

SATURDAY, JANUARY 28, 2017

## Difference between IdentityHashMap and HashMap in Java

IdentityHashMap in Java was added in Java 1.4 but still it's one of those lesser known class in Java. The main difference between IdentityHashMap and HashMap in Java is that IdentityHashMap is a special implementation of Map interface which doesn't use `equals()` and `hashCode()` method for comparing object unlike other implementation of Map e.g. HashMap. Instead, IdentityHashMap uses equality operator `"=="` to compare keys and values in Java which makes it faster compare to HashMap and suitable where you need reference equality check and instead of logical equality. By the way, IdentityHashMap is a special implementation of Map interface much like `EnumMap` but it also violates general contract of Map interface which mandates using equals method for comparing Object. Also, IdentityHashMap vs HashMap is a [good Java question](#) and have been asked a couple of times.

Even though this question is not as popular as [How HashMap works in Java](#) or [Difference between Hashtable and HashMap](#), it's still a good question to ask. In this Java tutorial, we will see an example of IdentityHashMap and explores some key differences between IdentityHashMap and HashMap in Java.

## Difference between IdentityHashMap and HashMap



Though both HashMap and IdentityHashMap implements Map interface, have fail-fast Iterator and non-synchronized collections, following are some key *differences between HashMap and IdentityHashMap in Java*.

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1) The main difference between *HashMap* vs *IdentityHashMap* is that *IdentityHashMap* uses equality operator "==" for comparing keys and values inside Map while *HashMap* uses [equals method](#) for comparing keys and values.

2) Unlike *HashMap*, who uses hashCode to find bucket location, *IdentityHashMap* also doesn't use `hashCode()` instead it uses `System.identityHashCode(object)`.

3) Another key difference between *IdentityHashMap* and *HashMap* in Java is Speed. Since *IdentityHashMap* doesn't use `equals()` its comparatively faster than *HashMap* for object with expensive [equals\(\) and hashCode\(\)](#).

4) One more difference between *HashMap* and *IdentityHashMap* is Immutability of the key. One of the basic requirement to safely store [Objects](#) in *HashMap* is keys needs to be immutable, *IdentityHashMap* doesn't require keys to be immutable as it is not relied on equals and hashCode.

There is also a class called *IdentityHashtable* which is analogous to [Hashtable in Java](#) but it's not part of standard JDK and available in `com.sun...` package.

### Example of IdentityHashMap in Java

Here is an example of *IdentityHashMap* in Java which shows the key difference between *HashMap* and *IdentityHashMap* in comparing Objects. *IdentityHashMap* uses equality operator for comparison instead of equals method in Java :

```
import java.util.IdentityHashMap;

/**
 * Java program to show difference between HashMap and IdentityHashMap in Java
 * @author Javin Paul
 */
public abstract class Testing {

    public static void main(String args[]) {
```

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```

IdentityHashMap<String, String> identityMap = new IdentityHashMap<String, String>();

identityMap.put("sony", "bravia");
identityMap.put(new String("sony"), "mobile");

//size of identityMap should be 2 here because two strings are different objects
System.out.println("Size of IdentityHashMap: " + identityMap.size());
System.out.println("IdentityHashMap: " + identityMap);

identityMap.put("sony", "videogame");

//size of identityMap still should be 2 because "sony" and "sony" is same object
System.out.println("Size of IdentityHashMap: " + identityMap.size());
System.out.println("IdentityHashMap: " + identityMap);

}
}

```

Output

```

Size of IdentityHashMap: 2
IdentityHashMap: {sony=bravia, sony=mobile}
Size of IdentityHashMap: 2
IdentityHashMap: {sony=videogame, sony=mobile}

```

That's all on the difference between `IdentityHashMap` and `HashMap` in Java. As I said `IdentityHashMap` violates `Map` interface general contract and should only be used when reference equality makes sense. As per Javadoc, `IdentityHashMap` is suitable to keep object reference during Serialization and deep copy and can also be used to maintain as a proxy object.

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By Javin Paul at [January 28, 2017](#) 

Labels: [collections interview questions](#), [core java](#), [core java interview question](#), [java collection tutorial](#)

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6 comments :

Anonymous said...

Hi, how about performance? I assume IdentityHashMap will perform better than HashMap because of reference comparison but how much performance gain you make when you switch from HashMap to IdentityHashMap?

[January 30, 2013 at 11:09 PM](#)

Anonymous said...

You will never have hash collison with IdentityHashMap :)

[February 4, 2013 at 9:28 PM](#)

Anonymous said...

What is meany by hash collision

[May 1, 2013 at 2:35 AM](#)

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Anonymous said...

What is hash collision?

May 7, 2014 at 3:29 AM

Json said...

What is the real life example where you want to use IdentityHashMap? I know that all meaningful object override equals() and hashCode but I think for things like database Connections, or file handles we can use this map as cache. agree?

December 17, 2014 at 1:38 AM

[Sandeep Kumar](#) said...

Article is great to read !  
I guess, few corrections required in terms of language used.


"...Instead, IdentityHashMap uses equality operator "==" to compare keys and values in Java which..."

Map do not compare Values, it only compares Keys. You should correct it where ever it is used.

January 30, 2018 at 12:43 AM

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3. [Microsoft SQL Server Documentation](#)
4. [Java SE 8 API Documentation](#)
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