Scala | Function Composition

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Function composition is a way in which a function is mixed with other functions. During the composition the one function holds the reference to another function in order to fulfill it's mission.
There are some different ways in which a function composition can take place, as below :-

- **compose :** Composing method works with **val** functions.
  Syntax :

  ```
  (function1 compose function2)(parameter)
  ```

  In the above syntax function2 works first with the parameter passed & then passes then returns a value to be passed to function1.

  Example 1:

  ```
  // A Scala program to illustrate
  // compose method with val function

  // Creatin object
  object GFG
  {
      // Main method
      def main(args: Array[String])
      {
          println((add compose mul)(2))
  ```

```
        println((add compose mul compose sub)(2))
    }

    val add=(a: Int)=> {
        a + 1
    }

    val mul=(a: Int)=> {
        a * 2
    }

    val sub=(a: Int) =>{
        a - 1
    }
}
```

Output :

```
5
3
```

In above example, firstly mul function called we got 4(2 * 2) than add function called and we got 5(4 + 1). similarly (add compose mul compose sub)(2) will print 3 (step1 : 2 – 1 = 1, step2 : 1 * 2 = 2, step3 : 2 + 1 = 3).

- **andThen :** andThen method also works with **val** functions.
  Syntax :

```
(function1 andThen function2)(parameter)
```

In the above syntax function1 works first with the parameter passed & then passes then returns a value to be passed to function2.
or as same as below:

```
function2(function1(parameter))
```

Example 2:

```
// A Scala program to illustrate
//andThen method with val function
```

```
        // Adding more methods
        println((add andThen mul andThen sub)(2))
    }

    val add=(a: Int)=> {
        a + 1
    }

    val mul=(a: Int)=> {
        a * 2
    }

    val sub=(a: Int) =>{
        a - 1
    }
}
```

Output :

```
6
5
```

In above example, firstly add function called we got 3(2 + 1) than mul function called and we got 6(3 * 2). similarly add (andThen mul andThen sub)(2)) will print 5 (step1 : 2 + 1 = 3, step2 : 3 * 2 = 6, step3 : 6 – 1 = 5).

Function composition is more like composing methods into another or passing to other methods. To do more control on methods we can use more ways as below:-

- **Passing methods to methods :** Methods are passed to other methods.
  Syntax :

```
function1(function2(parameter))
```

It works as same as compose function, but it works with def and val methods.

```
// A Scala program to illustrate
// passing methods to methods

// Creating object
object GFG
{
    // Main method
    def main(args: Array[String])
    {
        println(add(mul(2)))

        // Adding more methods
        println(add(mul(sub(2))))
    }

    val add=(a: Int)=> {
        a + 1
    }

    val mul=(a: Int)=> {
        a * 2
    }

    val sub=(a: Int) =>{
        a - 1
    }
}
```

Output :

```
5
3
```

In above example, firstly mul function called we got 4(2 * 2) than add function called and we got 5(4 + 1). similarly add(mul(sub(2)) will print 3 (step1 : 2 – 1 = 1, step2 : 1 * 2 = 2, step3 : 2 + 1 = 3).

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