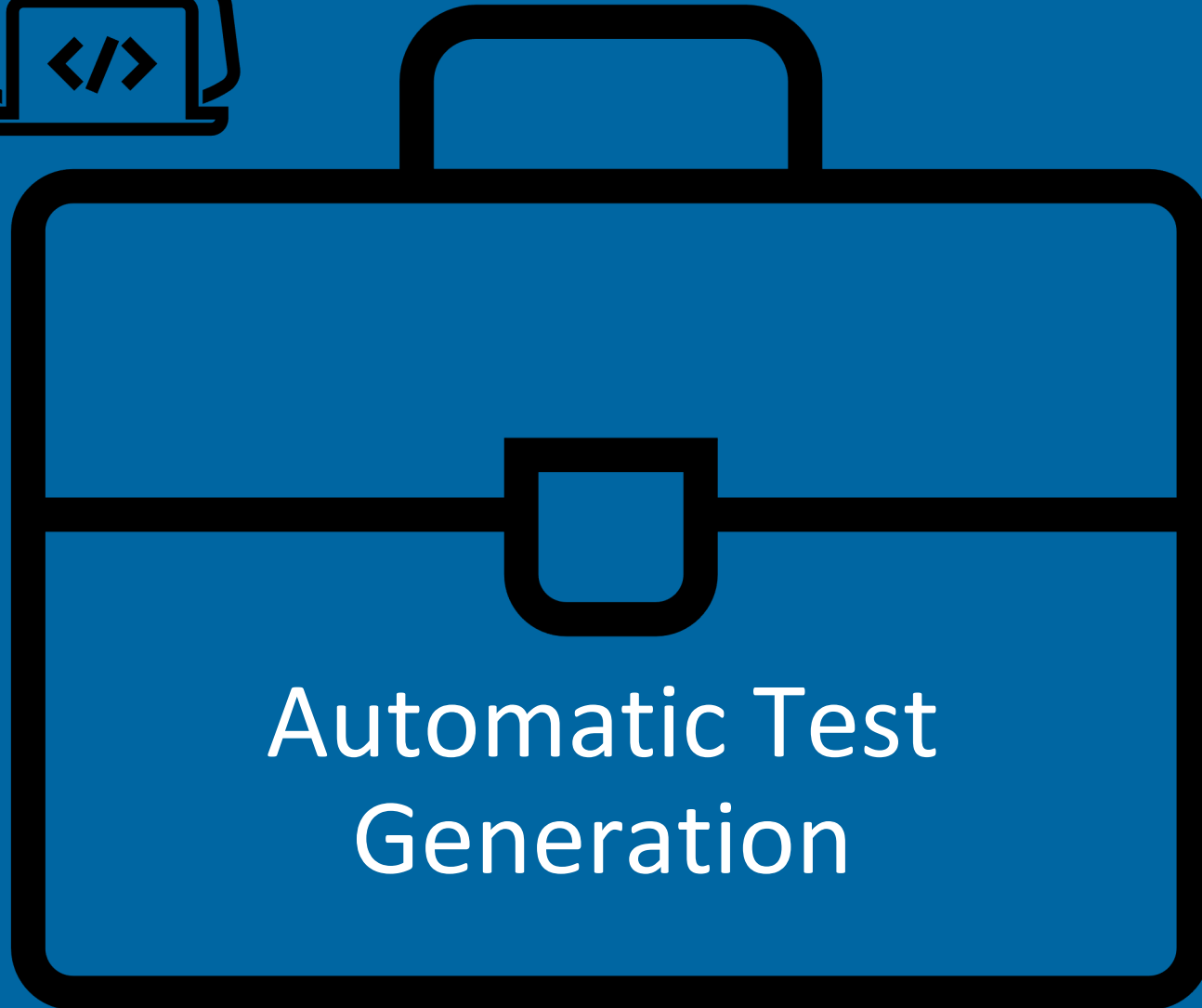
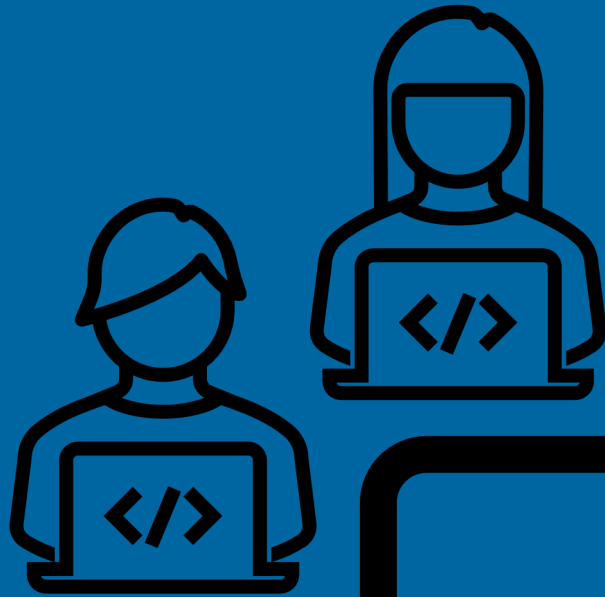
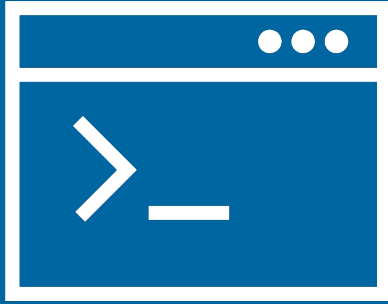


# Just-In-Time Test Generation

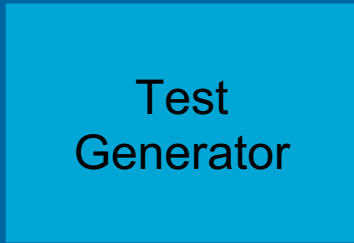
Carolin Brandt — [c.e.brandt@tudelft.nl](mailto:c.e.brandt@tudelft.nl)



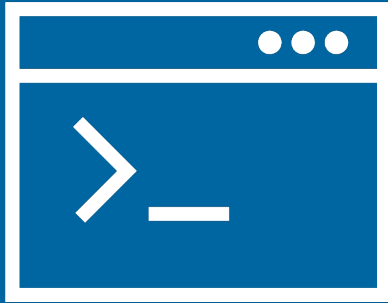
Automatic Test  
Generation



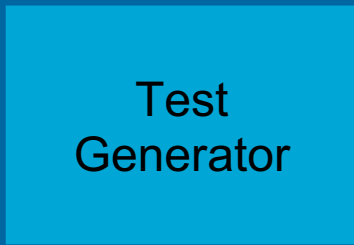
Code



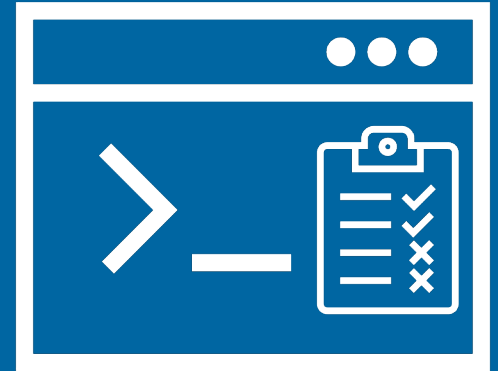
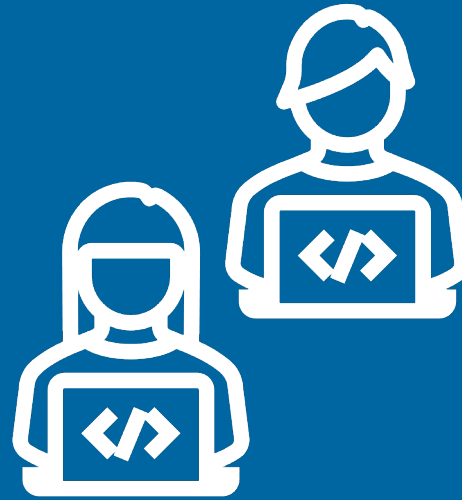
Tests



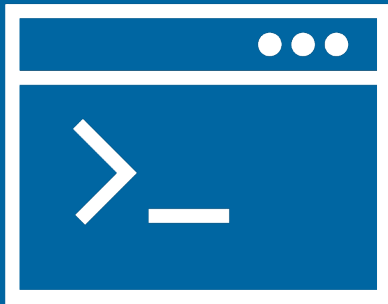
Code



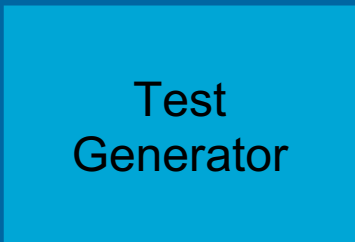
Tests



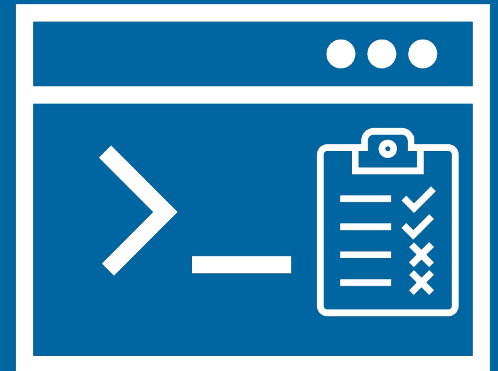
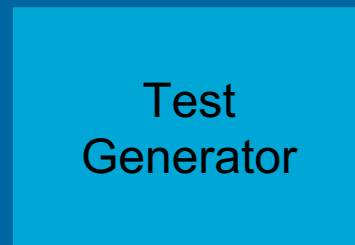
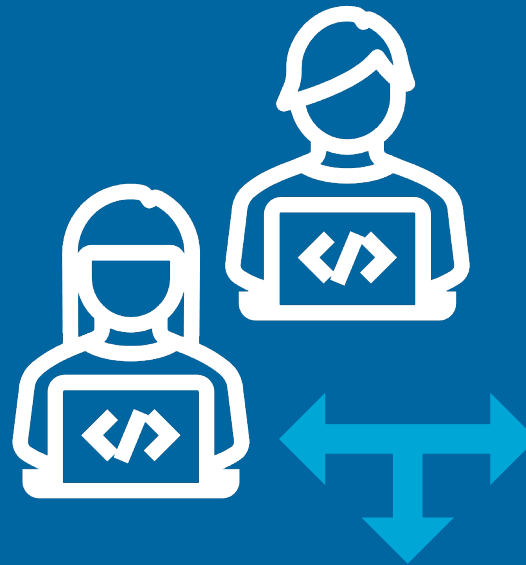
Code + Tests



Code



Tests



Code + Tests



```
public class A {  
    ...  
  
    String doX(int z) {  
        ...  
        if (this.y == 5) {  
            this.z = z + 7;  
            return "+7!";  
        }  
        ...  
    }  
    ...  
}
```

Hey! We have a new test for you that checks that "+7!" is returned when y is 5.

```
public class A {  
    ...  
  
    String doX(int z) {  
        ...  
        if (this.y == 5) {  
            this.z = z + 7;  
            return "+7!";  
        }  
        ...  
    }  
    ...  
}
```

```
public class ATest {  
    ...  
  
    @Test  
    void testDoXWhenYIsFive() {  
        A a = new A();  
        a.setY(5);  
        String s = a.doX(3);  
        assertEquals(s, "+7!");  
        assertEquals(a.getZ(), 10);  
    }  
}
```

Hey! We have a new test for you that checks that "+7!" is returned when y is 5.



Detect

Coherent Changes

Test-worthy Scenario

```
String doX(int z) {  
    ...  
    if (this.y == 5) {  
        this.z = z + 7;  
        return "+7!";  
    }  
    ...  
}  
...  
}
```

Detect

Coherent Changes

Test-worthy Scenario

Test Generation

Test Level

```
public class ATest {  
    ...  
  
    @Test  
    void testDoXWhenYIsFive() {  
        A a = new A();  
        a.setY(5);  
        String s = a.doX(3);  
        assertEquals(s, "+7!");  
        assertEquals(a.getZ(), 10);  
    }  
    ...  
}
```

Detect

Coherent Changes

Test-worthy Scenario

Test Generation

Test Level

Interactive Speed

Test Amplification

Trigger Target Condition

```
public class ATest {  
    ...  
  
    @Test  
    void testDoXWhenYIsFive() {  
        A a = new A();  
        a.setY(5);  
        String s = a.doX(3);  
        assertEquals(s, "+7!");  
        assertEquals(a.getZ(), 10);  
    }  
    ...  
}
```

Detect

Coherent Changes

Test-worthy Scenario

Test Generation

Test Level

Interactive Speed

Test Amplification

Trigger Target Condition

Build to Execute

Coverage, Mutation Score

```
public class ATest {  
    ...  
  
    @Test  
    void testDoXWhenYIsFive() {  
        A a = new A();  
        a.setY(5);  
        String s = a.doX(3);  
        assertEquals(s, "+7!");  
        assertEquals(a.getZ(), 10);  
    }  
    ...  
}
```

Detect

Coherent Changes

Test-worthy Scenario

How Much To Automate?

Developer-provided Oracle

...

Test Generation

Test Level

Interactive Speed

Test Amplification

Trigger Target Condition

Build to Execute

Coverage, Mutation Score

```
@Test
```

```
void testDoXWhenYIsFive() {
```

```
    A a = new A();
```

```
    a.setY(5);
```

```
    String s = a.doX(3);
```

```
    assertEquals(s, "<please fill!>");
```

```
    assertEquals(a.getZ(), <please fill>);
```

```
}
```

```
...
```

```
}
```

Detect

Coherent Changes

Test-worthy Scenario

How Much To Automate?

Developer-provided Oracle

Test Generation

Test Level

Interactive Speed

Test Amplification

Trigger Target Condition

Build to Execute

Coverage, Mutation Score

Interaction

When to Notify

Information to Provide

Adaptation to Project

Hey! We have a new test for you that checks that "+7!" is returned when y is 5.

Detect

Coherent Changes

Test-worthy Scenario

How Much To Automate?

Developer-provided Oracle

Test Generation

Test Level

Interactive Speed

Test Amplification

Trigger Target Condition

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Coverage, Mutation Score

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Opinions? write me!

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