

ActiveState

It's properties all the way down!

Narrowing in on a property test's input space.

@shnewto

~~It's properties all the way down!~~

Unit test:
1 input scenario

```
addUnitTests : Test
addUnitTests =
  describe "some add tests"
    [ test "commutative property" <|
      | \_ ->
      |   add 1 2
      |   |> Expect.equal (2 + 1)
    ]
```

Property test:
“All” input scenarios

```
addPropTests : Test
addPropTests =
  describe "properties of addition"
  [ fuzz2 int int "commutative property" <|
    | \x y ->
      | add x y
      |> Expect.equal (y + x)
    ]
```

Step 1:
Have code

```
#define _IO_peek_unlocked(_fp)
    (_IO_BE((_fp)->_IO_read_ptr >= (_fp)->_IO_read_end, 0) && __underfl

#define _IO_putc_unlocked(_ch, _fp) \
    (_IO_BE((_fp)->_IO_write_ptr >= (_fp)->_IO_write_end, 0) \
     ? __overflow(_fp, (unsigned char)(_ch)) \
     : (unsigned char)*(_fp)->_IO_write_ptr++ = (_ch))

#if defined _LIBC || defined _GLIBCPP_USE_WCHAR_T
#define _IO_getwc_unlocked(_fp)
    (_IO_BE((_fp)->_wide_data == NULL || ((_fp)->_wide_data->_IO_read_p
     ? __wuflow(_fp) +
     : (_IO_wint_t) * (_fp)->_wide_data->_IO_read_ptr++))
#define _IO_putwc_unlocked(_wch, _fp)
    (_IO_BE((_fp)->_wide_data == NULL || ((_fp)->_wide_data->_IO_write
     ? __woverflow(_fp, _wch)
     : (_IO_wint_t)*(_fp)->_wide_data->_IO_write_ptr++ = (_wch)))
#endif
```


Step 2:

Write a toy property test

```
firstPropTest : Test
firstPropTest =
  describe "properties of list reversal"
  [ fuzz (list char) "reverse and reverse again!" <|
    \chars ->
      reverse (reverse chars)
    |> Expect.equal chars
  ]
```

...?

Step N:

You have a rich set of
property tests

This talk: Step 3

It's *fuzzes* all the way down!

```
#define _IO_peek_unlocked(_fp)
    (_IO_BE((_fp)->_IO_read_ptr >= (_fp)->_IO_read_end, 0) && __underfl

#define _IO_putc_unlocked(_ch, _fp) \
    (_IO_BE((_fp)->_IO_write_ptr >= (_fp)->_IO_write_end, 0) \
     ? __overflow(_fp, (unsigned char)(_ch)) \
     : (unsigned char)*(_fp)->_IO_write_ptr++ = (_ch))

#if defined _LIBC || defined _GLIBCPP_USE_WCHAR_T
#define _IO_getwc_unlocked(_fp)
    (_IO_BE((_fp)->_wide_data == NULL || ((_fp)->_wide_data->_IO_read_ptr
     ? __wuflow(_fp) +
     : (_IO_wint_t) * (_fp)->_wide_data->_IO_read_ptr++))

#define _IO_putwc_unlocked(_wch, _fp)
    (_IO_BE((_fp)->_wide_data == NULL || ((_fp)->_wide_data->_IO_write_ptr
     ? __woverflow(_fp, _wch)
     : (_IO_wint_t)*(_fp)->_wide_data->_IO_write_ptr++ = (_wch)))

#endif
```



WC

ls

locate

grep

“fuzzed” args:

[]

“fuzzed” args:
[‘ -h ’]

“fuzzed” args:
[‘ -h ’ , ‘ -v ’]









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Twitter: @shnewto

Blog: sheas.blog

GitHub: shnewto

Email: shnewto@gmail.com