

1. ArrayList    Vector

List

List

Collection

HashSet

HashSet

hashset

ArrayList    Vector

ArrayList    Vector

Vector

ArrayList

ArrayList

Vector

Vector&ArrayList    Hashtable&HashMap

Vector    Hashtable    java

ArrayList    HashMap    java2

ArrayList      Vector

ArrayList      Vector

Vector

ArrayList 1.5

ArrayList      Vector

Vector

ArrayList

Vector

ArrayList

0.5

2.      ArrayList, Vector, LinkedList

ArrayList      Vector

Vector

synchronized

ArrayList

LinkedList

ArrayList

LinkedList

3.      (fail-fast)

(fail-safe)

Iterator

java.util

java.util.concurrent

ConcurrentModificationException

4. hashmap

java

hashmap

HashMap

"

"

enter image description here

## 5. HashMap ?

Java HashMap (key-value) HashMap

hash hashCode() equals() /

put() HashMap key hash

key value

HashMap (capacity) (load factor)

(threshold resizing)

## 6. Hashmap

hashmap loadFactor

loadFactor 0.75 16

hashmap  $16 \cdot 0.75 = 12$   $2^{16} = 32$

hashmap

hashmap 1000 new HashMap(1000),

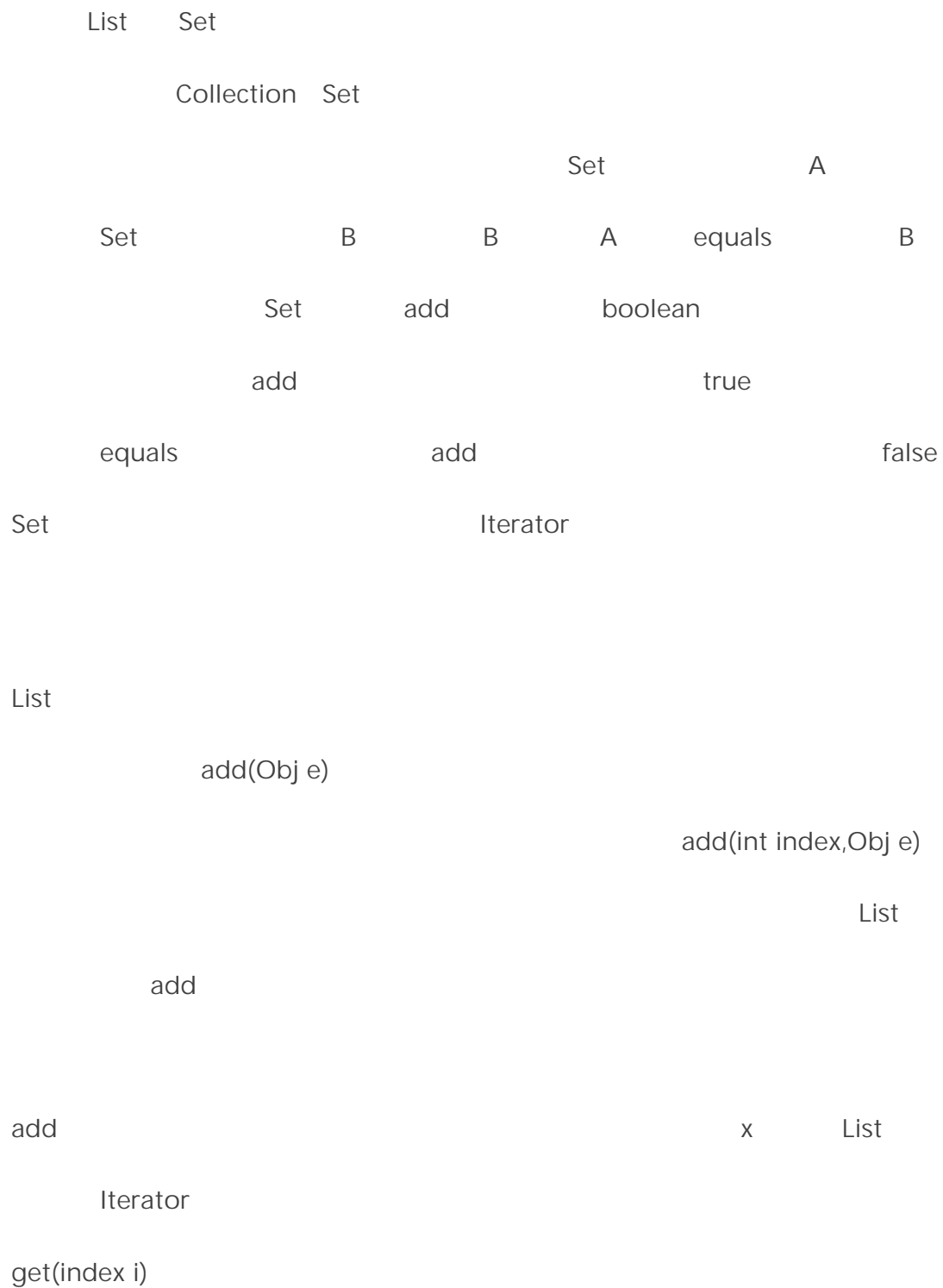
new HashMap(1024) annegu

1000 hashmap 1024 new HashMap(1024)

$0.75 \cdot 1000 < 1000$ ,  $0.75 \cdot \text{size} > 1000$ ,

new HashMap(2048) & resize

## 7. List Map Set



Map      List      Set

put

```
put(obj key,obj value)
```

key/value

key

equals

key

value

```
get(Object key)
```

key

value

key

value

key

value

## Map.Entry

List

Set

1

Map

key-value

value

## HashSet

hashCode

hashCode

"abc" ---> 78   "def" ---> 62   "xyz" ---> 65

hashCode

62,65,78

## LinkedHashSet

hashCode

```
! hashset
```

hashCode

equals

new

Student

## HashSet

## HashSet

size

hashCode

equals

size

Vector

## HashSet

## 8. Set

? = =

equals()?

?

Set

equals()

equals() ==

equals()

9.

(x.equals(y) == true)

hash code

?

HashSet

HashMap

equals

hashCode

HashSet

HashMap

hashCode

hashCode

arrayList

hashCode

10. heap    stack

Java

new

final

11. Java

Java

Java

Collection

Set

Collection

List

collection

Map

(key)

(value)

12. HashSet

TreeSet

HashSet

hash

add()

remove()

contains()

TreeSet

add()

remove()

contains()

$O(\log n)$

13. HashSet

?

HashSet

HashMap

HashSet

HashMap

HashSet

HashMap

HashSet

HashSet

HashMap

key

HashMap

false

14. LinkedHashMap

?

LinkedHashMap

HashMap

Entry

header

header

Table



LinkedHashMap          hashMap          Entry,          Entry  
before,after,          header  
LinkedHashMap          accessOrder          boolean  
true          false

15.          Cloneable          Serializable  
(cloning)          (serialization)

16.          (Iterator)

Iterator

remove(Object Obj)          remove()

17. Iterator          ListIterator

Iterator          Set          List          ListIterator          List

Iterator          ListIterator

ListIterator          Iterator

18.        (Array)        (ArrayList)        Array

ArrayList

Array                                  ArrayList

Array                                  ArrayList

ArrayList

19. Java

Array

ArrayList

hash

ClassCastException

JDK

(immutable class)

Map

hashCode()    equals()

0

null

20. Set

==

equals()

Set

iterator()

equals()

Set

equals() ==

equals()

## 21. Comparable Comparator

Java

compareTo()

Comparable

0

Java

compare()

equals()

Comparator

compare()

0

equals()

comparator

comparator

comparator

true

## 22. Collection Collections

collection

1

set

list

collections

.

/ /