



**National University**  
of computer and emerging sciences

**SOFTWARE QUALITY ENGINEERING**

**ASSIGNMENT #2 REPORT**

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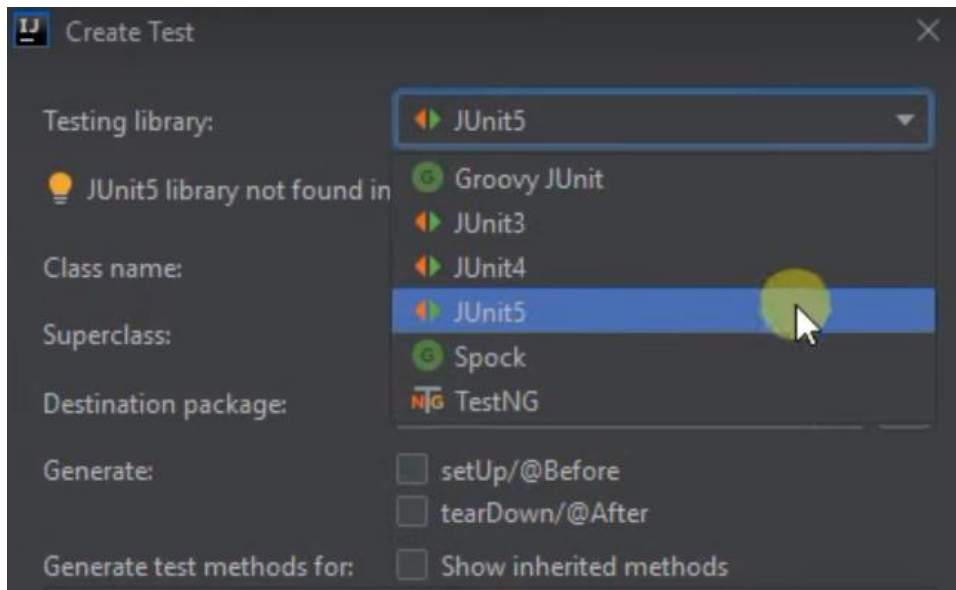
## JUNIT5 TESTING FOR FUNCTIONAL PROGRAM

In this program I made a basic calculator program where it takes two input. There are total of 4 function “ which return the value of the given input number according to the function called

```
class calculator{
    no usages
    double a;
    no usages
    double b;
    2 usages
    double add(double a, double b) { return a + b; }
    2 usages
    double subtract(double a, double b) {
        return a - b;
    }
    2 usages
    double multiply(double a, double b) {
        return a * b;
    }
    3 usages
    double divide(double a, double b) {
        if (b != 0) {
            return a / b;
        } else {
            System.out.println("Error: Cannot divide by zero.");
            return Double.NaN;
        }
    }
}
```

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Firstly we have to configure the JUnit 5 with our program so we did. You can see below

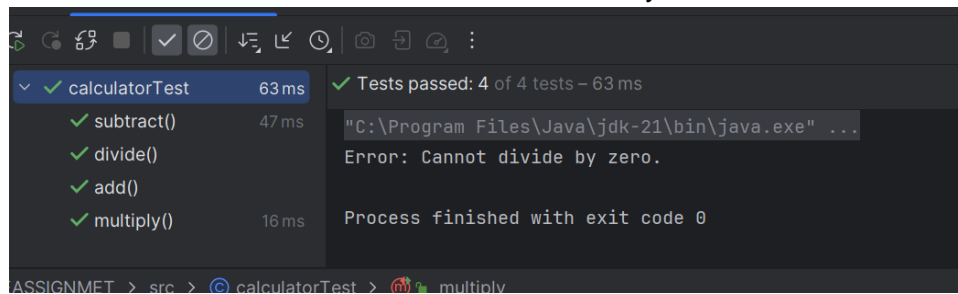


The below code performs junit5 testing for the above program. I pass the value “35” and “29” for all the function then compare the expected result by using “assertEquals” function which compares the expected result with given input.

```
import ...
class calculatorTest {
    @Test
    void add() {
        calculator obj=new calculator();
        assertEquals( expected: 64,obj.add( a: 35, b: 29));
    }
    @Test
    void subtract() {
        calculator obj=new calculator();
        assertEquals( expected: 6,obj.subtract( a: 35, b: 29));
    }
    @Test
    void multiply() {
        calculator obj=new calculator();
        assertEquals( expected: 1015,obj.multiply( a: 35, b: 29));
    }
    @Test
    void divide() {
        calculator obj=new calculator();
        assertEquals( expected: (double) 35 /29,obj.divide( a: 35, b: 29));
        assertEquals(Double.NaN,obj.divide( a: 35, b: 0));
    }
}
```

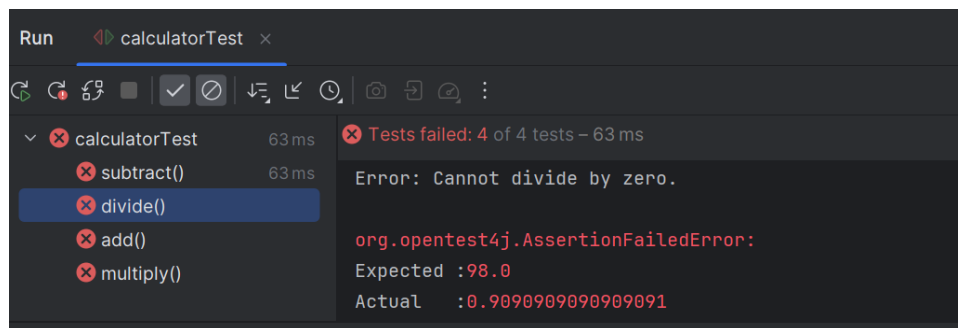
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After we run the test Cases and it runs successfully of all the four Function



### For Invalid value:

Here I change the expected value to "98" so after running this test case It shows the Failure.



## JUNIT TESTING FOR CONDITIONAL PROGRAM

I crete a Java program that applies discounts based on different conditions. In this example, I'll use a clothing store as a scenario, and the discount will be applied based on the type of clothing and the total purchase amount.

1. If the purchase amout is greater than 100 then it applies 20 Dollar discount.
2. If the purchase amout is greater than 100 also it purchases Shirt then it applies 30 Dollar discount.
3. If the purchase amout is greater than 100 also it purchases Pants then it applies 35 Dollar discount.
4. If none of the condition applies it will apply 5 dollar discount

```

1 usage
public class Discount {
    1 usage
    public static double calculateDiscount(String clothingType, double purchaseAmount) {
        double discount = 0.0;
        if (purchaseAmount > 100) {
            discount += 20; // $20 discount
        }
        if (clothingType.equalsIgnoreCase( anotherString: "shirt")) {
            discount += 10; // $10 discount for shirts
        }
        if (purchaseAmount > 50 && clothingType.equalsIgnoreCase( anotherString: "pants")) {
            discount += 15; // $15 discount for pants
        }
        if (discount == 0) {
            discount += 5; // $5 discount as a default
        }
        return discount;
    }
}

```

## JUnit5 Test Cases For the Above Code:

Making all the possible test cases and it runs succesfully

```

import ...

class DiscountTest {

    @Test
    void calculateDiscount() {
        Discount obj=new Discount();
        assertEquals( expected: 30,obj.calculateDiscount( clothingType: "shirt", purchaseAmount: 120));
        assertEquals( expected: 35,obj.calculateDiscount( clothingType: "pants", purchaseAmount: 120));
        assertEquals( expected: 5,obj.calculateDiscount( clothingType: "joggers", purchaseAmount: 85));
    }
}

```

DiscountTest x

countTest 51ms ✓ Tests passed: 1 of 1 test - 51 ms

calculateDiscount() 51ms "C:\Program Files\Java\jdk-21\bin\java.exe" ...

Process finished with exit code 0

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Invalid expected Value:

