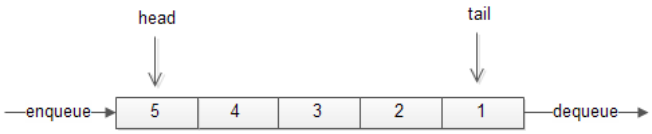
Hash set

- Duplicates Elements are not allowed
- If you add duplicates also –After Compiling – Duplicates will be not printed in the Console
- Insertion Order is Not Preserved – Generally insertion is not preferred. if you want to for insertion you may go

Elements arranged in Hash set are



Methods in hash set

S.no	Description	Methods	Notes
1	Difference between two sets	set1.removeall(set2)	Modifies set1 to remove elements present in set2.
2	Unique Elements in two sets or Union of two sets	set1.Addall(set2)	Modifies set1 to add all elements from set2.
3	Common elements in two sets Or intersection of two sets	set1.retainall(set2)	Modifies set1 to retain only elements present in both set1 and set2.

Note: -- hash set don't allow the Duplicate elements

Linked-Hash set

Methods, which are available in Hash set, are available in Liked List as well

Here we will some differences

S.No.	Hash Set	Linked Hash set
1	Duplicates are not allowed	Duplicates are not allowed
2	Insertion Order not Preserved	Insertion order is Preserved
3	Data Structure – Hash Table	Data Structure – Hash Table + Linked List
4	Elements are printed in Random Order in Console	Elements are printed in Given Order- Here we have Concept of Linked List –in Hash set
5	Given – 1,2,3,4 Console --- 4,1,3,2	Given – 1,2,3,4 Console --- 1,2,3,4
6	Initial Capacity = 16 and load factor = 0.25	Initial Capacity = 16 and load factor = 0.75

Queue (Interface) ------Deque (interface)

S.no.	Description	Method	When elements are Empty –what its Returns
1	To add the elements into Que	add ()	Exception
2	To add the elements into Que	offer ()	False
3	To Return the elements into Que	element ()	Exception
4	To Return the elements into Que	peek ()	Null
5	To Return and Remove the elements into Que	remove ()	Exception
6	To Return and Remove the elements into Que	poll ()	Null

Map (Interface)

1. Map is independent
2. No relation between Map and Collection interface
3. When –when you want to represent Objects in the form of Key and Value – pairs

S.no	Key	Value
1	101	Lion
2	102	Cheetah
3	103	Tiger
4	104	Rider
5	Null	Lion
6	105	Null
7	106	Null

4. Keys should be Unique
5. Value may be duplicated
6. Key + value = pair
7. Combination Single key + Single value = One Entry
8. So, Hash map is a Collection of Entries

Similarities of Hash Map and Hash Table

1. When we want to work with Key and Value pair we will go with Hash Map or Hash Table concept
2. Under lying Data Structure for both the classes is Hash Table , Internally It will follow- Hash code- to store the Data

S.no	Hash-Map	Hash Table
1	Non - Synchronized - 1. Multiple threads can work on same method at a time - No waiting Period	Synchronized: 1. When we have n number of methods in the Hash Table, multiple threads cannot work on the same method simultaneously. 2. Threads have to work one after the other. 3. Other threads should wait while one thread is working. 4. Only one thread is allowed to execute the method at a time.
2	Not Thread Safe	Thread Safe
3	Performance is faster	Performance is Poor
4	1. For A key It will accept Single Null --- Values May be Multiple Nulls 2. Nulls are accepted	Nulls Cannot accepted Either as Key or Value

Difference between Hash Map and Hash Table

Classes in Map

1. Hash map (class)

1. In hash map Under- Lying Data Structure is Hash-table
2. Insertion order not preserved. - Elements we have stored in the given order will not be stored in the same order.
3. Keys should be Unique
4. Duplicate Keys are Not allowed
5. Duplicate values are Not allowed
6. Only Null key is allowed
7. Duplicate null values may be allowed
8. Searching will be faster in Hash Map

Methods in Hash map Class			
S.no.	*Description*	*Methods*	*Notes*
1	To add a pair in Hash map	put (key, value)	
2	To add a Hash map collection	putAll(map collection)	
3	To get the Value from the key	get(key)	which will return value based on the key we have passed
4	To remove key and value	remove(key)	which will remove entire entry key and value
5	To know key	contains key(key)	1.key present - true 2..key not present-false
6	To know value	contains value(value)	1.Value present - true 2.Value not present-false
7	To check Hash map is Empty	is Empty()	1. Data is Present returns True 2. Data is not Present returns False
8	To know How many entries in the Collection	size ()	
9	To clear all the Entries from the Hash map	clear ()	
10	To return keys	Keyset ()	1. This method will get all keys in as et – return as Object
11	To return Values	Values ()	This will return all the Values as a Collection
12	It will return all Entry from the Hash Map- as a Set individually	entrySet ()	

9. Special Methods are keyset () and values ()

Keyset () --------Object ----------Unique --------As Keys are Unique
Values () --------Collection ----------Duplicate –Values -----As Values Duplicates are Allowed

2. Entry interface

1. Hash-Map has n number of Entries – we can represent these entries by Entry interface
2. Entry interface certain methods
3. We can use those methods only on the Entry objects from the Hash map

Methods in Entry interface

1. getkey()

	Key	Value
e	101	x

2. when e is representing key and value (Single object)– when we write e. getkey()--- it will get the key
   Result is -----101
3. when e is representing key and value – when we write e. getvalue()--- it will get the value
   Result is -----x

4. when e is representing key and value – when we write e. setvalue(object)--- it will replace the value
   Result is -----Object
5. To print Key and Value line by line we will go with For loop

3. Hash table (class)

1. Default capacity of Hash-table is 11
2. Load factor is 0.75
3. Declaration
   Example of Hash Table

https://gist.github.com/Sameer-Programmer/b2494768f8bf9c9112f3f4b3fa31cbfa

Programs Related to Hash Set, Hash-Map, Has Table

https://github.com/Sameer-Programmer/Java/tree/master/example/Sameer_Collection_Class

[HashTable(classes)](https://www.mindmeister.com/app/map/2871857060?t=1ox7ICkZXn)