Extendible Hashing Example
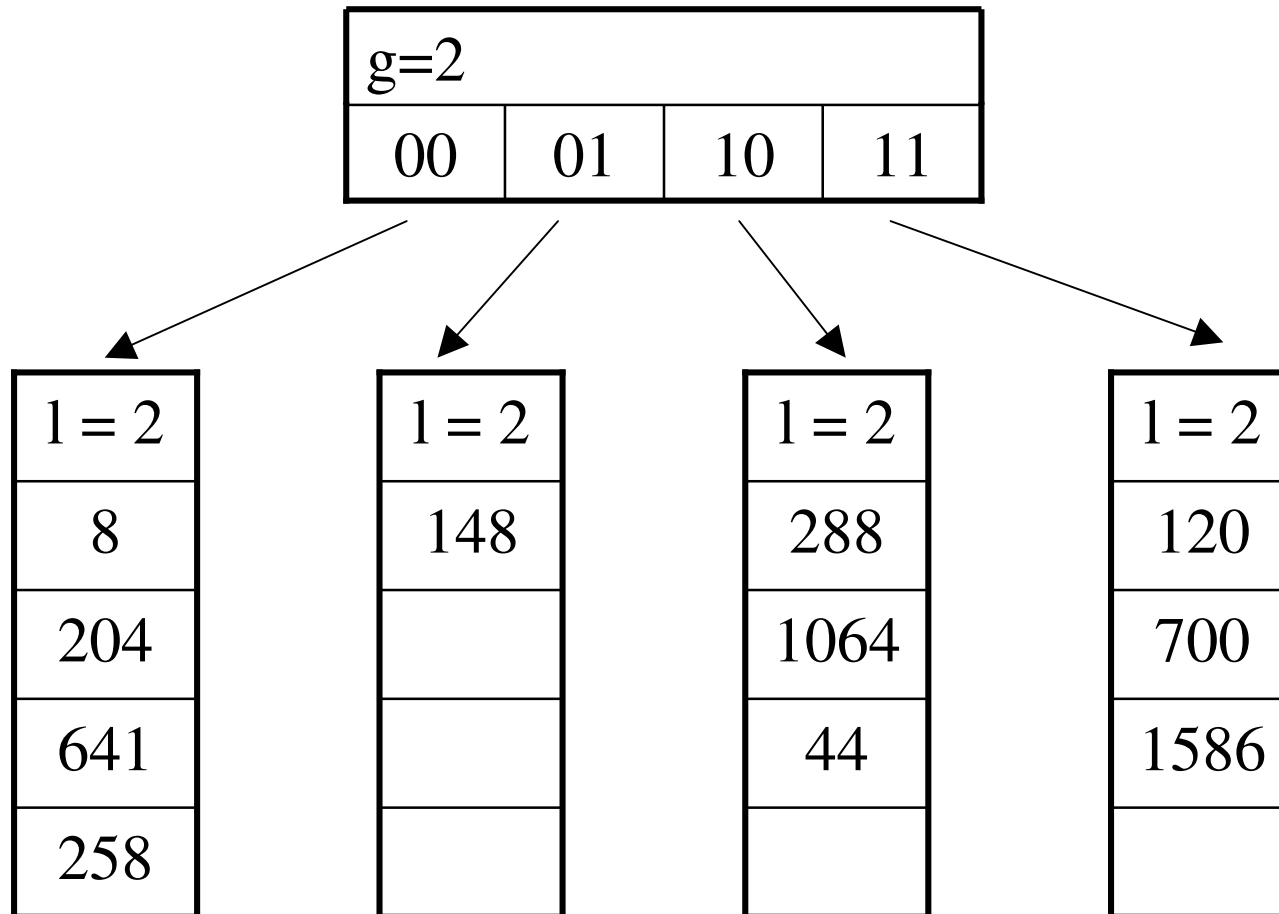
- Suppose that g=2 and bucket size = 4.
- Suppose that we have records with these keys and hash function h(key) = key mod 64:

key	h(key) = key mod 64	bit pattern
288	32	100000
8	8	001000
1064	40	101000
120	56	111000
148	20	010100
204	12	001100
641	1	000001
700	60	111100
258	2	000010
1586	50	110010
44	44	101010

Extendible Hashing Example – directory and bucket structure

g=2			
00	01	10	11

l = 2
8
204
641
258

l = 2
148

l = 2
288
1064
44

l = 2
120
700
1586

Bucket and directory split

- Insert 68
- 68 mod 64 = 4 = 000100

g=3							
000	001	010	011	100	101	110	111

l = 3
641
258
68

l = 3
8
204

l = 2
148

l = 2
288
1064
44

l = 2
120
700
1586
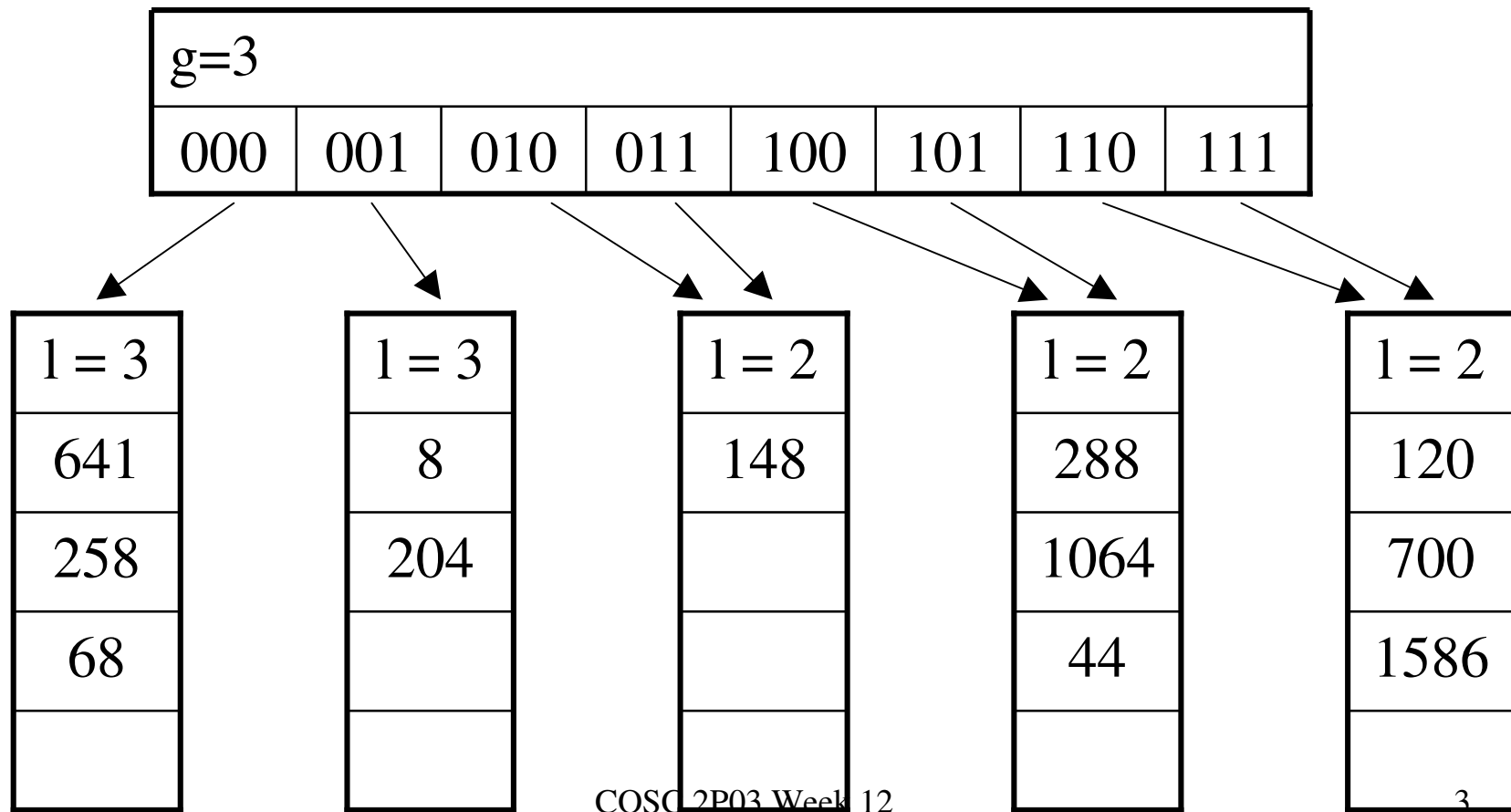
Bucket split – no directory split

- Insert 48 and 575
- 48 mod 64 = 48 = 110000
- 575 mod 64 = 63 = 111111

g=3							
000	001	010	011	100	101	110	111

l = 3
641
258
68

l = 3
8
204

l = 2
148

l = 2
288
1064
44

l = 3
1586
48

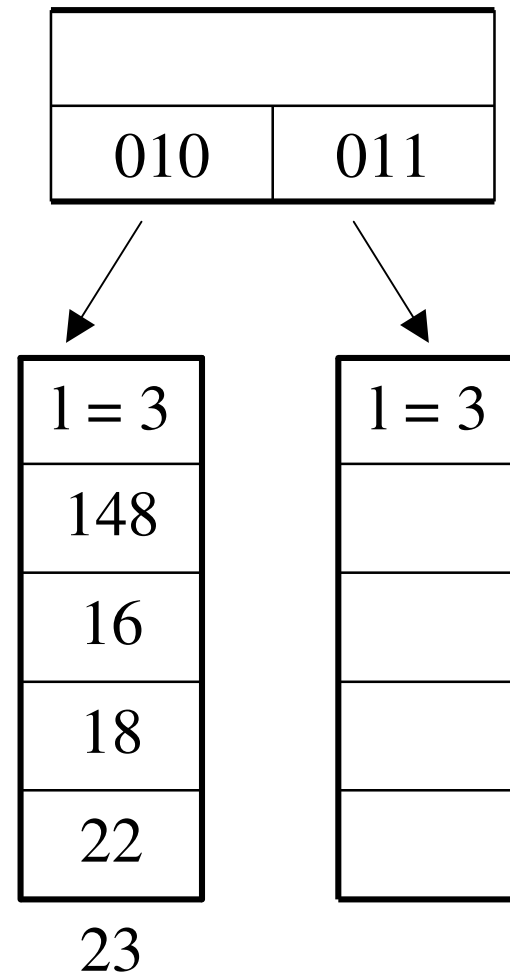| l = 3 |
|-------|
| 120 |
| 700 |
| 575 |
| |
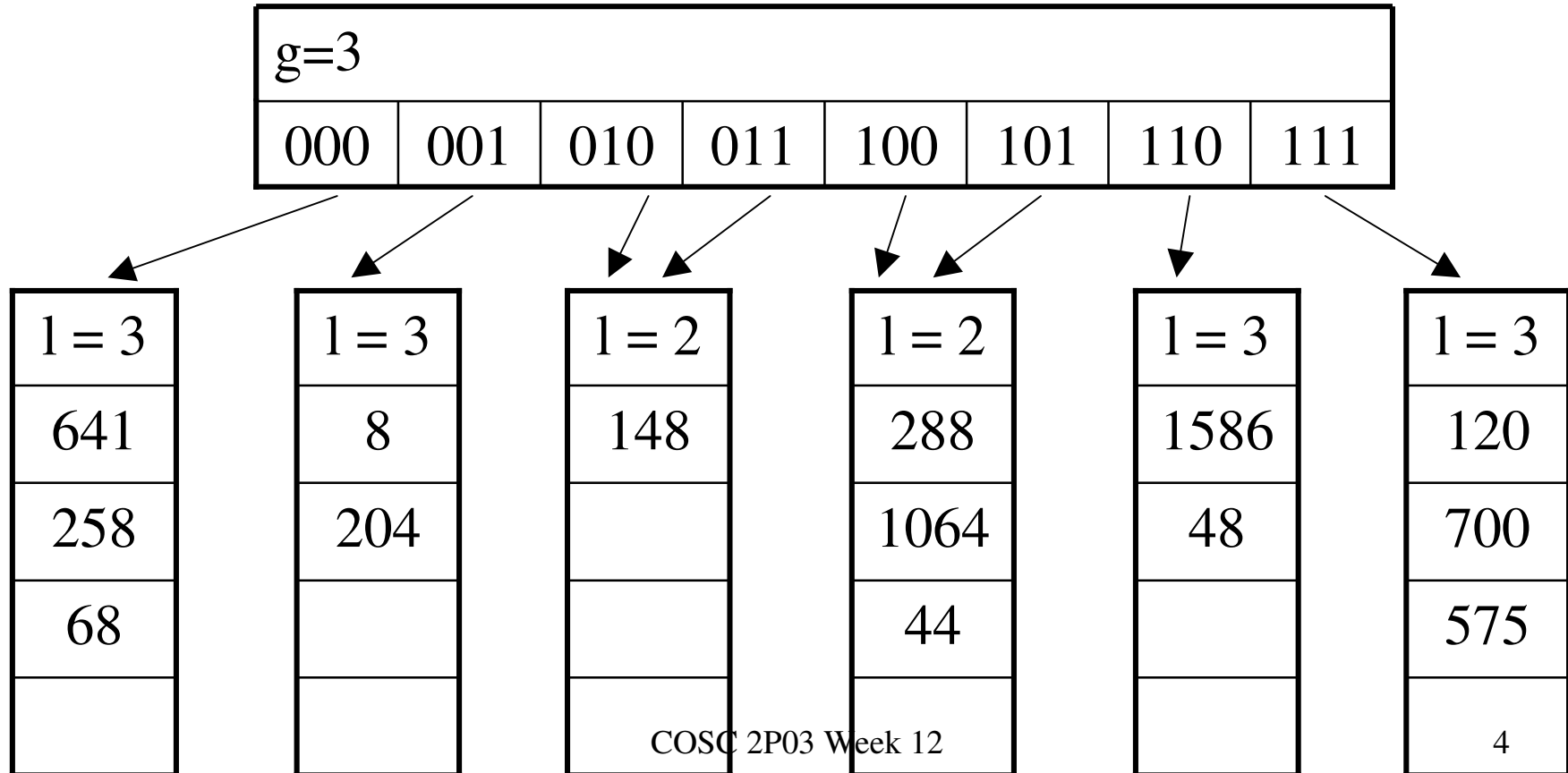
Multiple splits

- Insert 16, 18, 22, 23
- $16 \bmod 64 = 16 = 010000$
- $18 \bmod 64 = 18 = 010010$
- $22 \bmod 64 = 22 = 010110$
- $23 \bmod 64 = 23 = 010111$

Setting l=3 gives this intermediate (partial) picture…

Continue to next page…

010	011

l = 3
148
16
18
22

23

l = 3

Multiple splits, continued

- Setting l=4 (and thus g=4) gives this final result…

g=4															
0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111

l = 3	l = 3	l = 4	l = 4	l = 3	l = 2	l = 3	l = 3
641	8	16	148		288	1586	120
258	204	18	22		1064	48	700
68			23		44		575