| Hash map | Hash table |
|---|---|
| Not legacy class<br>Not synchronized / thread safe<br>Performance is high<br>Can add 1 null key and many null value | Legacy class<br>synchronized / thread safe<br>Performance is low<br>Null key and value not allowed |

**Map**

- Map is not child interface of collection
- If we want to represent group of object as key-value pairs then we should use map
  Ex. 101-Amit, 102-Vaibhav
- Both keys and value are objects only
- Duplicate keys are not allowed, but value can be duplicated
- Each key-value pair is called **entry** hence map is consider as collection of entry objects

Map interface methods

- put(key, value) //add key value pair to map, if key already present then old value will be replaced with new value and return old value
- putAll(map m) //add group
- get (key) // returned value associated with specified key
- remove (key) //remove the entry associated with specified key
- containsKey()
- containsValue()
- isEmpty()
- size()
- clear()
- keySet() // return key set
- values() // return values set
- entrySet()
- getKey()
- getValue()
- setValue()

Properties:

- underlying data structure – Hash table
- insertion order is not preserved, and based on hash code of keys
- heterogenous objects are allowed for both keys and values
- null key is allowed only once
- null value is allowed (any number of times)
- best choice for frequent search operation

| Hashmap | HashTable |
|---|---|
| Not synchronized | synchronized |
| Not thread safe | thread safe |
| High performance | Low performance |
| Null key and value allowed | Not allowed |
| Not legacy | Legacy |

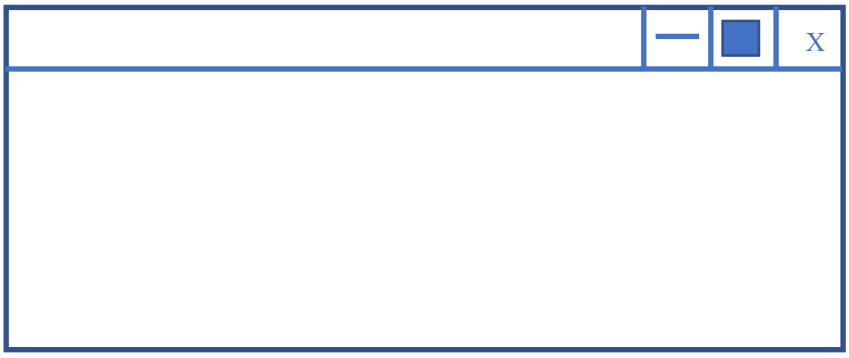
**Program:**

```
package CollectiionProg;

import java.util.HashMap;
import java.util.Iterator;
import java.util.Set;

public class HashMapProg {

	public static void main(String[] args) {

		HashMap hm = new HashMap();

		hm.put(3, "Ferrari");
		hm.put(2, "Lamborgini");
		hm.put(1, "Mastang");
		hm.put(4, "Porsh");

		System.out.println(hm);
		hm.put(null, "Twitter");
		System.out.println(hm);
		hm.put(null, "Meta");
		System.out.println(hm);
		hm.put(5, "ABC");
		hm.put(6, "ABC");
		hm.put(10.5, 'a');
		System.out.println("HM = " + hm);

		System.out.println("------------");
		System.out.println(hm.keySet());
		System.out.println(hm.values());
		System.out.println(hm.entrySet());

		System.out.println("------------");

		Set a = hm.entrySet();

		Iterator itr = a.iterator();

		System.out.println("For Output ------------");
		for(;itr.hasNext();)
		{
			System.out.println(itr.next());  //8    = 8
		}

		System.out.println("While Output ------------");
		while(itr.hasNext())
		{
			System.out.println(itr.next());
		}
```

```
        }
}
```

### 1) Child Browser

We can inspect, drag and drop, contain add, max, min and close option




```
Set (string) ids = driver.getWindowHandles();
String w1 = ids.get(1);
driver.switchTo().window(w1);
```

getWindowHandles() => Return all window address (main and child)
To handle the child browser popup we need to switch selenium focus from main page to child browser by using following syntax:
driver.switchTo.window(String abc);

**Program:**

Link1 :- https://www.aspsnippets.com/demos/1102/
Link1 :- https://skpatro.github.io/demo/links/

```
package Popup;

import java.util.Iterator;
import java.util.Set;

import org.openqa.selenium.By;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.chrome.ChromeDriver;

public class Windows1 {

        public static void main(String[] args) throws Exception {
                System.setProperty("webdriver.chrome.driver", "chromedriver");
                WebDriver driver = new ChromeDriver();
                driver.manage().window().maximize();
                driver.get("https://www.aspsnippets.com/demos/1102/");

                driver.findElement(By.xpath("//input[@value='Open Popup']")).click();

                Set<String> windows = driver.getWindowHandles();

                Iterator itr = windows.iterator();
```

```
//                  System.out.println("All windows");
//                  while(itr.hasNext())
//                        System.out.println(itr.next());
                    System.out.println("No of elements in collection = " + windows.size()); //2

                    String win[] = new String[3];
                    for(int i=0;i<windows.size();i++)
                    {
                          win[i] = (String) itr.next();
                          System.out.println(win[i]);
                    }

                    driver.switchTo().window(win[0]);  //Main window
                    System.out.println("Title of Win 0 = " + driver.getTitle());
                    driver.close();
                    Thread.sleep(5000);
                    driver.switchTo().window(win[1]);  //Small window
                    System.out.println("Title of Win 1 = " + driver.getTitle());
                    driver.close();


//                  Thread.sleep(5000);
//                  driver.close();
        }

}
```