

Spending less time bug fixing by
spending more time unit testing

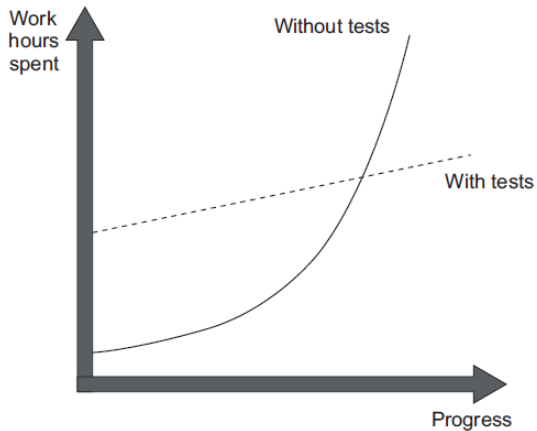
<Name>

There's much more to unit testing than the act of writing tests.

—*Khorikov, Unit Testing Principles, Practices, and Patterns*, 3

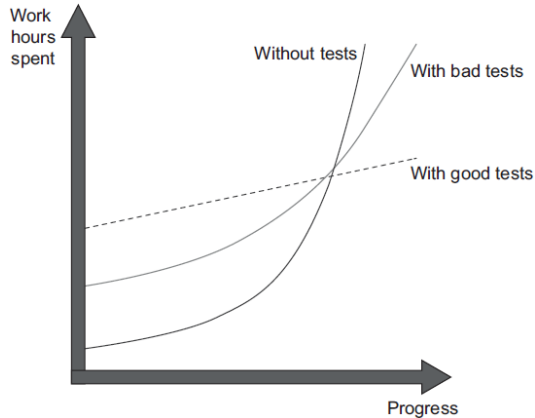
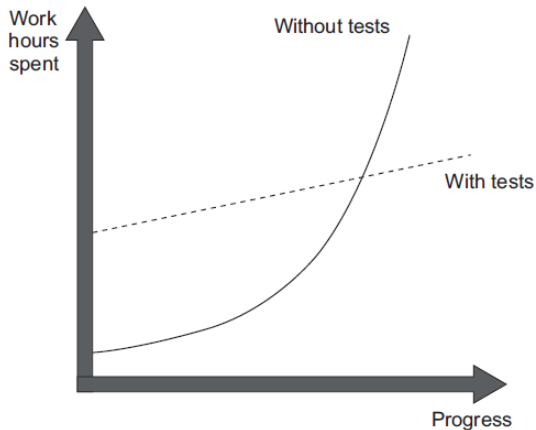
The goal of unit testing

To enable **sustainable** growth of software project.



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To enable **sustainable** growth of software project.



Coverage metrics

Statement vs Branch vs Path vs Condition

```
1 def is_fizzbuzz(num: int) -> bool:
2     if num % 3 and num % 5:
3         return True
4     return some_var
5
6 def test_fizzbuzz():
7     result = is_fizzbuzz(3)
8     assert result
```

$$\frac{\text{Number of statements executed}}{\text{Total number of statements}} \approx 67\%$$

Coverage metrics

Statement vs Branch vs Path vs Condition

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4 def test_fizzbuzz():
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```

$$\frac{\text{Number of statements executed}}{\text{Total number of statements}} = 100\%$$

Coverage metrics

Statement vs Branch vs Path vs Condition

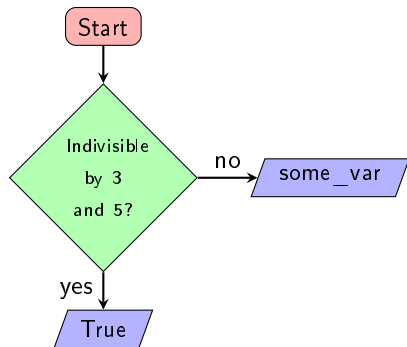
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4 def test_fizzbuzz():
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```

$$\frac{\text{Branches traversed}}{\text{Total number of branches}} = 50\%$$

Coverage metrics

Statement vs Branch vs Path vs Condition

```
1 def is_fizzbuzz(num: int) -> bool:  
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5     result = is_fizzbuzz(3)  
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```



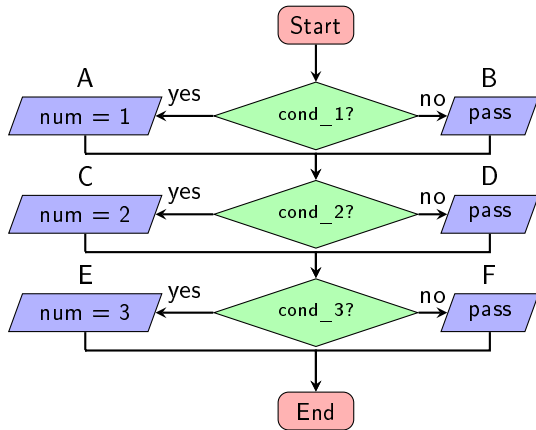
Coverage metrics

Statement vs Branch vs **Path** vs Condition

```
1 def generate_number(  
2     cond_1: bool = True,  
3     cond_2: bool = True,  
4     cond_3: bool = True,  
5 ) -> int:  
6     if cond_1:  
7         num = 1  
8     if cond_2:  
9         num = 2  
10    if cond_3:  
11        num = 3  
12    return num
```

Possible paths:

ACE, ACF, ADE, ADF, BCE, BCF, BDE, BDF



Coverage metrics

Statement vs Branch vs Path vs Condition

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```

num % 3	num % 5	num % 3 and num % 5
True	True	True
True	False	False
False	True	False
False	False	False

[C]overage metrics are a good negative indicator, but a bad positive one.

—Khorikov, *Unit Testing Principles, Practices, and Patterns*, 15