# Map API Improvements: Fetch Operations

This lesson explains the new methods added in Map API for fetch operations.

**We'll cover the following**



If you have used `Map` then you must have faced a challenge where you needed to update the value of a key in the `Map`. Now, before updating, you must first check if the value is present in the `Map`, get the current value, update it, and again put the value in the `Map`. This is quite a cumbersome process, and it involves using lots of if/else statements. This kind of code is difficult to understand and fix if any issues occur.

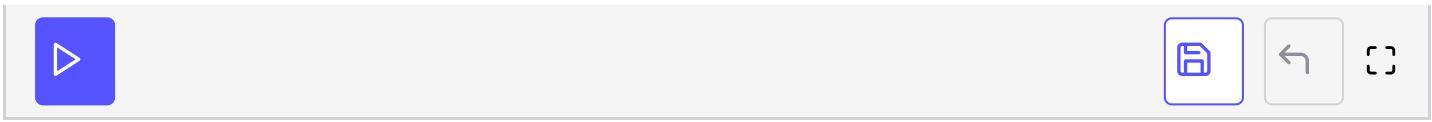
Thankfully, Java 8 has introduced some new methods in the `Map` interface to make our lives easier. In this lesson, we will discuss some of those new methods.

## 1. getOrDefault()

This method is a lifesaver if you need to update a certain key in the `Map`. The `getOrDefault()` method either returns the value of the key, or it returns the default value if the key is not present.

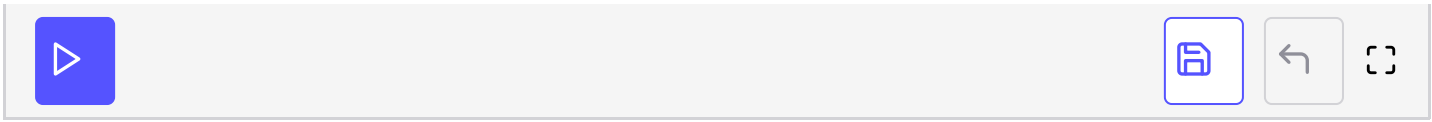
```
import java.util.HashMap;
import java.util.Map;

public class MapUpgrades {

  public static void main(String args[]){
    Map<String , Integer> fruits = new HashMap<>();
    fruits.put("apple", 20);

    // We need to add 20 bananas in map.
    // Below line will throw NullPointerException if banana
    //is already not present in the map.

    //fruits.put("banana", fruits.get("banana") + 20);
```

```
    //This is the correct way to update map value fefore Java 8
    if (fruits.containsKey("banana")) {
      fruits.put("banana", fruits.get("banana") + 20);

    } else {
      fruits.put("banana", 20);
    }
  }
}
```



Below is the same example using the `getOrDefault()` method. Now we don't need the if/else checks to update a value in the `Map`.

```
import java.util.HashMap;
import java.util.Map;

public class MapUpgrades {

  public static void main(String args[]){
    Map<String , Integer> fruits = new HashMap<>();
    fruits.put("apple", 20);

    fruits.put("banana", fruits.getOrDefault("banana", 0) + 20);
  }
}
```



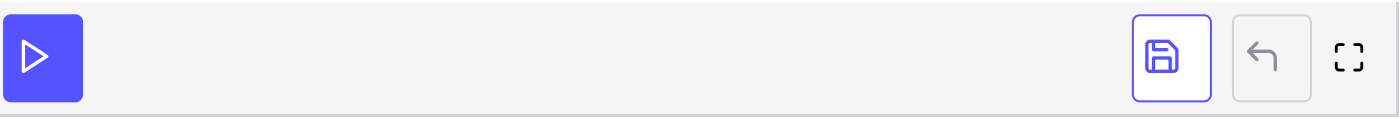
## 2. putIfAbsent()

You might be aware that the `put()` method in `Map` either inserts a key-value pair in the `Map` or updates the value if the key is already present. Now, what if you don't want to update the value in the `Map`. You want to insert a key-value pair only if it is not present in the `Map`.

This can be achieved by the `putIfAbsent()` method. This method inserts a key and value in the Map only if it is not present. Let's look at hoow it works in the example below.

```
import java.util.HashMap;
import java.util.Map;

public class MapUpgrades {

  public static void main(String args[]){
    Map<String , Integer> fruits = new HashMap<>();

    fruits.put("apple", 20);
```

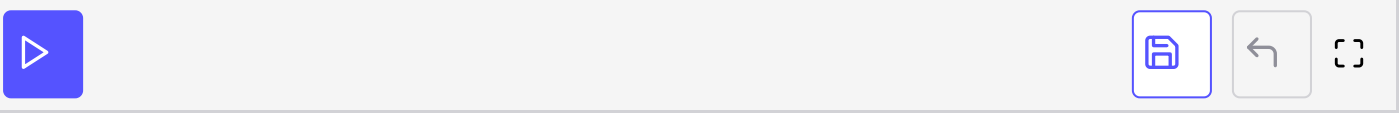
```
    System.out.println(fruits.get("apple"));

    fruits.putIfAbsent("apple", 30);

    System.out.println(fruits.get("apple"));
  }
}
```



## 3. compute(), computeIfAbsent() and computeIfPresent()

The `compute()` method computes a new mapping given the key and its existing value. This method returns the computed value. If the key is not present in the map, then an exception is thrown.

```
import java.util.HashMap;
import java.util.Map;

public class ComputeExample {

  public static void main(String args[]) {
    Map<String, Integer> fruits = new HashMap<>();
    fruits.put("apple", 20);

    int val = fruits.compute("apple", (k, v) -> v + 10);

    System.out.println(val);
    // Below line will throw Null Pointer Exception.
    //val = fruits.compute("banana", (k, v) -> v + 10);

  }
}
```



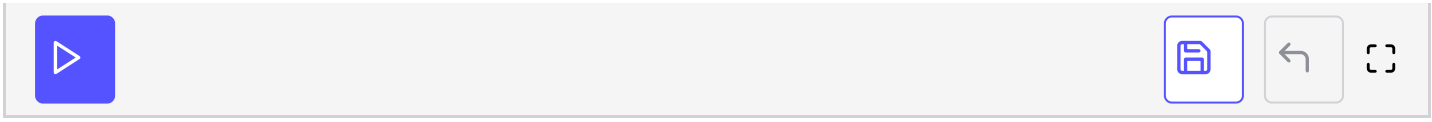
The `computeIfAbsent()` method returns:

- The original value if the key is already present in the map.
- The computed value if the key is not present in the map.

This method takes a key and a `Function` as a parameters.

```
import java.util.HashMap;
import java.util.Map;
```

```
public class ComputeIfAbsentExample {

  public static void main(String args[]) {

    Map<String, Integer> fruits = new HashMap<>();
    fruits.put("apple", 20);

    int val = fruits.computeIfAbsent("apple", v ->  10);

    System.out.println(val);

    val = fruits.computeIfAbsent("banana", v ->  10);

    System.out.println(val);
  }
}
```

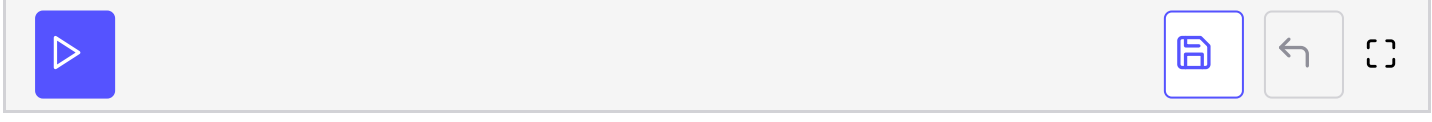


The `computeIfPresent()` method returns:

- A null value if the key is not present in the map.
- The computed value if the key is present in the map.

This method takes a key and a `BiFunction` as parameters.

```
import java.util.HashMap;
import java.util.Map;

public class ComputeIfPresentExample {

  public static void main(String args[]) {
    Map<String, Integer> fruits = new HashMap<>();
    fruits.put("apple", 20);

    Integer val = fruits.computeIfPresent("apple", (k, v) -> v + 10);

    System.out.println(val);

    val = fruits.computeIfPresent("banana", (k, v) -> v + 10);

    System.out.println(val);
  }
}
```



In the next lesson, we will look at some more improvements done to the `Map` Interface.