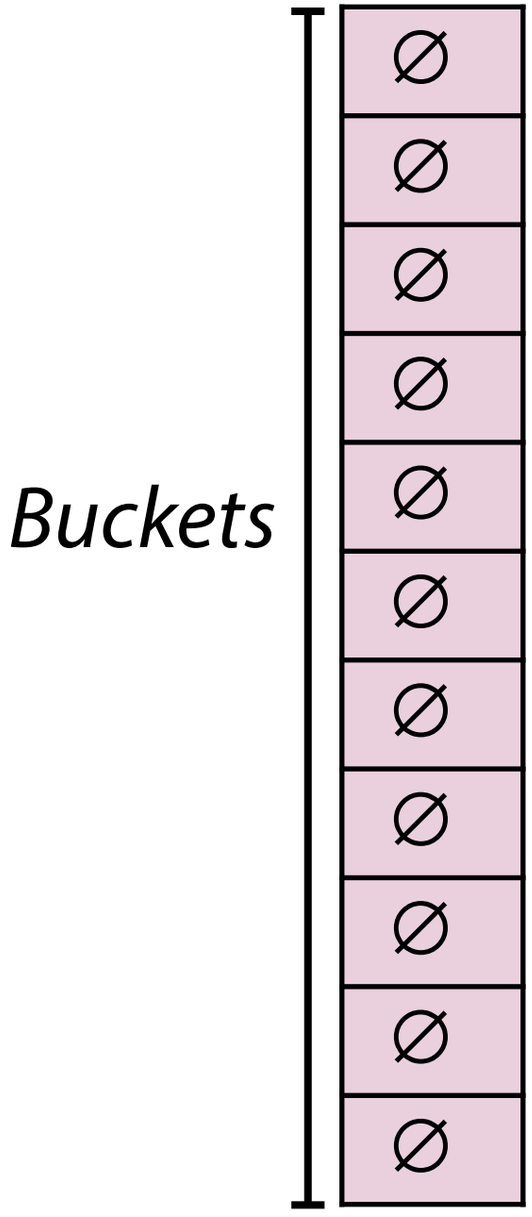
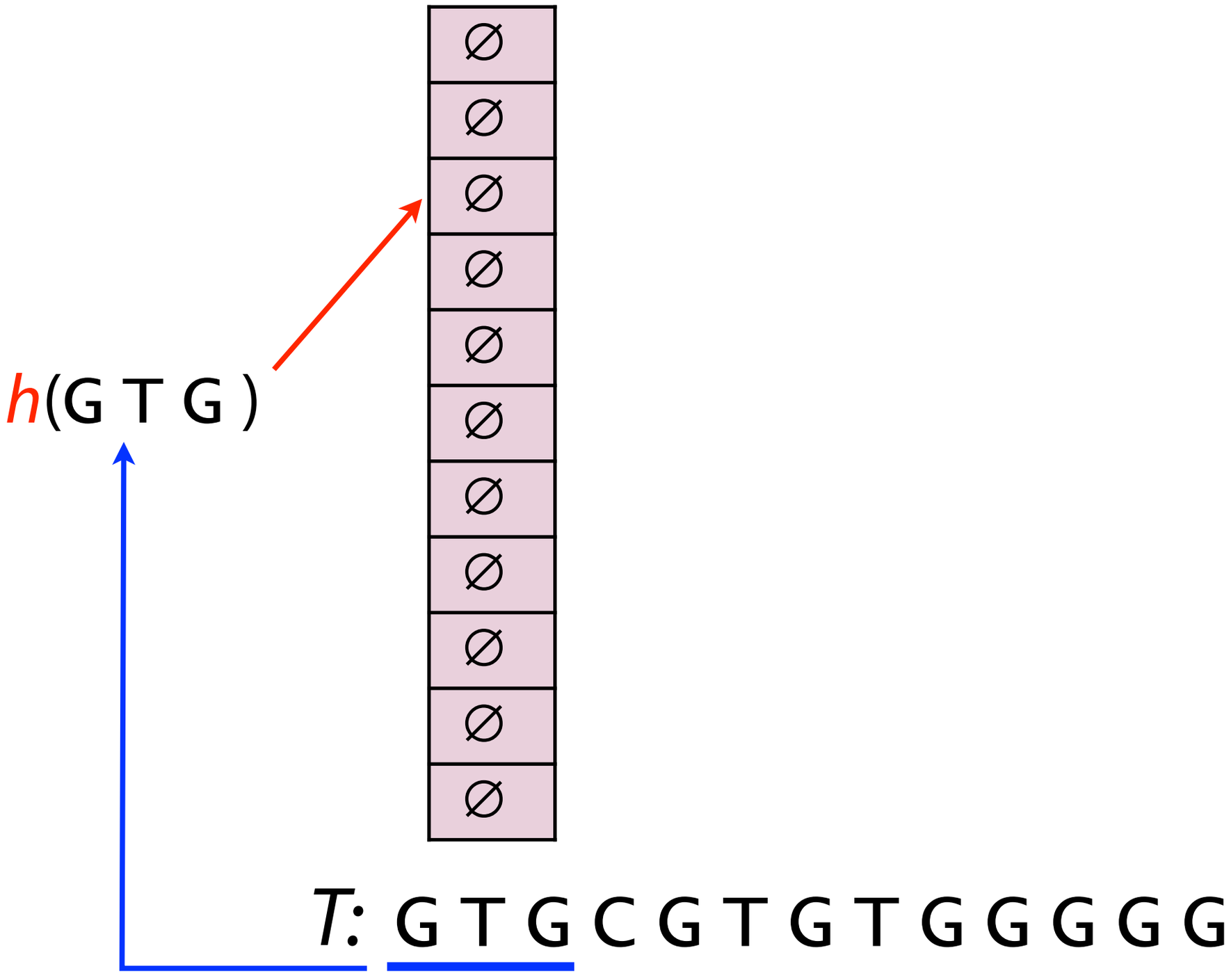
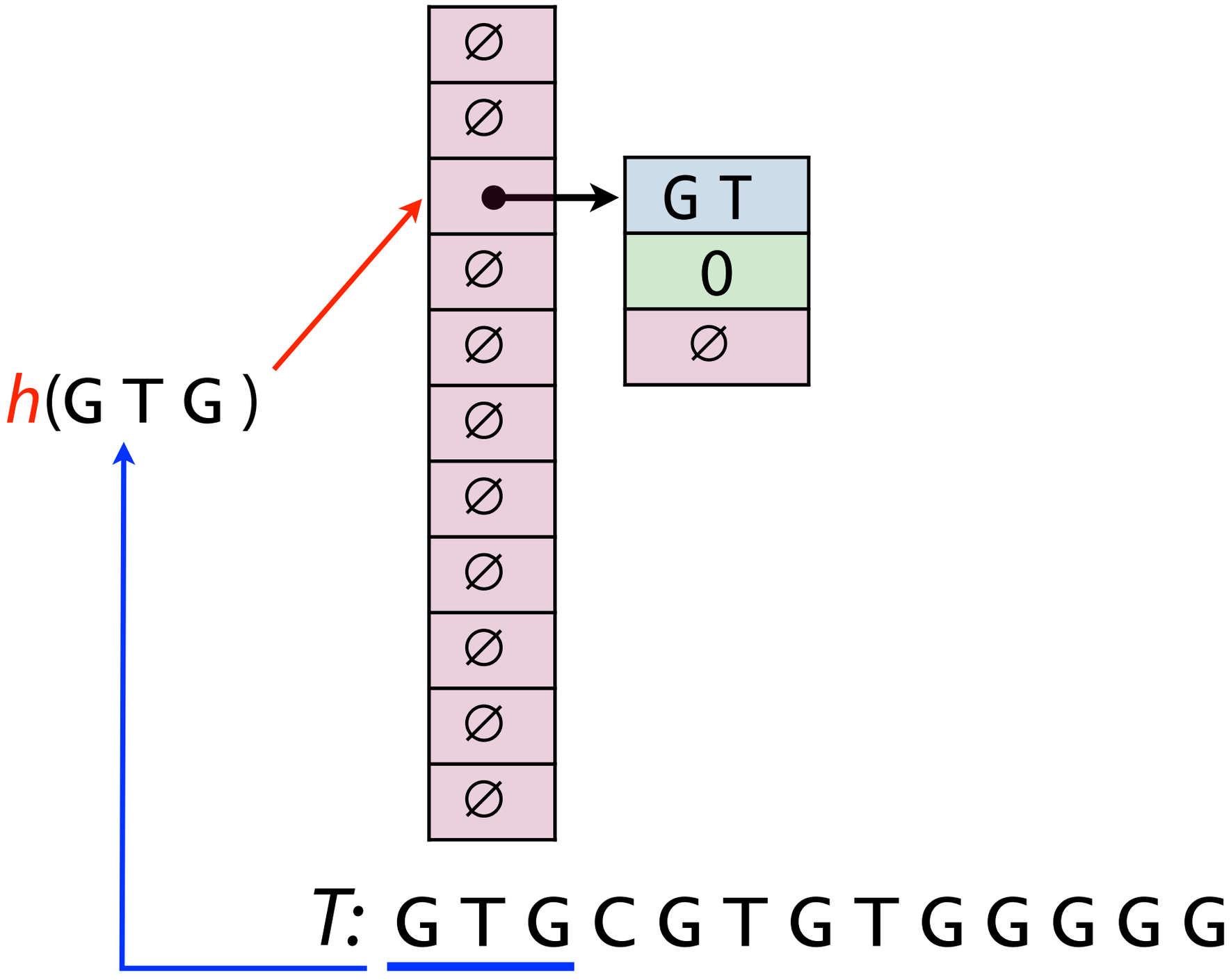
Hash table

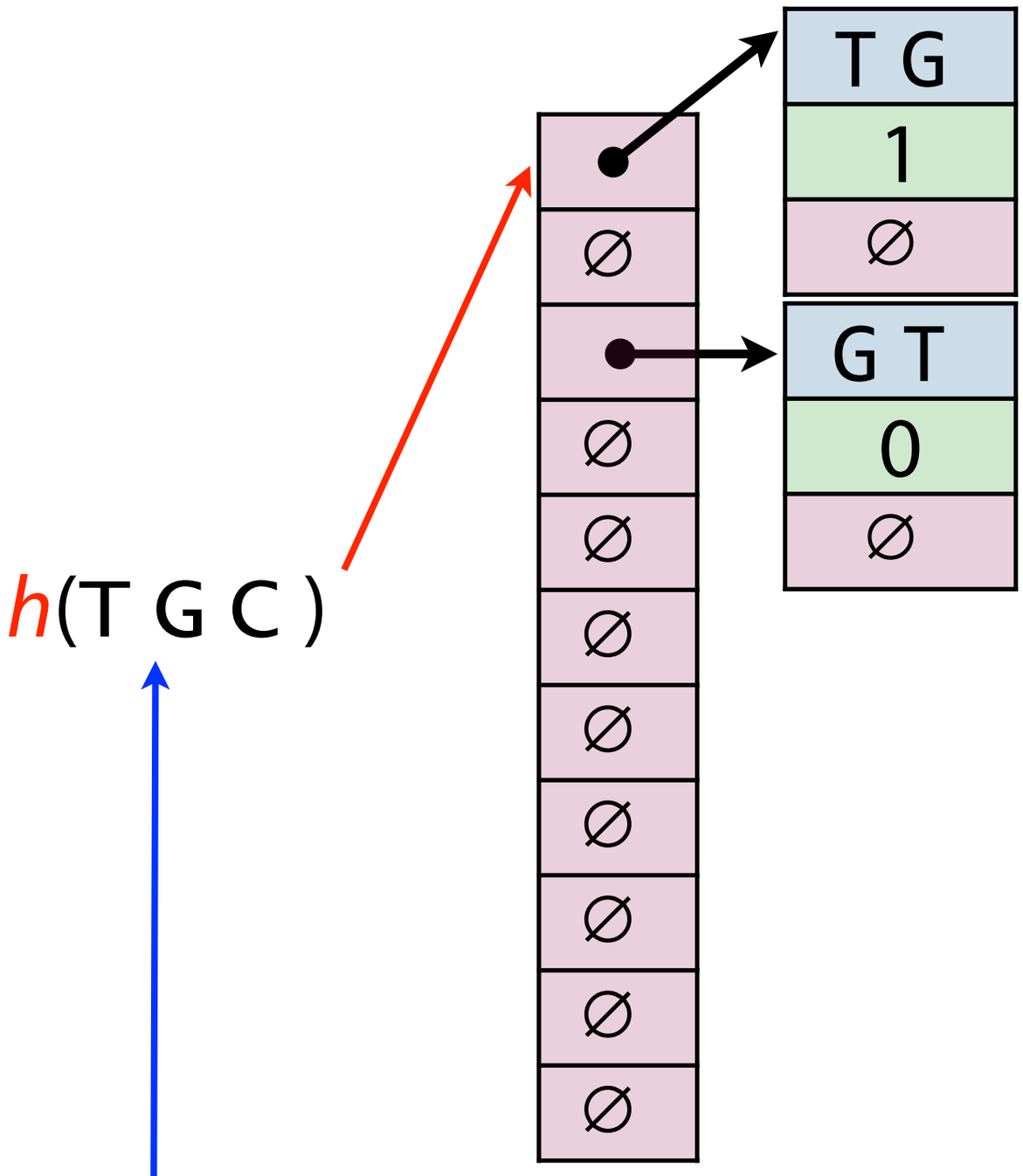


Hash function *h* maps
3-mers to buckets

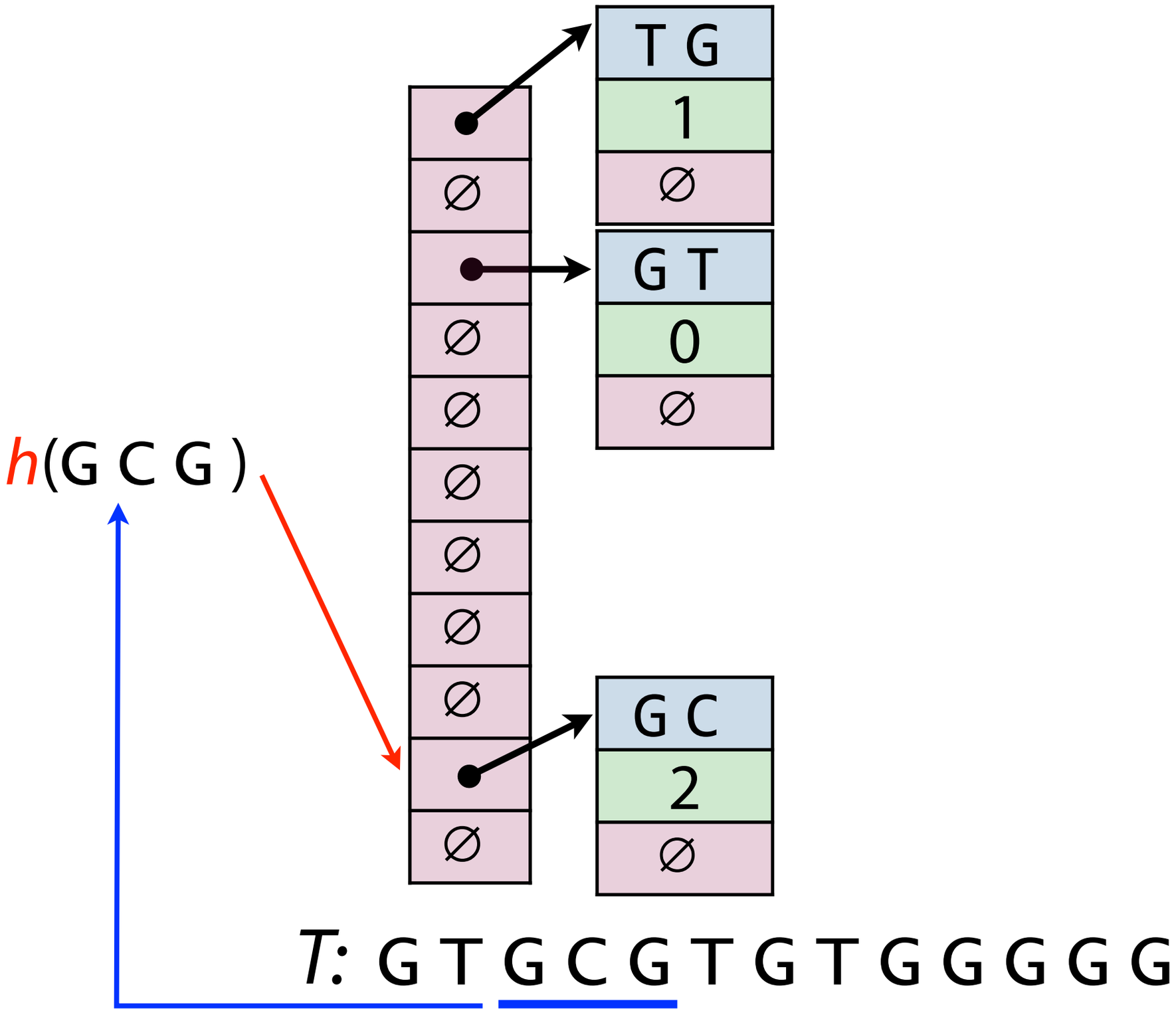
T: G T G C G T G T G G G G

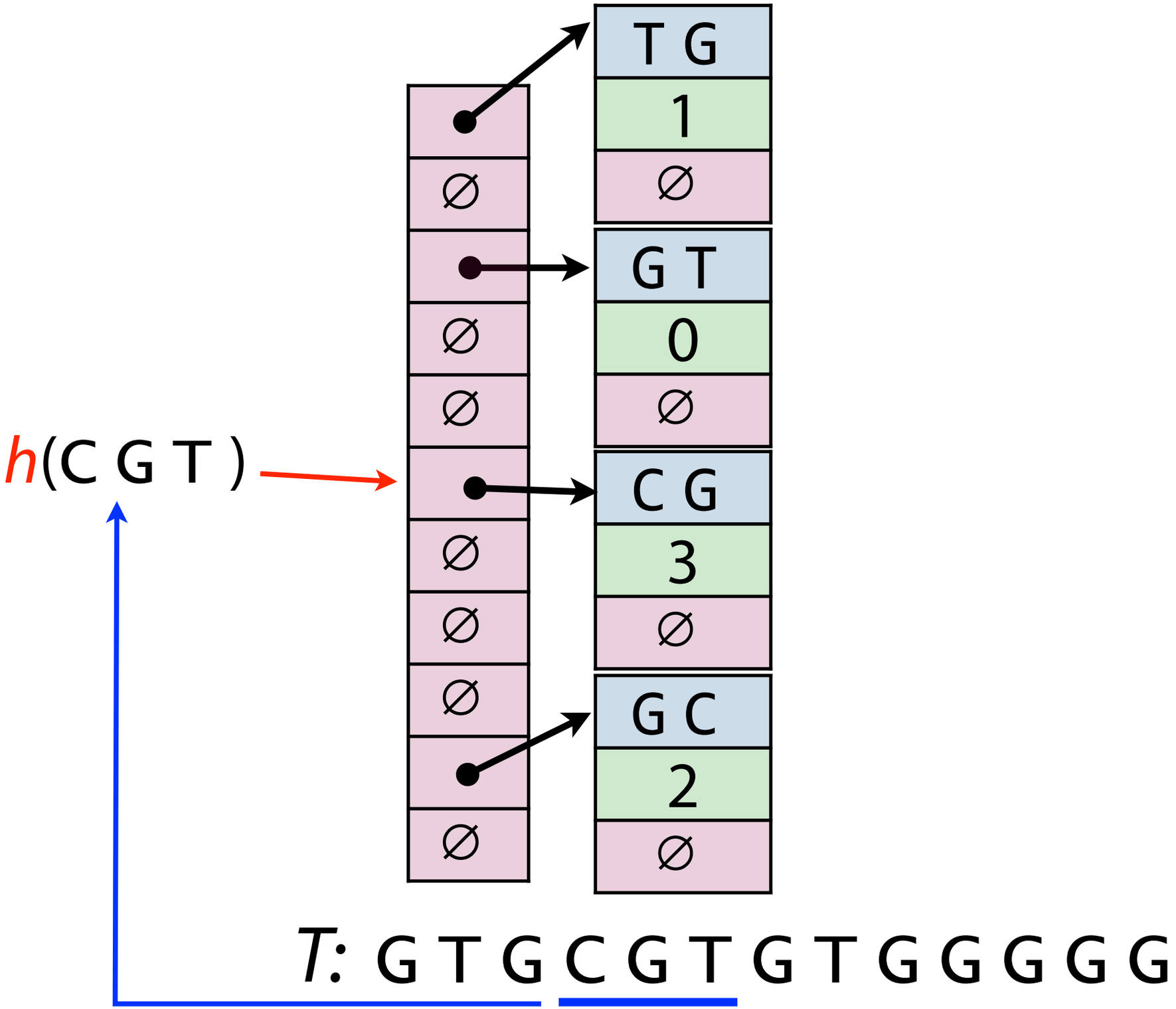

h(G T G)
∅
∅
∅
∅
∅
∅
∅
∅
∅
∅
∅
∅
T: G T G C G T G T G G G G

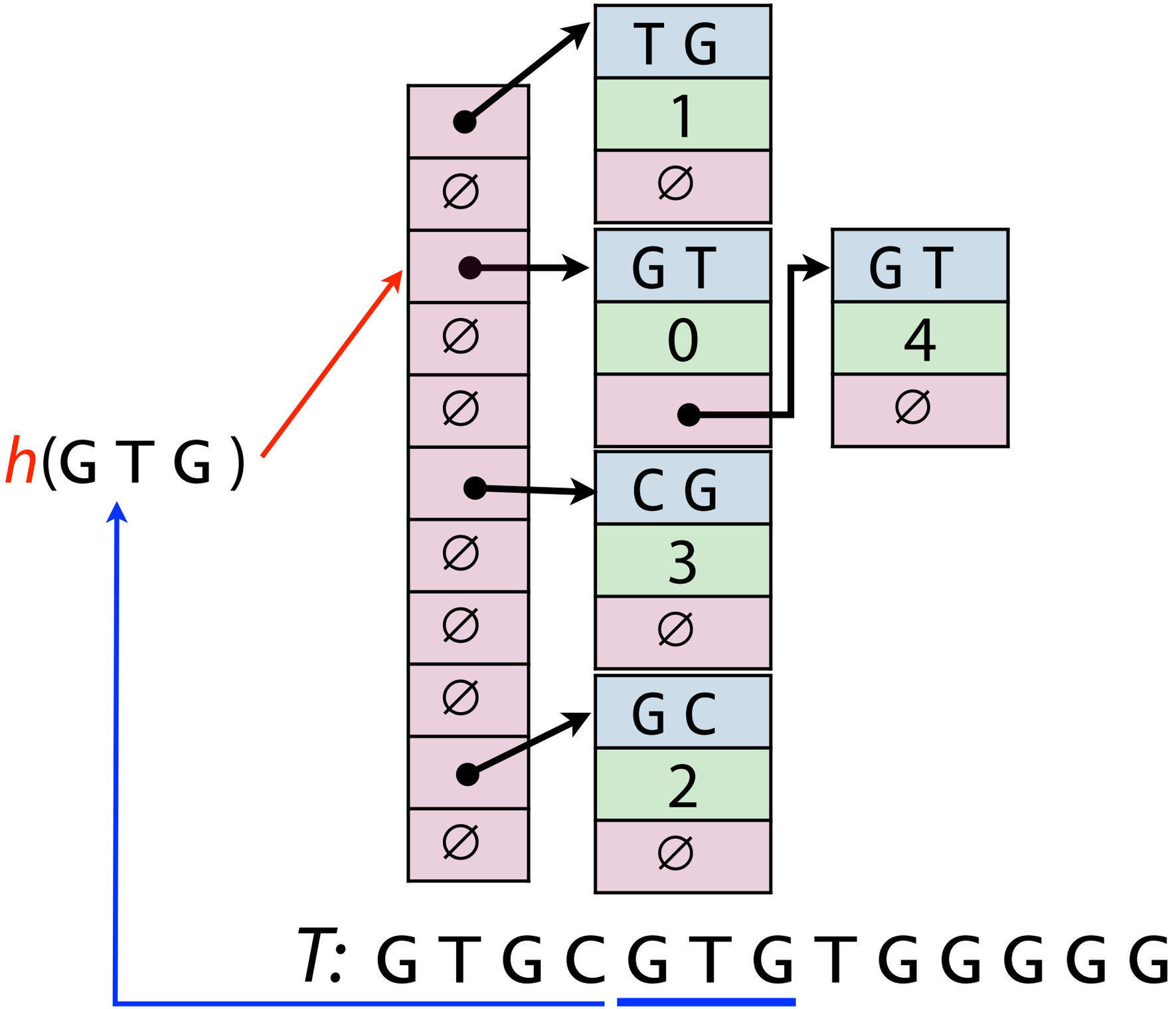

∅
∅
G T
0
∅
∅
∅
∅
∅
∅
∅
∅
∅
h(G T G)
T: G T G C G T G T G G G G

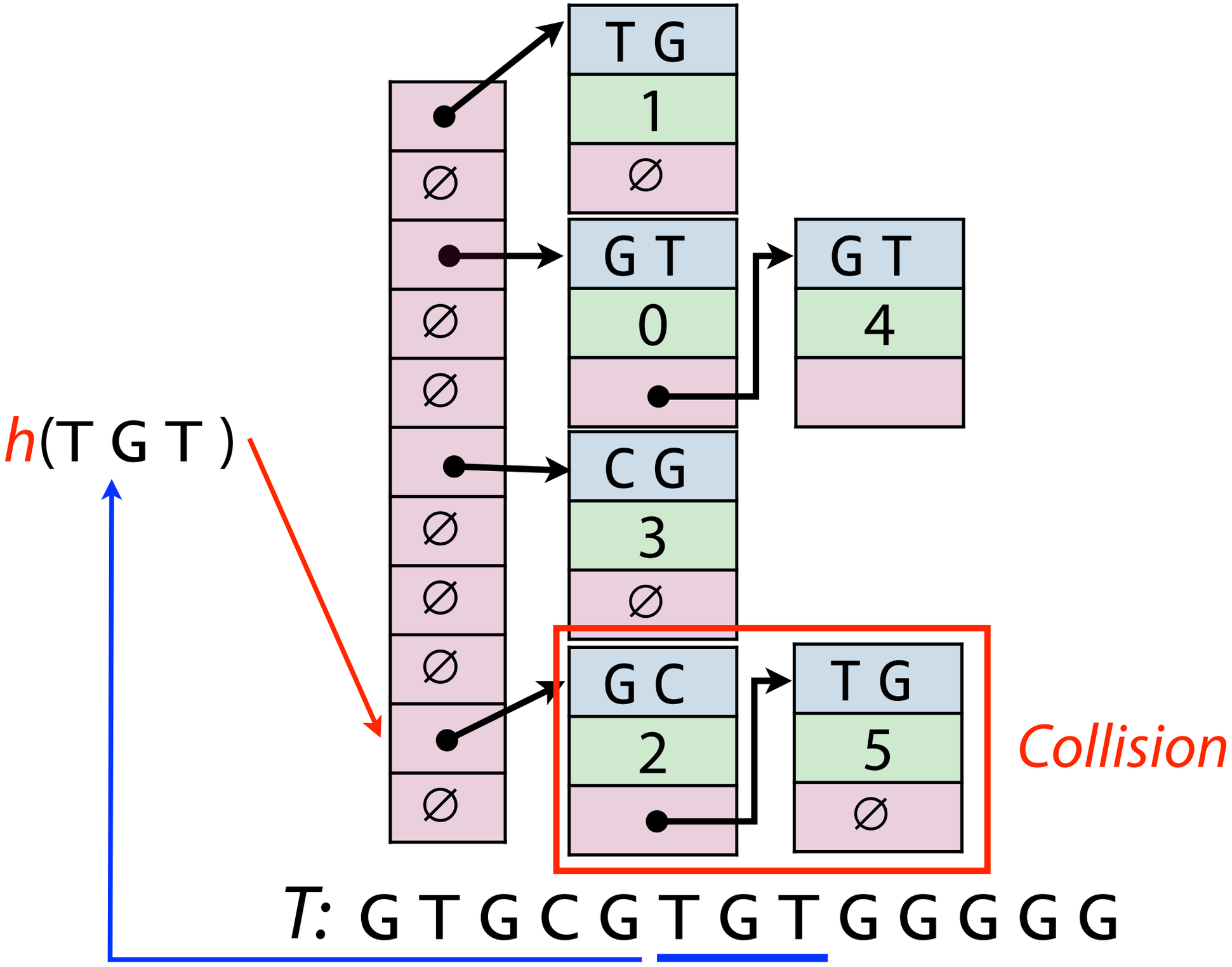


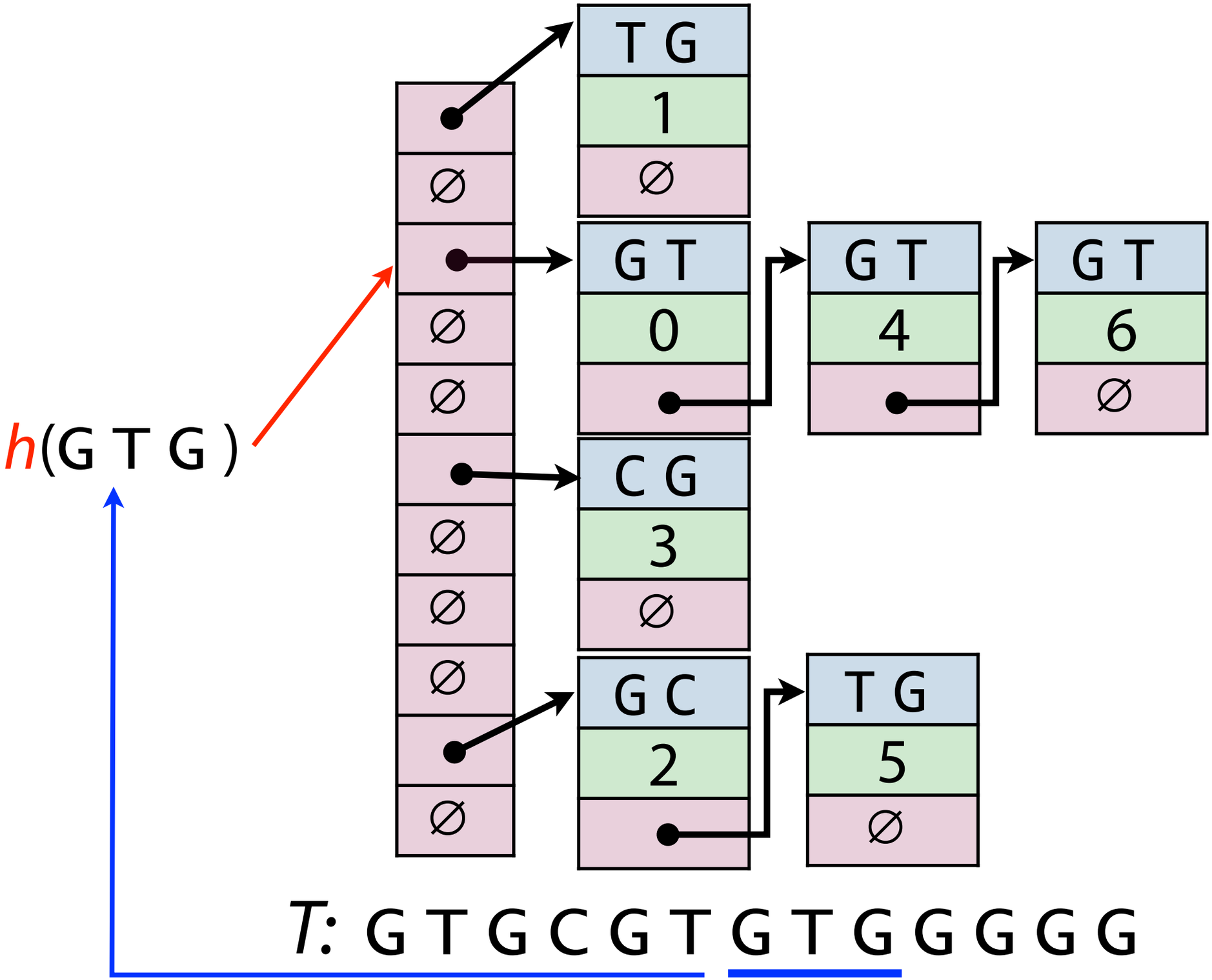
T: G T G C G T G T G G G G

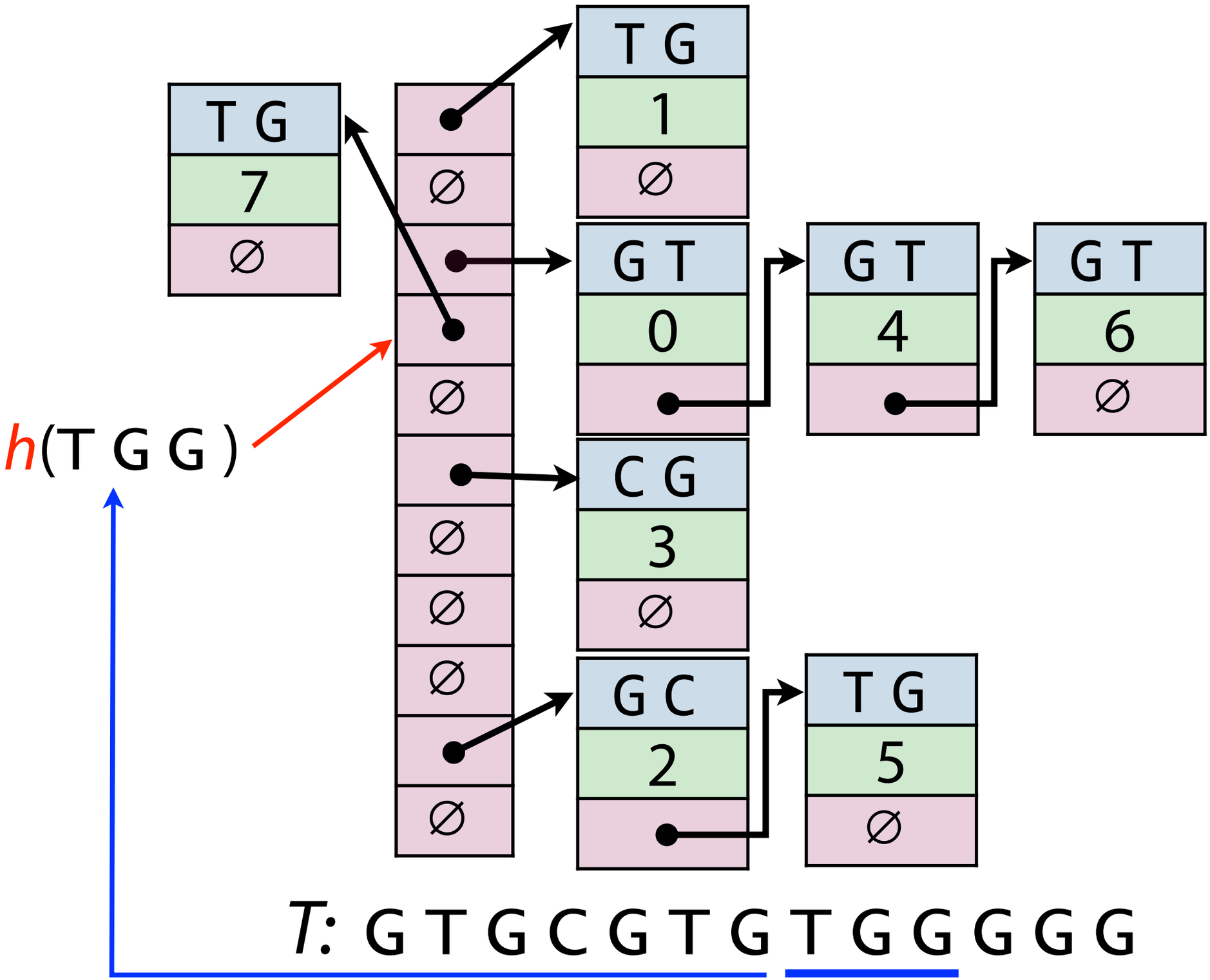

h(G C G)
T G
1
∅
G T
0
∅
G C
2
∅
T: G T G C G T G T G G G G G

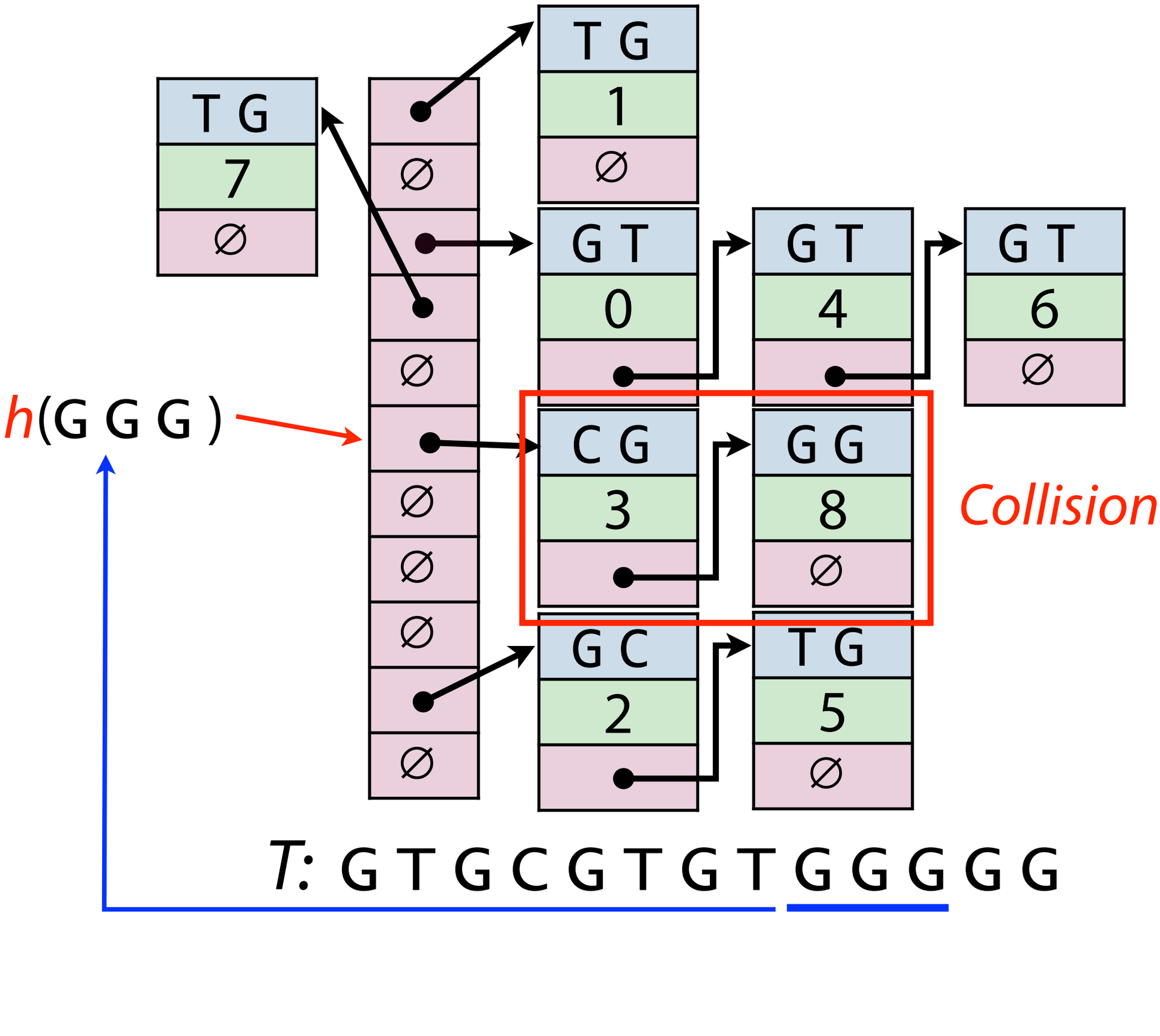

T G
1
∅
G T
0
∅
C G
3
∅
G C
2
∅
∅
∅
∅
∅
∅
∅
∅
∅
h(C G T)
T: G T G C G T G T G G G G G

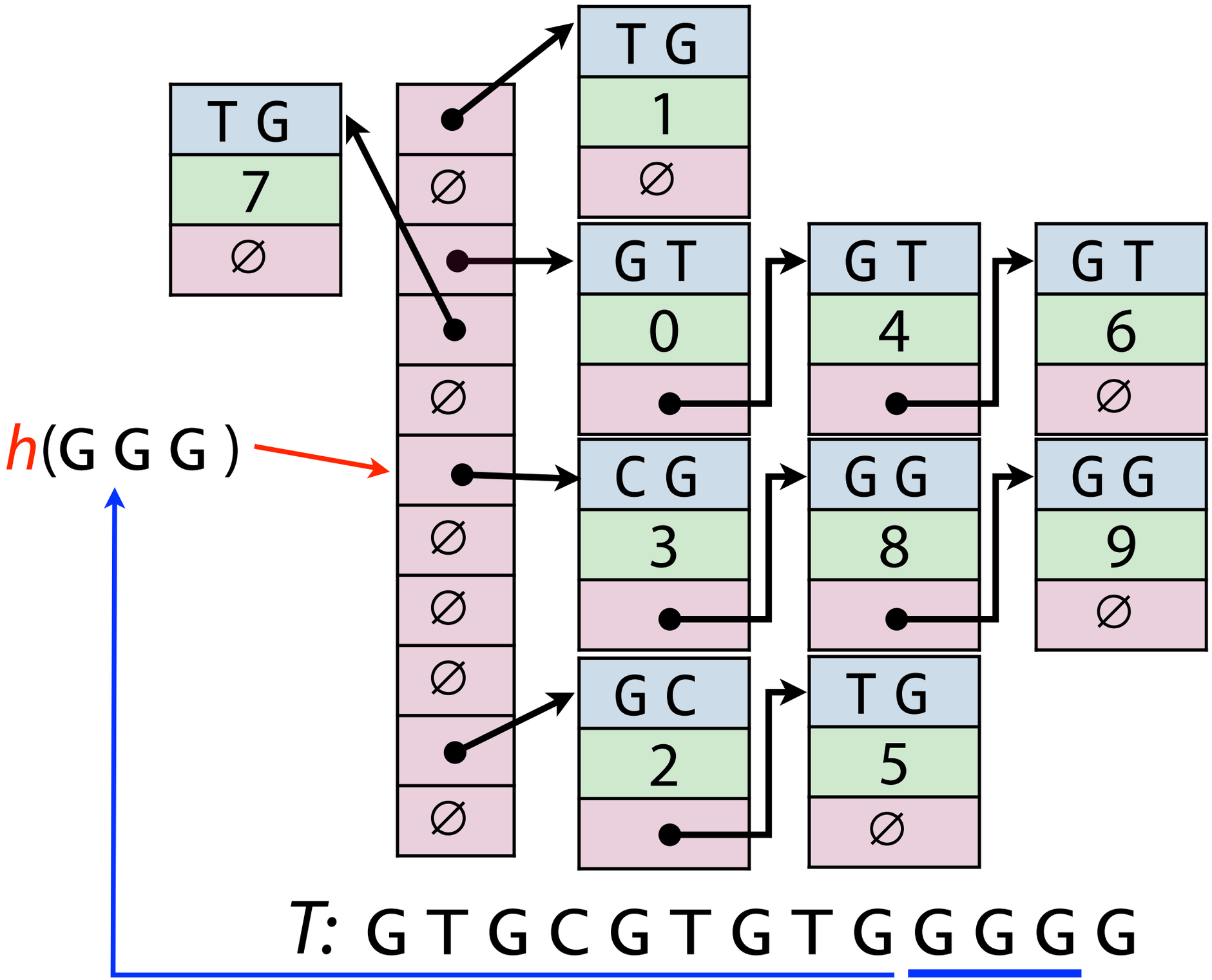

T G
1
∅
G T
0
G T
4
∅
C G
3
∅
G C
2
∅
h(G T G)
T: G T G C G T G T G G G G G

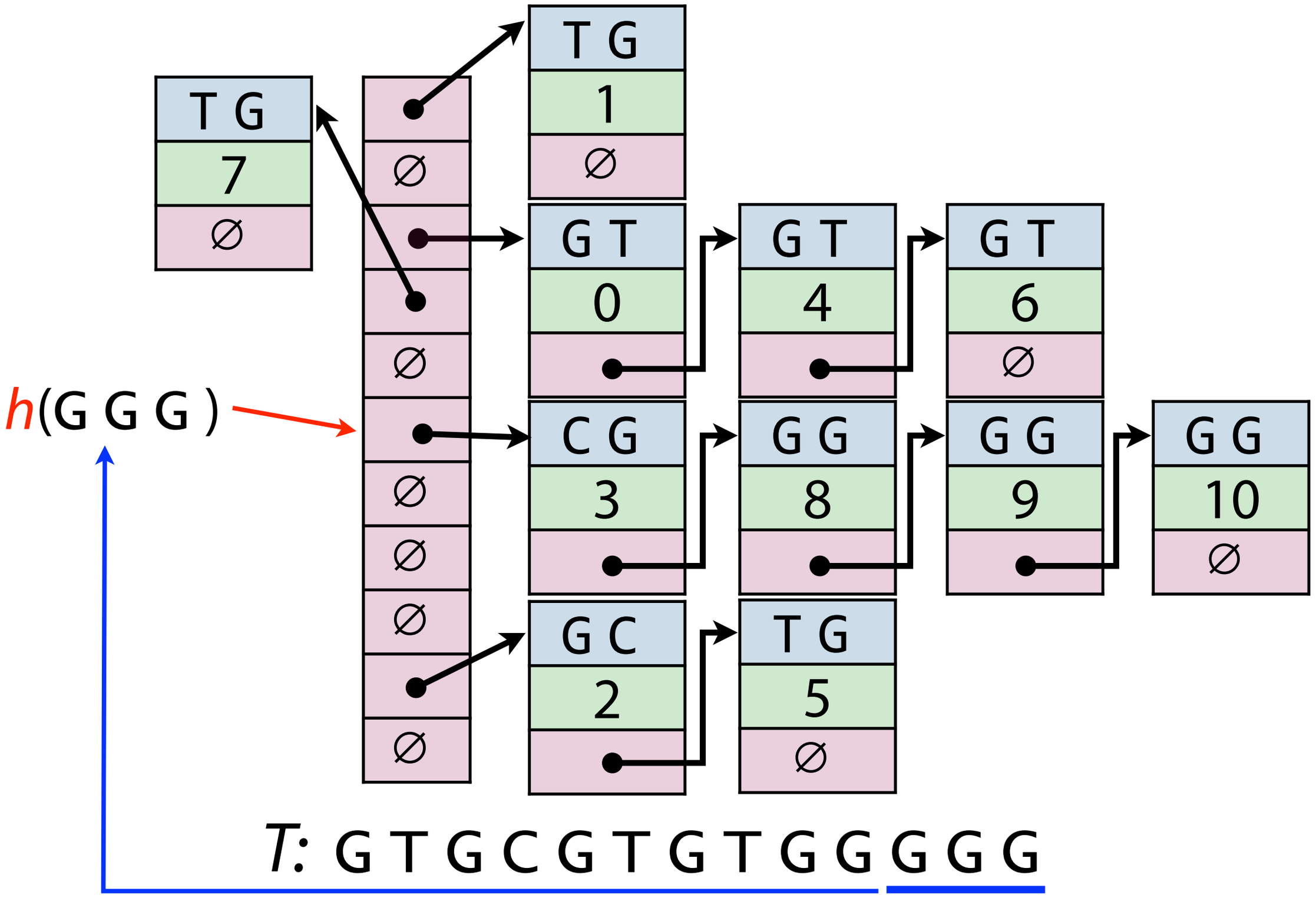

h(T G T)
T G
1
∅
G T
0
G T
4
C G
3
G C
2
T G
5
Collision
T: G T G C G T G T G G G G G

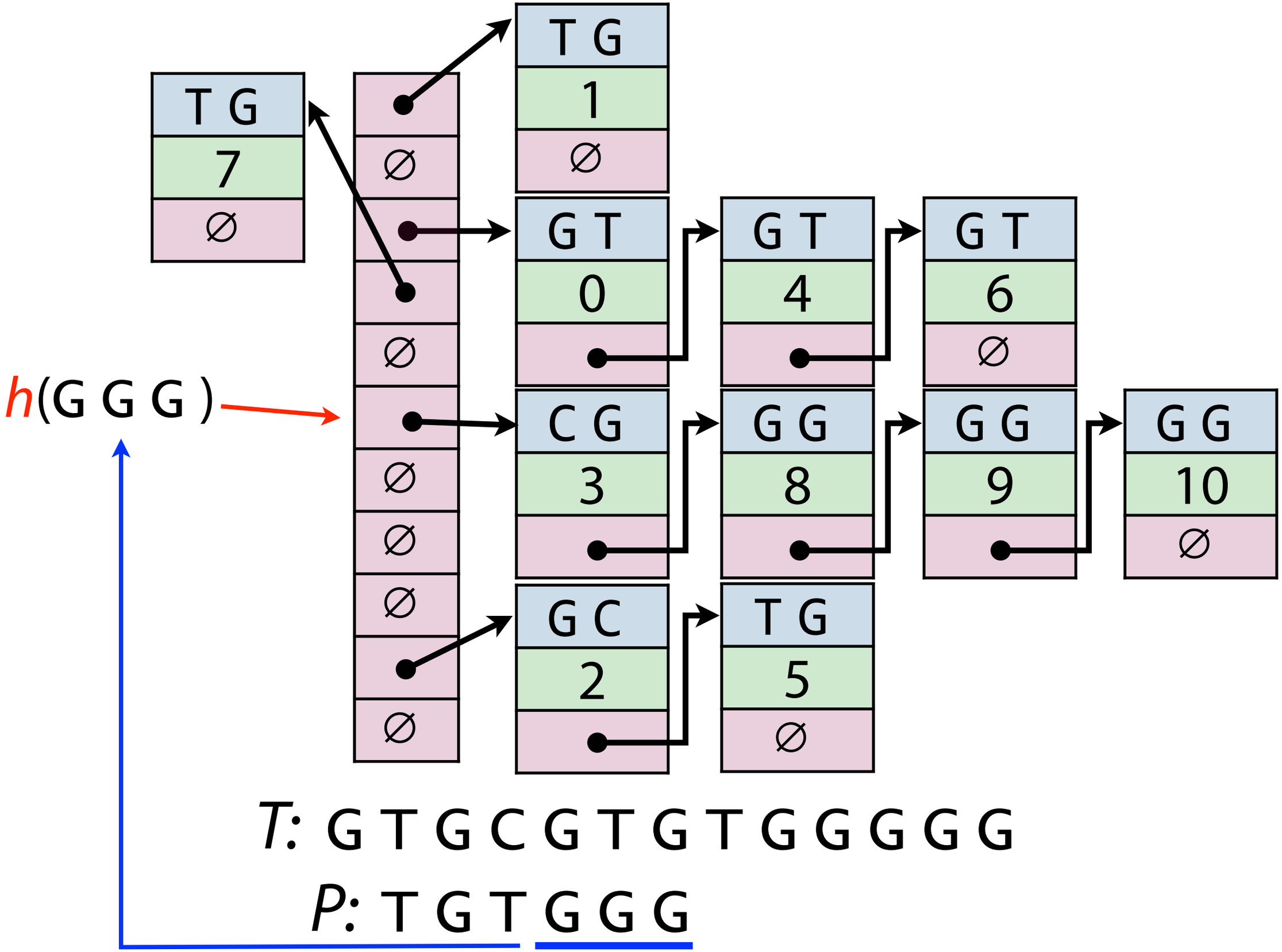

h(G T G)
T G
1
∅
G T
0
G T
4
G T
6
∅
C G
3
∅
G C
2
T G
5
∅
∅
∅
∅
∅
∅
∅
∅
T: G T G C G T G T G G G G G

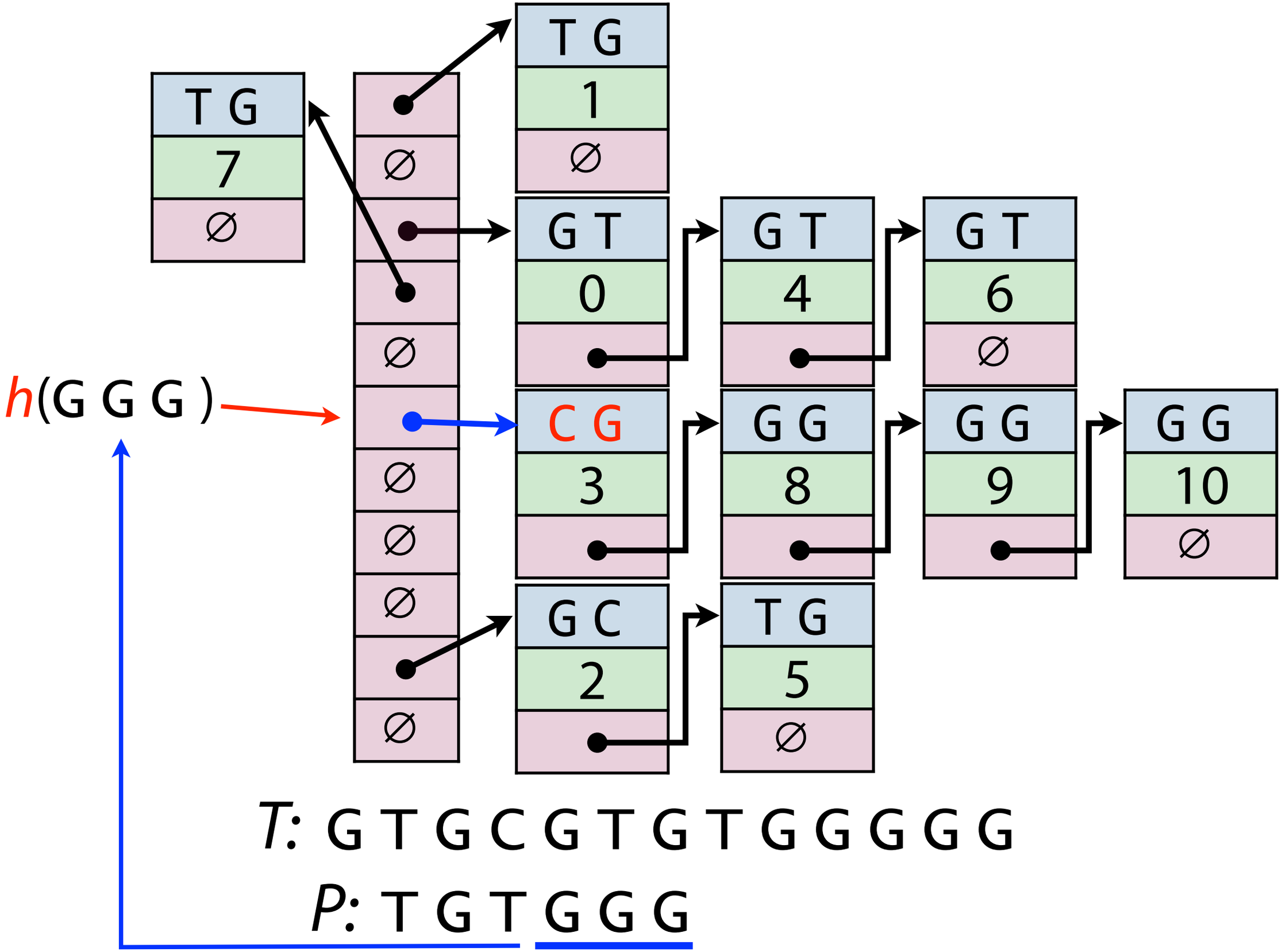

T G
7
∅
∅
∅
∅
∅
∅
∅
∅
T G
1
∅
G T
0
C G
3
∅
G C
2
G T
4
G T
6
∅
T G
5
∅
h(T G G)
T: G T G C G T G T G G G G G

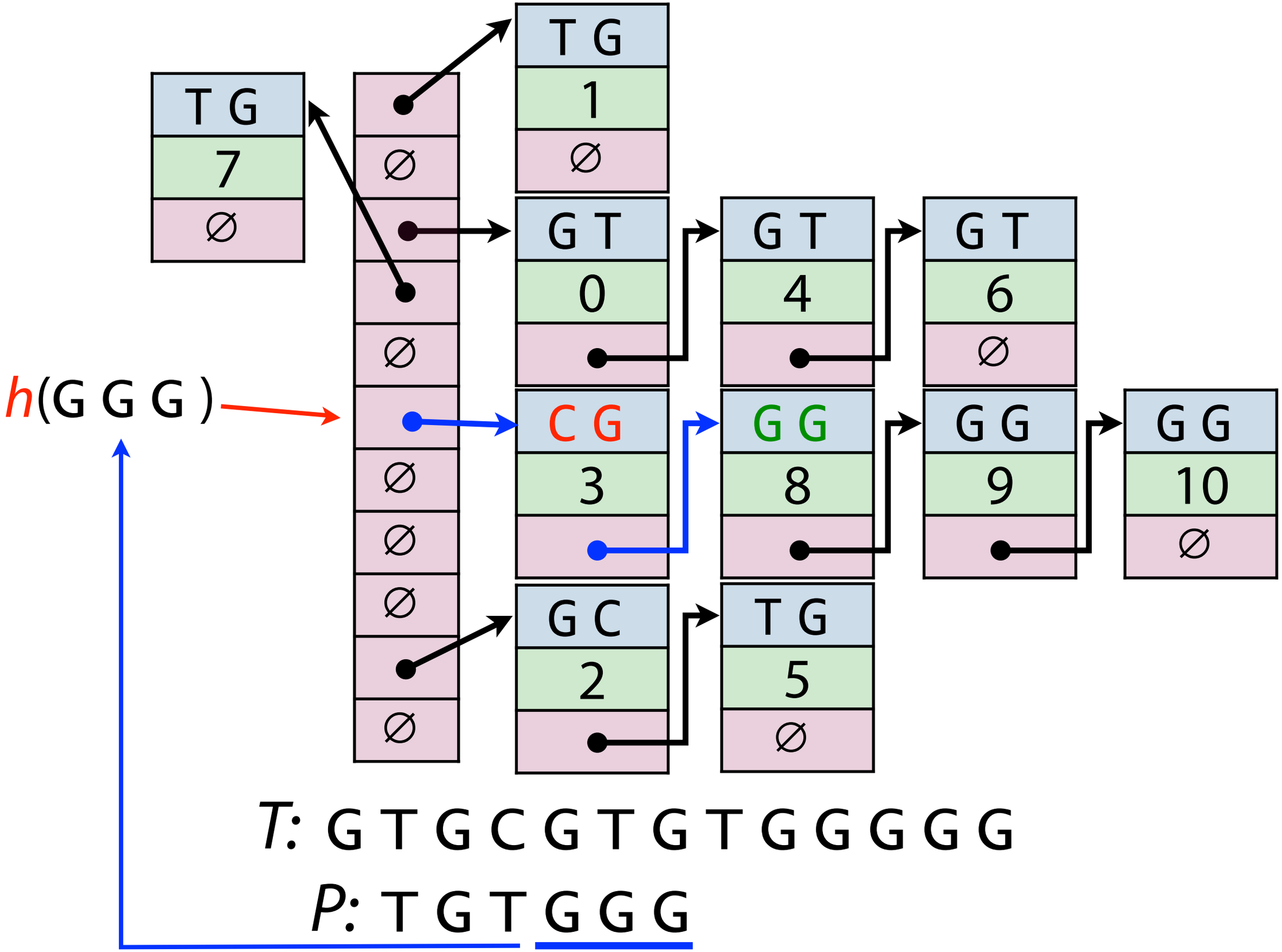

T G
7
∅
T G
1
∅
G T
0
G T
4
G T
6
∅
C G
3
G G
8
∅
G C
2
T G
5
∅
Collision
h(G G G)
T: G T G C G T G T G G G G G

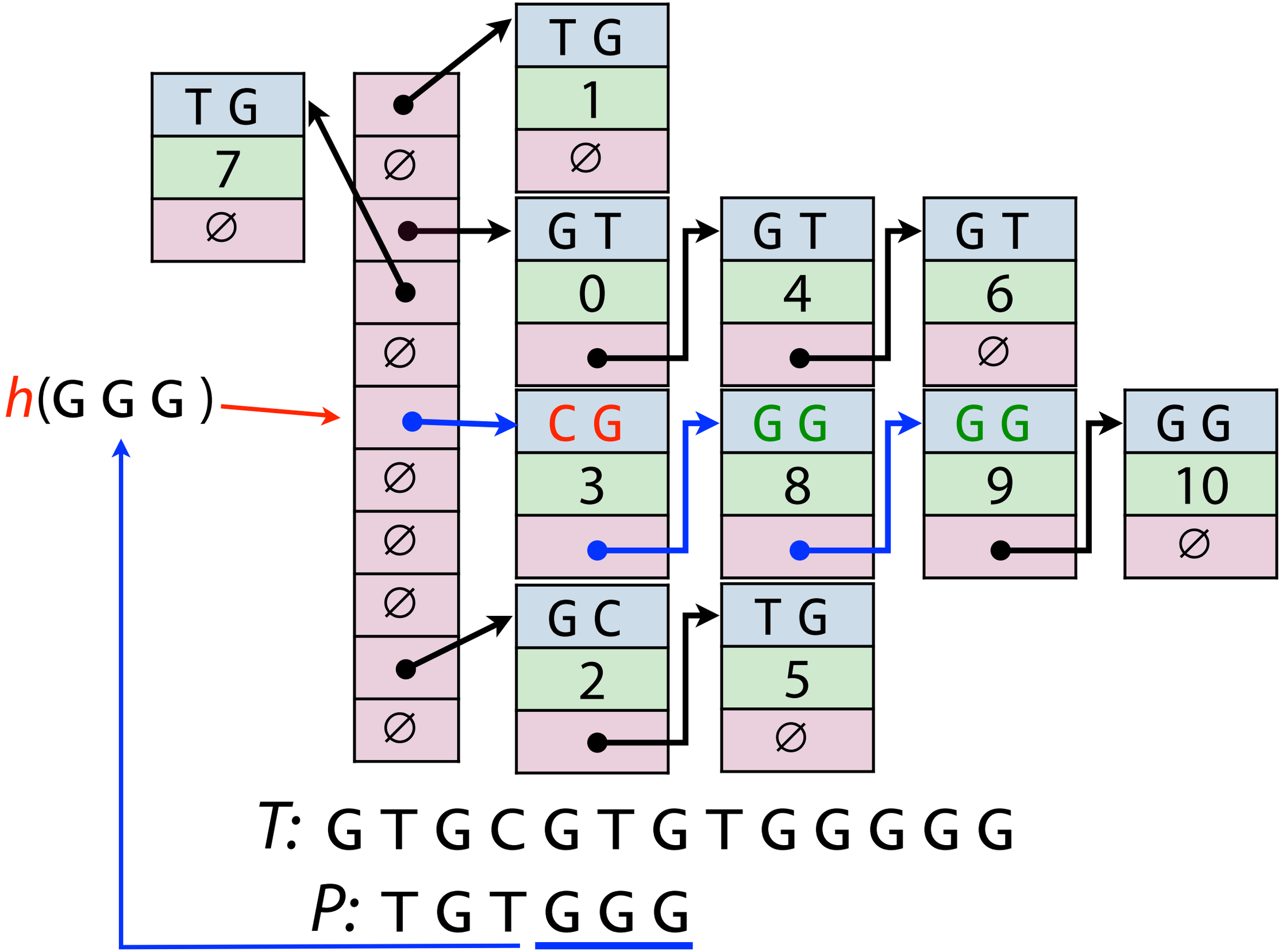

T G
7
∅
T G
1
∅
G T
0
G T
4
G T
6
∅
C G
3
G G
8
G G
9
∅
G C
2
T G
5
∅
h(G G G)
T: G T G C G T G T G G G G G

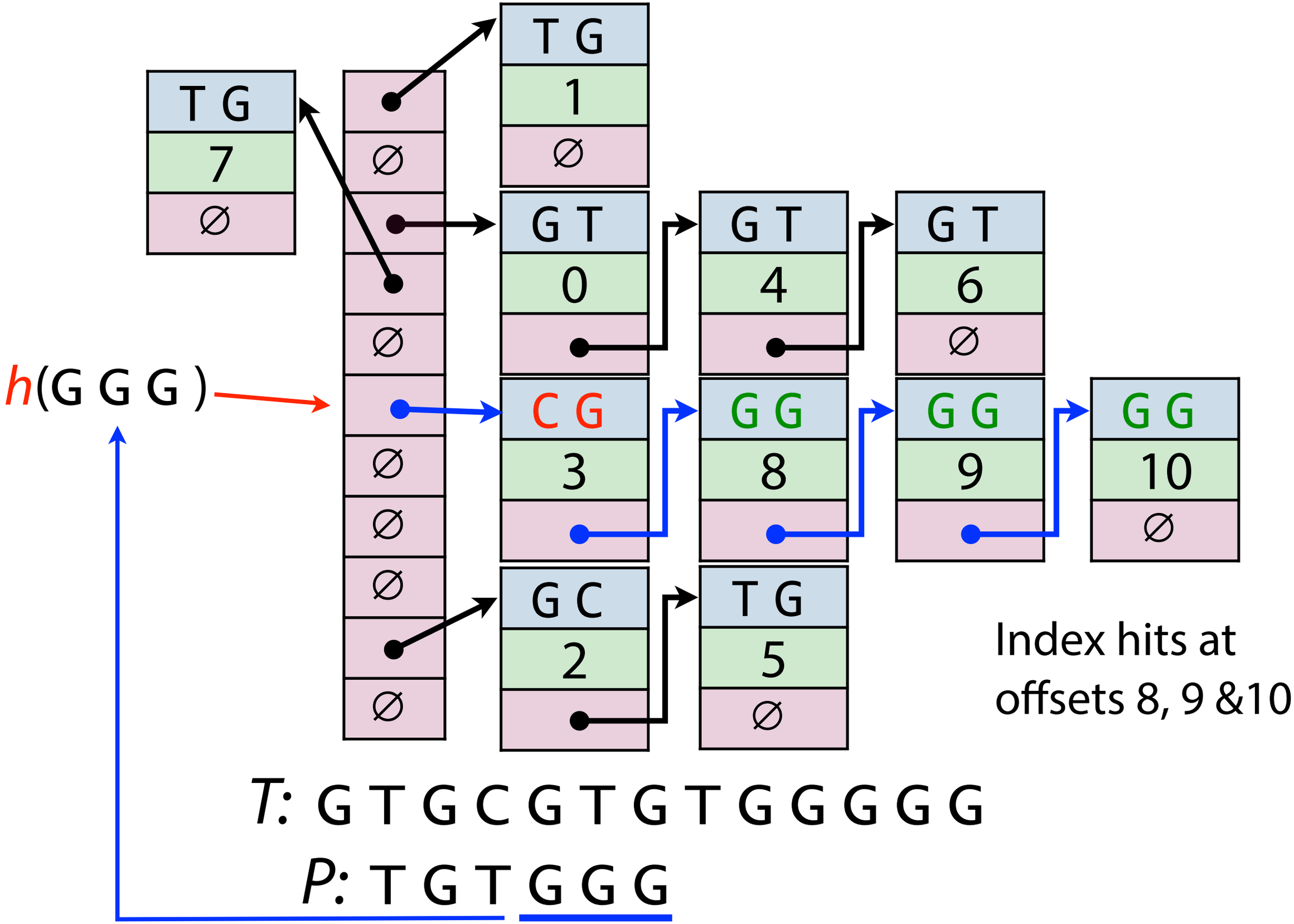

T G
7
∅
T G
1
∅
G T
0
G T
4
G T
6
∅
C G
3
G G
8
G G
9
G G
10
∅
G C
2
T G
5
∅
∅
∅
∅
∅
∅
∅
∅
∅
h(G G G)
T: G T G C G T G T G G G G G


T G
7
∅
T G
1
∅
G T
0
G T
4
G T
6
∅
C G
3
G G
8
G G
9
G G
10
∅
G C
2
T G
5
∅
∅
∅
∅
∅
∅
∅
h(G G G)
T: G T G C G T G T G G G G G
P: T G T G G G


T G
7
∅
T G
1
∅
G T
0
G T
4
G T
6
∅
C G
3
G G
8
G G
9
G G
10
∅
G C
2
T G
5
∅
∅
∅
∅
∅
∅
∅
∅
h(G G G)
T: G T G C G T G T G G G G G
P: T G T G G G


T G
7
∅
T G
1
∅
G T
0
G T
4
G T
6
∅
C G
3
G G
8
G G
9
G G
10
∅
G C
2
T G
5
∅
∅
∅
∅
∅
∅
∅
h(G G G)
T: G T G C G T G T G G G G G
P: T G T G G G


T G
7
∅
T G
1
∅
G T
0
G T
4
G T
6
∅
C G
3
G G
8
G G
9
G G
10
∅
G C
2
T G
5
∅
h(G G G)
T: G T G C G T G T G G G G G
P: T G T G G G


T G
7
∅
T G
1
∅
G T
0
G T
4
G T
6
∅
h(G G G)
C G
3
G G
8
G G
9
G G
10
∅
G C
2
T G
5
∅
Index hits at
offsets 8, 9 &10
T: G T G C G T G T G G G G G
P: T G T G G G

Python dictionary

```
>>> t = 'GTGCGTGTGGGGG'
>>> table = {'GTG':[0, 4, 6], 'TGC':[1],
             'GCG':[2], 'CGT':[3], 'TGT':[5],
             'TGG':[7], 'GGG':[8, 9, 10]}
>>> table['GGG']
[8, 9, 10]
>>> table['CGT']
[3]
```