

PROPERTY BASED TESTING

PROPER



Recipe

- ▶ Fish
- ▶ Potatoes
- ▶ Onion
- ▶ Beets
- ▶ Carrots
- ▶ Mayo

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1. What is PropEr?
2. What is a property?
3. Three type of properties.
4. Demo.
5. Questions.
6. How to learn proper?
7. Links.

1. WHAT IS PROPER?

PropEr

Tool for testing Erlang programs automatically.

Property

Observation that we expect to hold true regardless of the program's inputs.

2. WHAT IS A PROPERTY?

Property example...

... outputs a positive number

Property example...

- ... outputs a positive number
- ... preserves list length

Property example...

- ... outputs a positive number
- ... preserves list length
- ... matches the output of another

To test a system:

- A. Programmer writes properties.
- B. PropEr attempts to generate test cases that falsifies them.

3. THREE TYPES OF PROPERTIES

How to come up with a property?

1. Modeling

Model the system and ensure system behaves just like the model.

`biggest(list) == last(sort(list))`

SYSTEM

MODEL

2. Alternative description of system's behaviour

“In a *sorted list*, any element is greater than all those that precede it and lesser than all those that follow.

3, 5, 8, 10, 14, 22

3. Symmetric operations

Find an inverse of the what the system is doing.

$$a == \text{decode}(\text{encode}(a))$$

INVERSE

SYSTEM

String Splitter

SPLIT: “pbv@dcc.fc.up.pt”

AROUND: ‘@’

AROUND: “pbv”, “dcc.fc.up.pt”

5. QUESTIONS



Learning progression

1. Work through official [tutorial](#)
2. Inspect APIs: [proper](#) and [proper_types](#)
3. Write a few of your own tests
4. Read Fred Herbert's [PropEr Testing](#)

Useful links

Implies vs. Suchthat

<https://stackoverflow.com/questions/36464917/suchthat-vs-implies-in-quickcheck>

Default generators reference

[http://proptesting.com/
book_stateless_properties.html#_default_generators](http://proptesting.com/book_stateless_properties.html#_default_generators)

Restricting generators to some subset

[http://proptesting.com/
book_custom_generators.html#_restricting_generators](http://proptesting.com/book_custom_generators.html#_restricting_generators)

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THANK YOU