Filtering Operations in Stream

This lesson discusses filtering operations in streams.

We'll cover the following

- filter() method
- filter() with custom object
- filter() chaining

The filtering operations filters the given stream and returns a new stream, which contains only those elements that are required for the next operation.

`filter()` method

The `Stream` interface has a `filter()` method to filter a stream. This is an intermediate operation. Below is the method definition of `filter()` method.

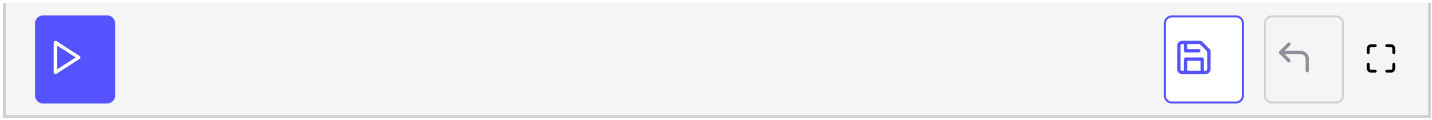
> **Stream filter(Predicate<? super T> predicate)**

Parameter -> A predicate to apply to each element to determine if it should be included.

Return Type -> It returns a stream consisting of the elements of this stream that match the given predicate.

```
import java.util.ArrayList;
import java.util.List;
import java.util.stream.Stream;

public class StreamDemo {

    public static void main(String[] args) {

        //Created a list of integers
        List<Integer> list = new ArrayList<>();
        list.add(1);
        list.add(12);
        list.add(23);
        list.add(45);
```

```
        list.add(6);

        list.stream()                           // Created a stream from the list
                .filter(num -> num > 10)        //filter operation to get only numbers greater than
                .forEach(System.out::println);  // Printing each number in the list after filtering

        //Again printing the elements of List to show that the original list is not modified.
        System.out.println("Original list is not modified");
        list.stream()
                .forEach(System.out::println);
    }
}
```



In the above example, we created a list of integers. We followed the below steps:

1. Create a stream from our list.
2. Apply a `filter()` operation on this stream. We want to print only those numbers which are greater than 10, so we add a filter.

Please note that the filter operation does not modify the original List.

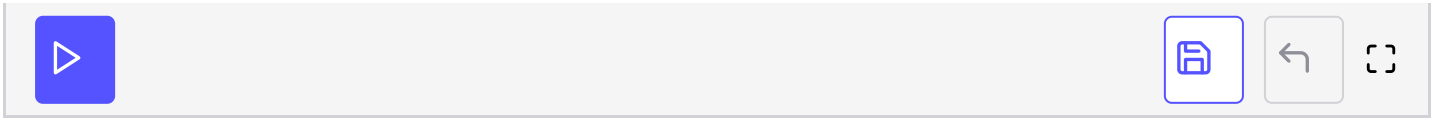
`filter()` with custom object

Let's look at another example of `filter()` with a custom object.

In the below example, we are using multiple conditions in the filter method.

```
import java.util.ArrayList;
import java.util.List;

public class StreamDemo {

    public static void main(String[] args) {
        //Created a list of Person object.
        List<Person> list = new ArrayList<>();
        list.add(new Person("Dave", 23));
        list.add(new Person("Joe", 18));
        list.add(new Person("Ryan", 54));
        list.add(new Person("Iyan", 5));
        list.add(new Person("Ray", 63));

        // We are filtering out those persons whose age is more than 18 and less than 60
        list.stream()
                .filter(person -> person.getAge() > 18 && person.getAge() < 60)
                .forEach(System.out::println);

    }
}

class Person {
    String name;
```

```
    int age;

    Person(String name, int age) {
        this.name = name;
        this.age = age;
    }

    public String getName() {
        return name;
    }

    public int getAge() {
        return age;
    }

    @Override
    public String toString() {
        return "Person{" +
                "name='" + name + '\'' +
                ", age=" + age +
                '}';
    }

}
```



In the above example, we used multiple conditions inside our filter.

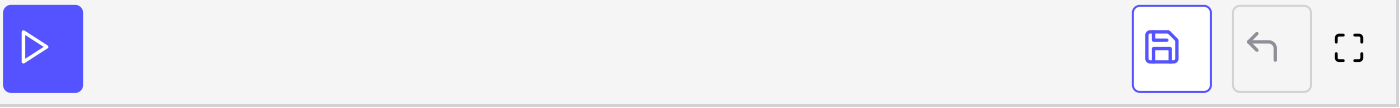
`filter()` chaining

In the above example, we wrote all the conditions in a single filter.

We can also chain the filter method to make the code more readable.

```
import java.util.ArrayList;
import java.util.List;

public class StreamDemo {

    public static void main(String[] args) {
        List<Person> list = new ArrayList<>();
        list.add(new Person("Dave", 23));
        list.add(new Person("Joe", 18));
        list.add(new Person("Ryan", 54));
        list.add(new Person("Iyan", 5));
        list.add(new Person("Ray", 63));

        list.stream()
                .filter(person -> person.getName() != null ) // Filtering the object where name is
                .filter(person -> person.getAge() > 18 ) // Filtering the objects where age is grea
                .filter(person -> person.getAge() < 60) // Filtering the objects where age is less
                .forEach(System.out::println);

    }
}
```

```
class Person {
    String name;
    int age;

    Person(String name, int age) {
        this.name = name;
        this.age = age;
    }

    public String getName() {
        return name;
    }

    public int getAge() {
        return age;
    }

    @Override
    public String toString() {
        return "Person{" +
                "name='" + name + '\'' +
                ", age=" + age +
                '}';
    }

}
```



Complete the following quiz to test what you've learned this lesson.

1 Which of the following is true about the `filter()` method? Choose all that apply.

2 The newly introduced Streams API is available in which package of Java 8?

Retake Quiz

In the next lesson, we will discuss the mapping operations in Stream.