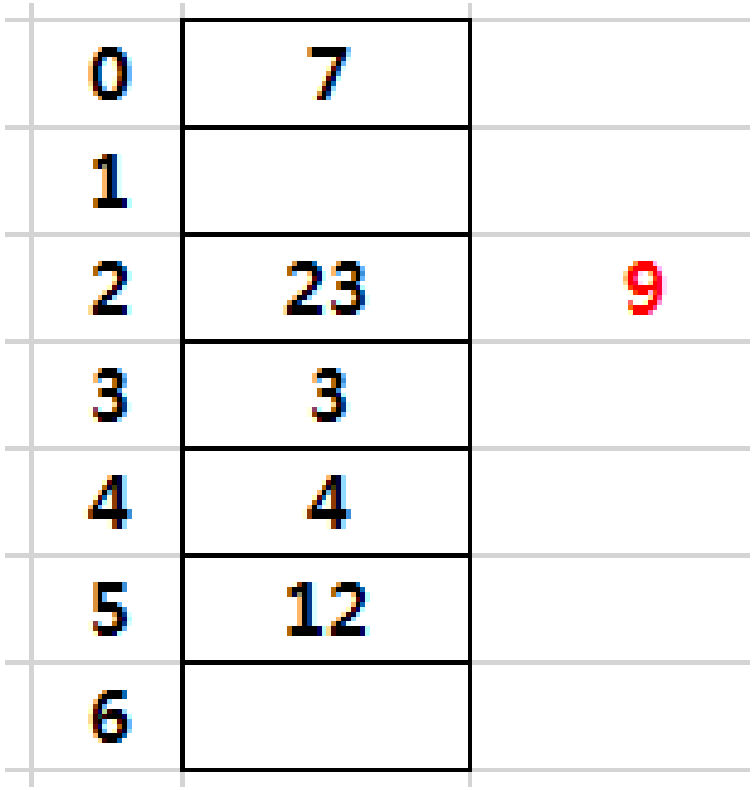
Hashing

- Key to address transformation으로 data 저장 및 검색
- Example
  - Keys of data: 12, 4, 23, 7, 3
  - Hash function: H(K) = K mod 7
- Terminologies
  - Hash table
  - Bucket
  - Hash address, bucket address
- Time complexity of key search
  - O(1) // ideal case



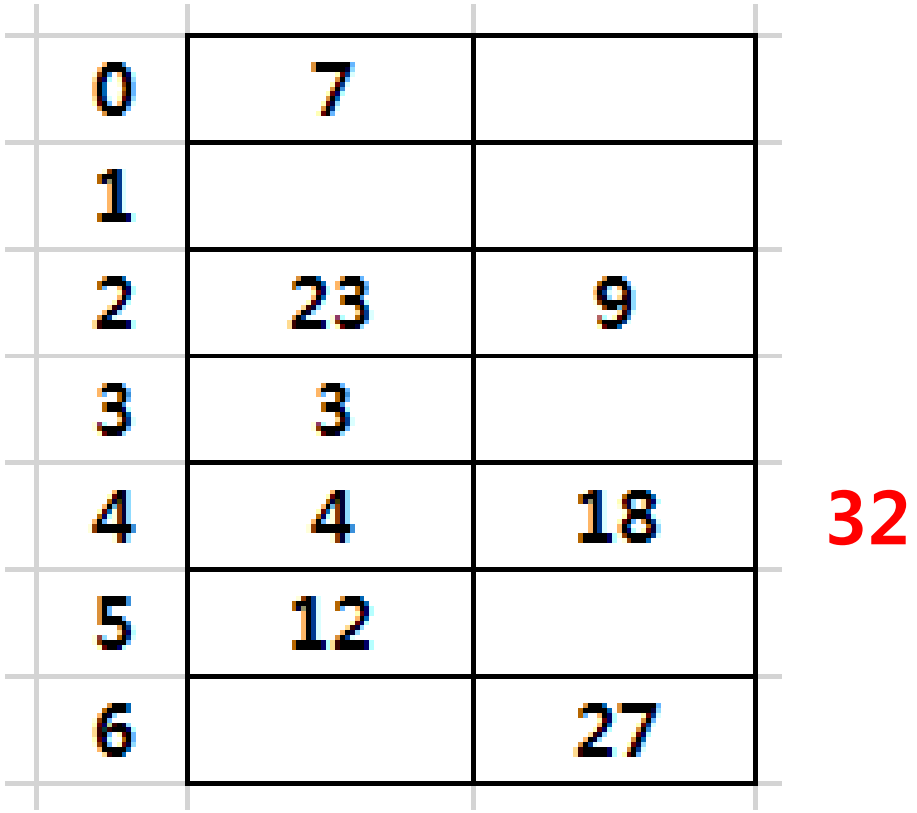
Collision

- Given two different keys k_1 and k_2, $H(k_1) = H(k_2)$
- Synonym (동의어)
- Example
  - Keys of data: 12, 4, 23, 7, 3, 9
  - Hash function: H(K) = K mod 7
- Components of hashing
  - Hash function
  - Collision resolution method
- Time complexity of key search
  - *not* O(1)



Multiple data items per bucket

- Example
  - Keys of data: 12, 4, 23, 7, 3, 9, 18, 27, 32
  - Bucket size = 2
  - Hash function: H(K) = K mod 7
- Bucket size, bucket capacity
- Synonyms are stored in the same bucket
- Bucket overflow
  - Bucket overflow handling



Techniques

- Hash functions
  - Division
  - Mid-sqaure
  - Folding
  - Digit analysis
  - etc.
- Collision resolution (or bucket overflow handling)
  - Open addressing
    - Linear probing
    - etc.
  - Chaining

0	7
1	
2	23
3	3
4	4
5	12
6	9

0	7	
1		
2	23	9
3	3	
4	4	18
5	12	32
6		27