Core Java

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Collection hierarchy

key = roll, value = Student

Student[]

```
 0
 1
 2
 3
 4
 5
 6
 7
 8
 9
```

r=1
=
=

r=4
=
=

r=8
=
=

r=5
=
=
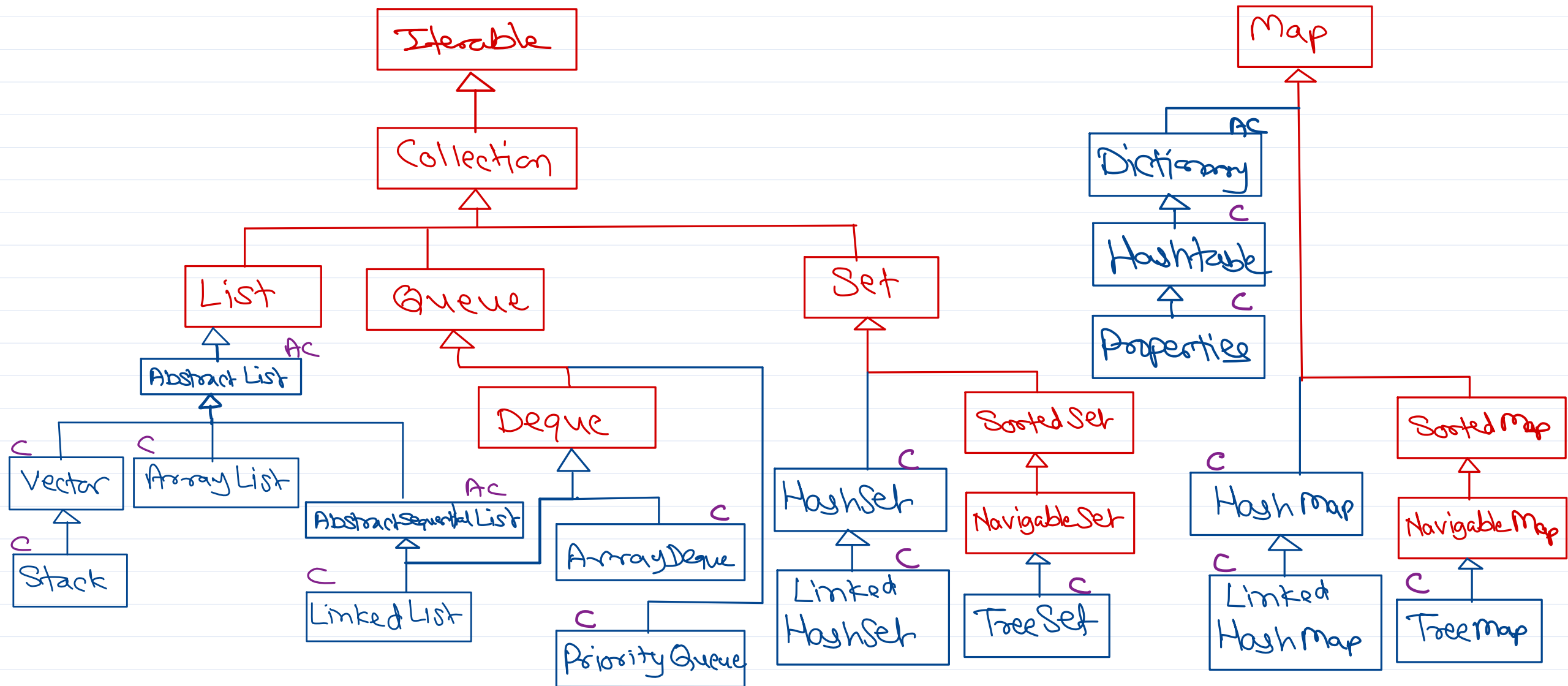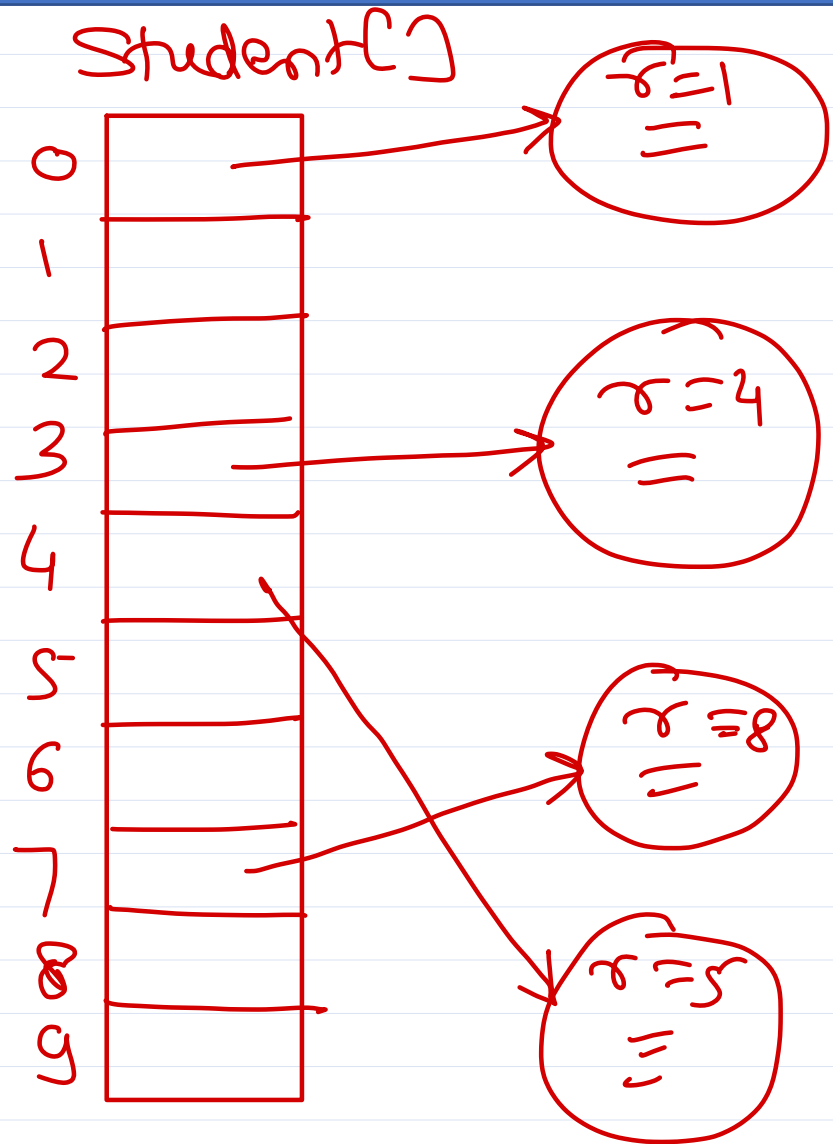
index = roll -1

array → table
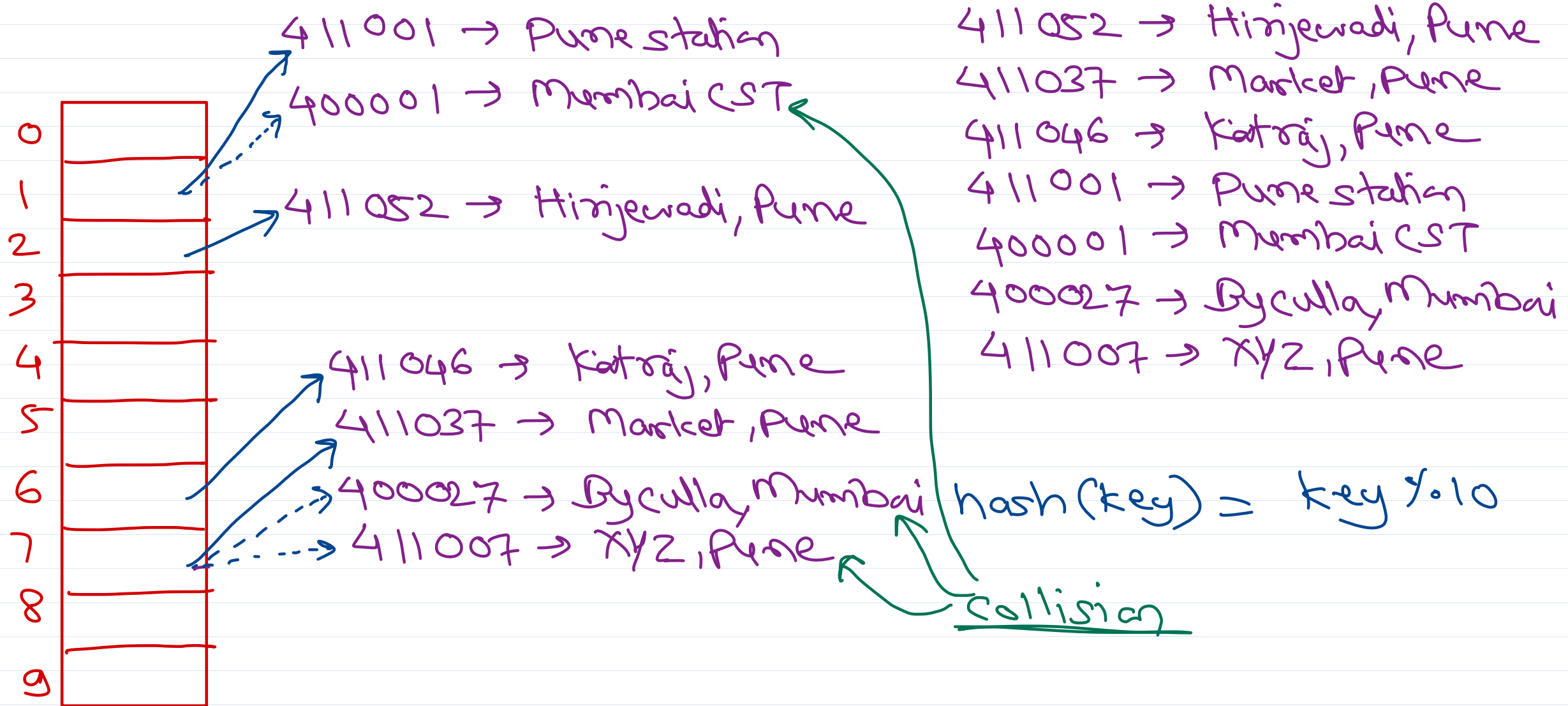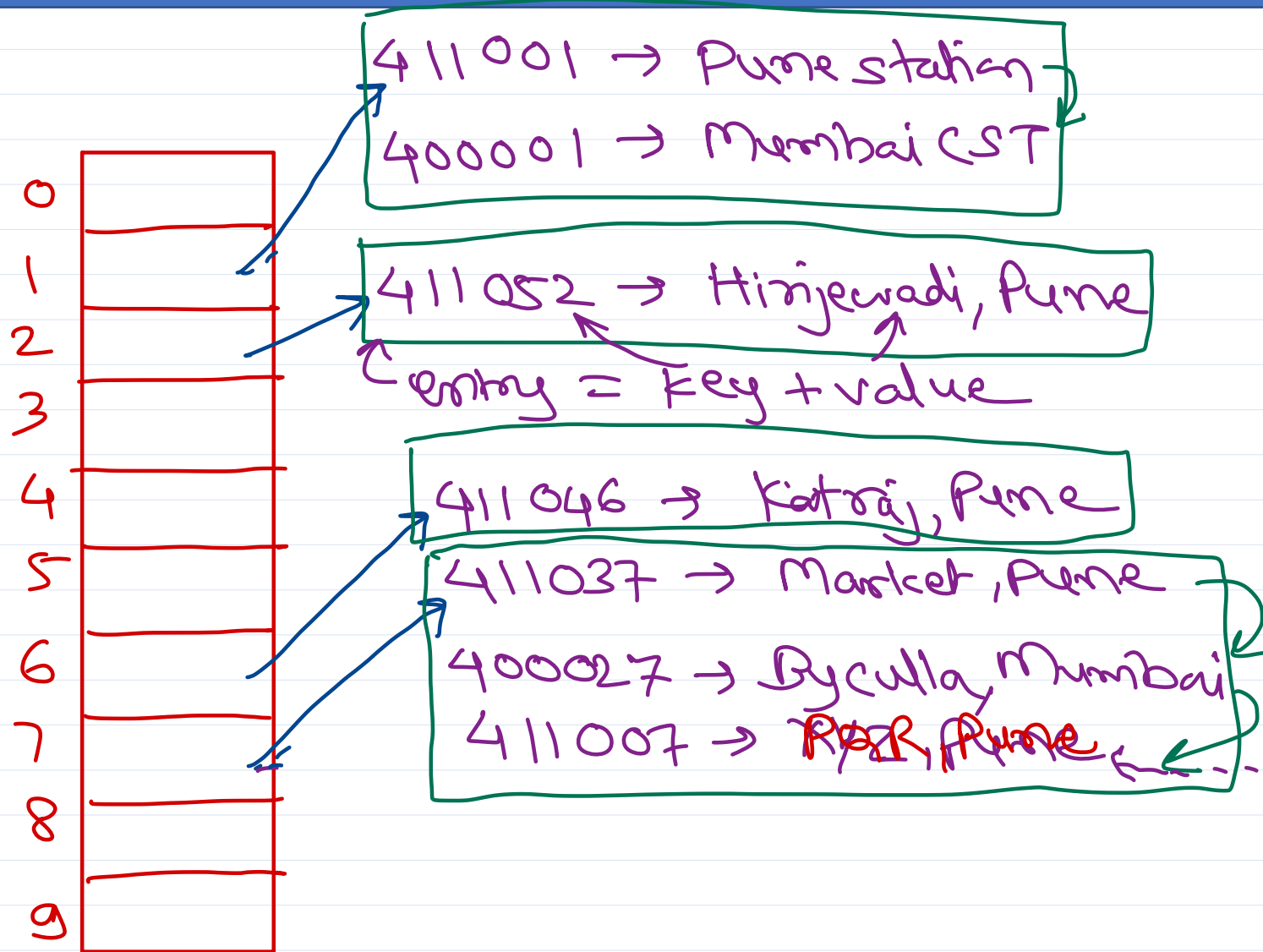index → slot
math
formula → hash fn

hash fn is math fn of key, that yields slot of the table in which element is to be stored/searched.

key = pin, value = "area"

411001 → Pune station
400001 → Mumbai CST

411052 → Hinjewadi, Pune

411046 → Katraj, Pune
411037 → Market, Pune
400027 → Byculla, Mumbai
411007 → XYZ, Pune

411052 → Hinjewadi, Pune
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hash(key) = key % 10

Collision

key = pin, value = "area"

411001 → Pune station
400001 → Mumbai CST

411052 → Hinjewadi, Pune
entry = key + value

411046 → Katraj, Pune

411037 → Market, Pune

400027 → Byculla, Mumbai

411007 → PQR, Pune

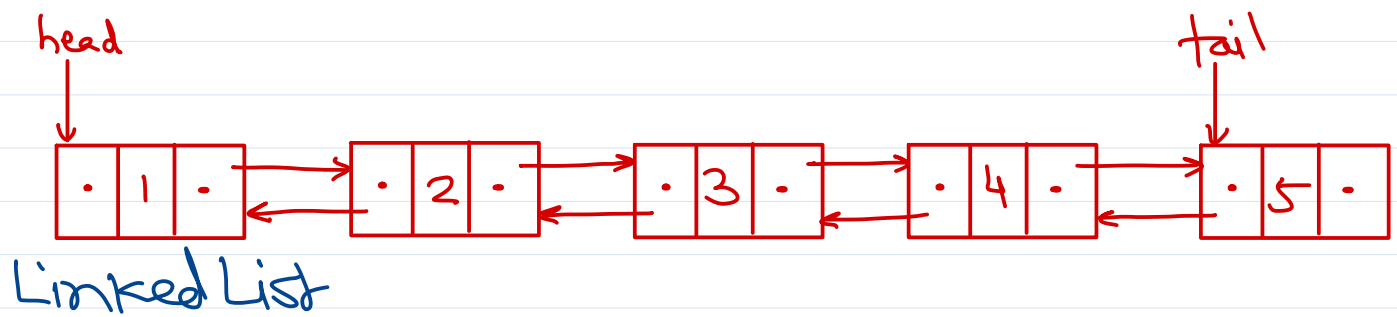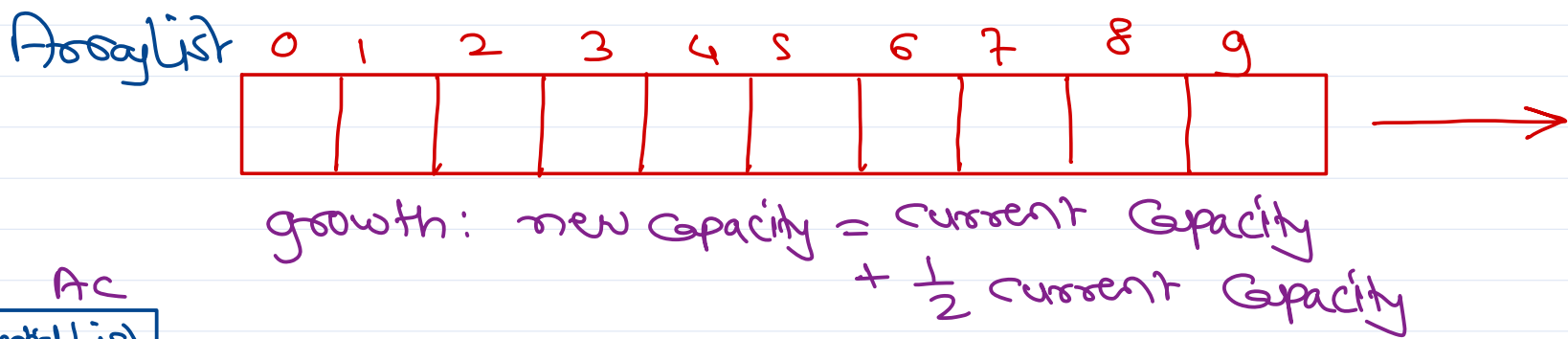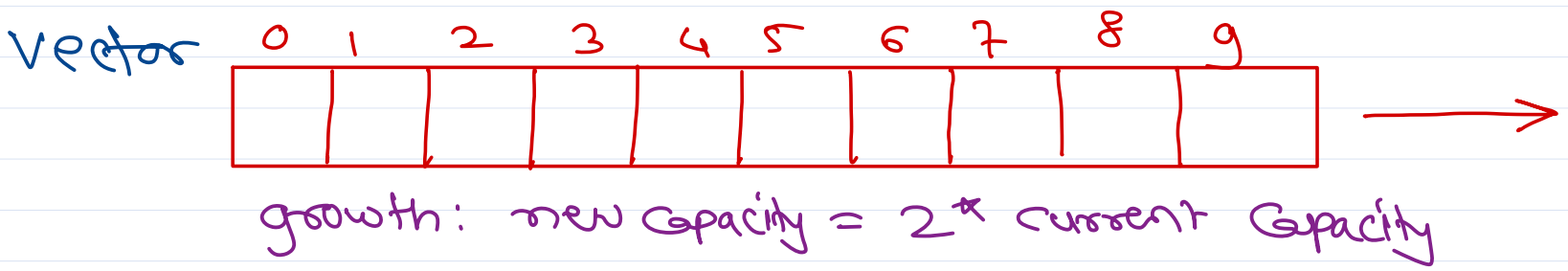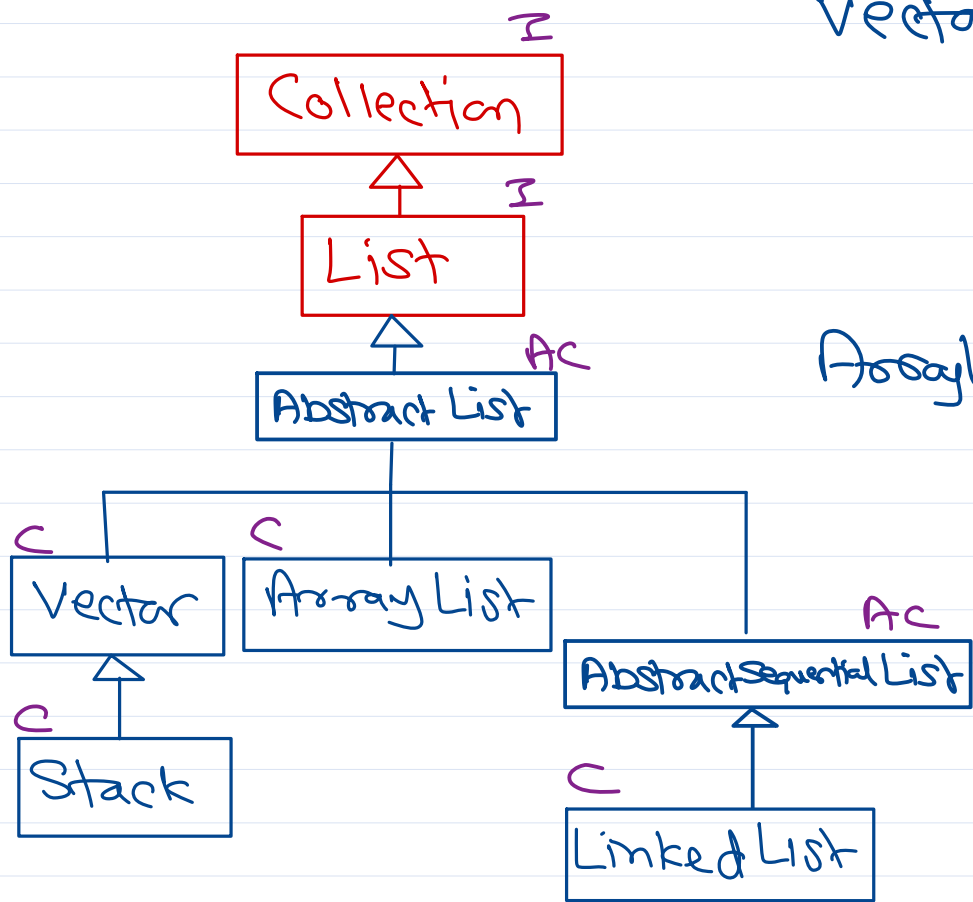|	
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	

411052 → Hinjewadi, Pune
411037 → Market, Pune
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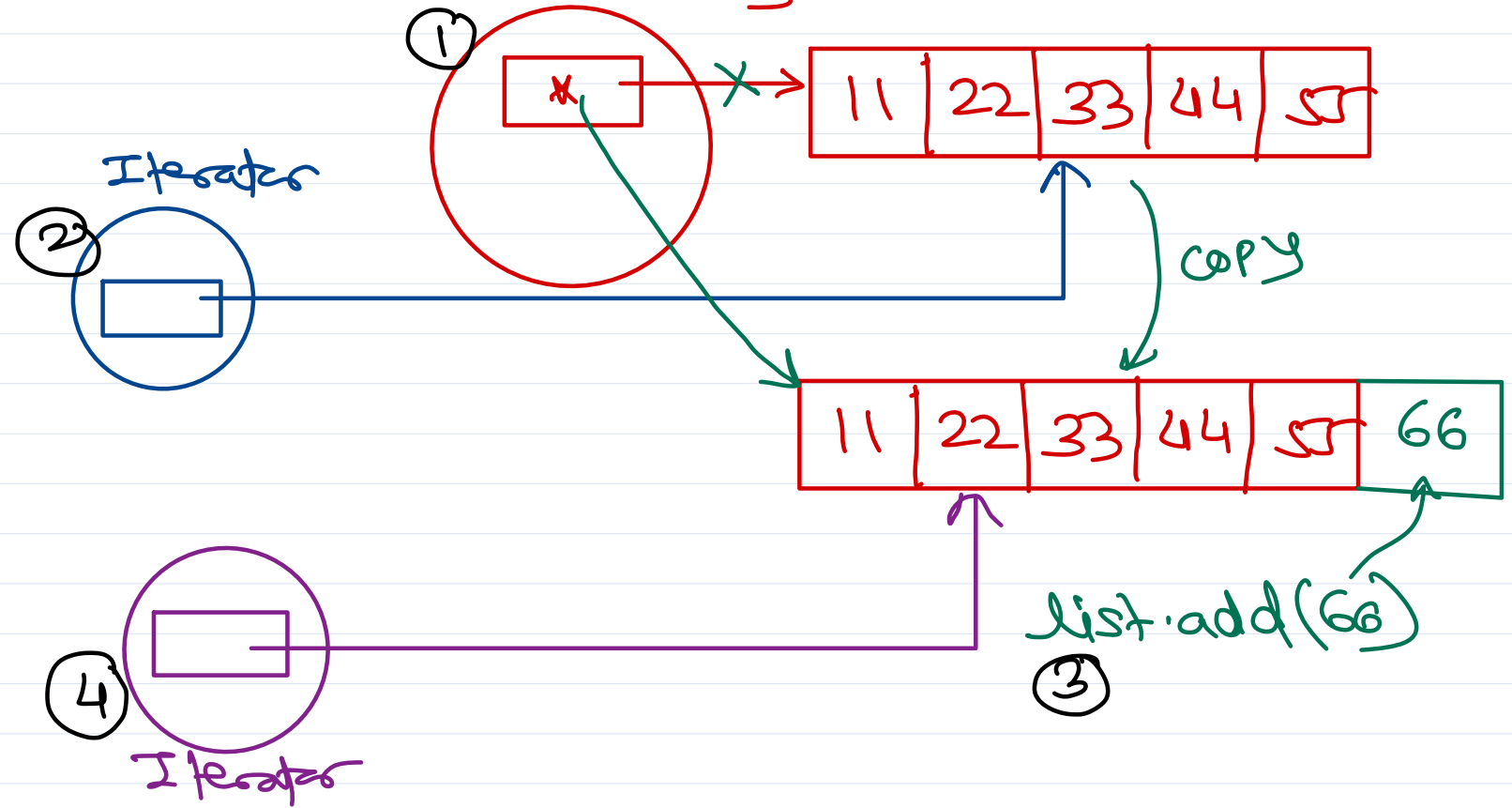400027 → Byculla, Mumbai
411007 → XYZ, Pune
411007 → PQR, Pune

$hash(key) = key \% 10$

$load\ factor = \dfrac{num\ of\ entries}{num\ of\ slots}$

List hierarchy


```
Collection   I
    ↑
  List   I
    ↑
Abstract List   AC
```

Vector   C
Array List   C
Stack   C
Abstract Sequential List   AC
Linked List   C

Vector   0 1 2 3 4 5 6 7 8 9

growth: new Capacity = 2 * current Capacity

ArrayList   0 1 2 3 4 5 6 7 8 9

growth: new Capacity = current Capacity + ½ current Capacity

head

tail

. 1 .   . 2 .   . 3 .   . 4 .   . 5 .

Linked List

COW Array List

① | x | ---X--> | 11 | 22 | 33 | 44 | 55 |

Iterator

② [ ]

copy

list.add(66)

③ | 11 | 22 | 33 | 44 | 55 | 66 |

④ [ ]

Iterator

Queue

poll() ← [| | | |] ← offer()

Deque

offerFirst() → [| | | |] ← offerLast()

pollFirst() ← [| | | |] → pollLast()

Thank you!

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