Practical 4

Software Testing and Quality Assurance

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AIM : To study and perform sample tests using JUNIT Test Tool.

- JUnit is a unit testing framework for the Java programming language. JUnit has been important in the development of test-driven development, and is one of a family of unit testing frameworks which is collectively known as xUnit that originated with SUnit. JUnit is linked as a JAR at compile-time.
- JUnit is an open-source testing framework for Java programmers. To perform unit testing, we need to create test cases. The unit test case is a code which ensures that the program logic works as expected.

➢ Types of Unit Testing :

There are two ways to perform unit testing: 1) Manual testing 2) Automated testing.

1) Manual Testing : If we execute the test cases manually without any tool support, it is known as manual testing. It is time consuming and less reliable.
2) Automated Testing : If we execute the test cases by tool support, it is known as automated testing. It is fast and more reliable.

➢ Why we need JUnit testing :

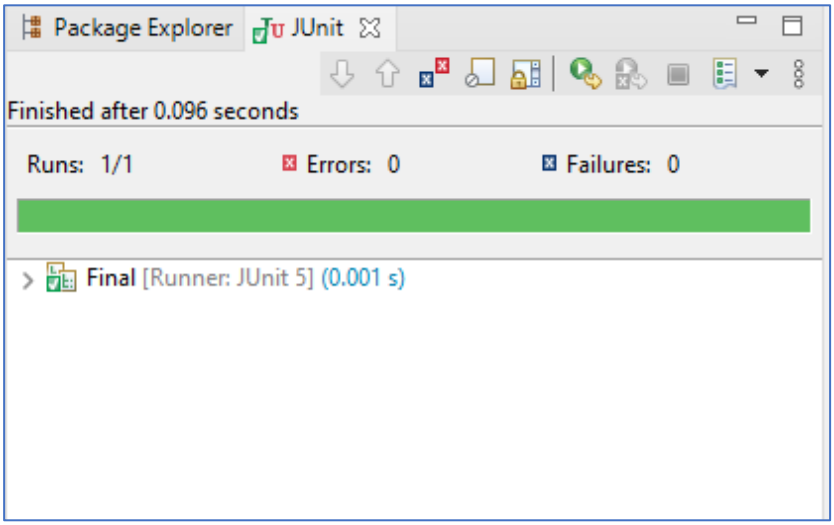
- It finds bugs early in the code, which makes our code more reliable.
- JUnit is useful for developers, who work in a test-driven environment.
- Unit testing forces a developer to read code more than writing.
- We develop more readable, reliable and bug-free code which builds confidence during development.
- Using JUnit we can save testing time.
- In real time, in the web application development we implement JUnit test cases in the DAO classes. DAO classes can be tested with out server.
- With JUnit we can also test Struts / Spring applications but most of the time we test only DAO classes. Even some times service classes also tested using JUnit.

Code:

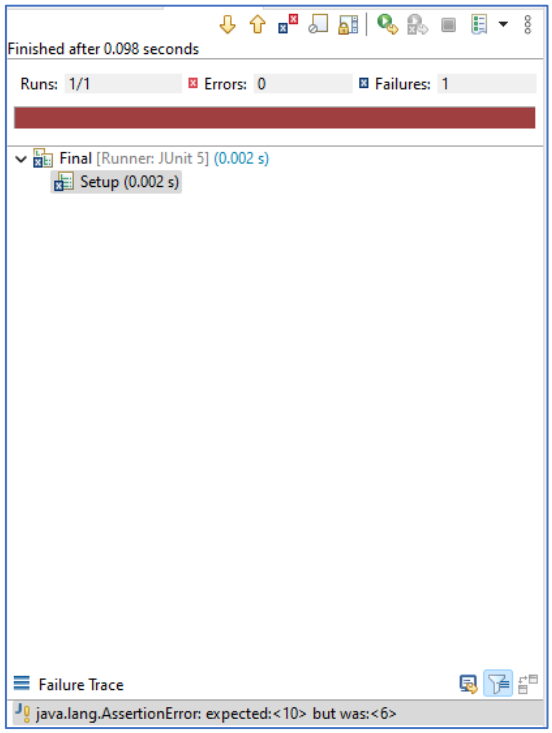
```
package junit;
import static org.junit.Assert.assertEquals;
import java.util.StringTokenizer;
import org.junit.Test;

public class Final {
	public static int findMax(int arr[]){
		int max=0;
		for(int i=1;i<arr.length;i++){
			if(max<arr[i])max=arr[i];
		}
		return max;
	}
	public static int findCube(int n){
		return n*n*n;
	}

	public static String reverseOfWords(String str){
		StringBuilder result=new StringBuilder();
		StringTokenizer tokenizer=new StringTokenizer(str," ");
		while(tokenizer.hasMoreTokens()){
			StringBuilder sb=new StringBuilder();
			sb.append(tokenizer.nextToken());sb.reverse();
			result.append(sb);result.append(" ");
		}
		return result.toString();
	}

	public int multiply(int a, int b) {
		return a * b;
	}
	@Test
	public void Setup()
	{
		assertEquals(4,findMax(new int[]{1,3,4,2}));
		assertEquals(1,findMax(new int[]{-12,1,-3,-4,-2})); assertEquals("erahK hsuytarP
		",reverseOfWords("Unnat Mistry"));assertEquals(27,findCube(3));
		assertEquals(10,multiply(2,5));
	}
}
```

Output:

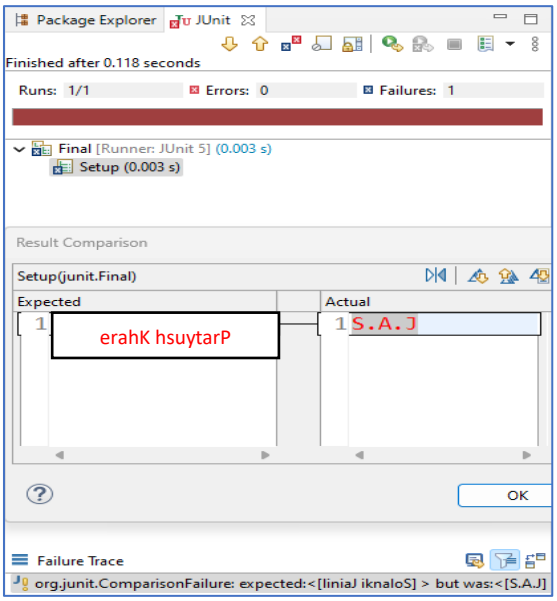
Test Case 1: All True



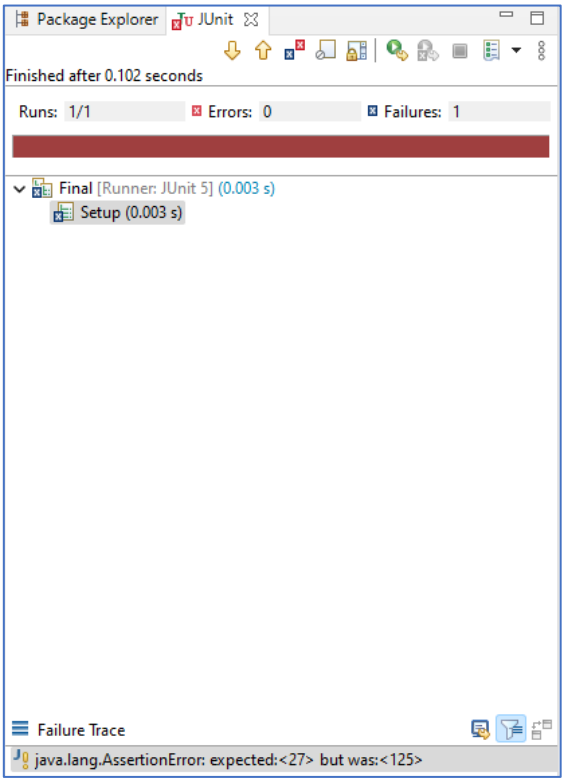
Test Case 2: Changing value of multiply function parameters to 2, 3.



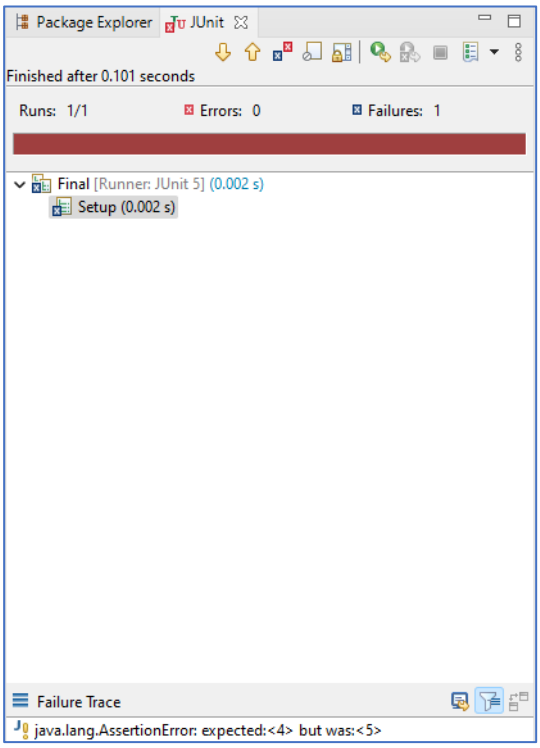
Test Case 3: Changing value of reverseOf Words function parameters toJ.A.S.



Test Case 4: Changing value of findCube function parameters to 5.



Test Case 5: Changing value of findMax function parameters to [4,3,5,2]



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