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python
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MALAYSIA
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Console UI Library  http://excess.org/urwid/
Essential Details

High-level console user interface library for Python
LGPL
Unix-like OSes: Linux, OSX, (windows with Cygwin)
Urwid Development

http://www.ohloh.net/p/urwid/contributors

> 20 contributors over the course of the project

Mostly yours truly
About Myself

• Independent software developer
  http://genericconsulting.ca/
  Django, PostgreSQL, Python, C, ASM
• located near Ottawa, Canada
Urwid Users

http://excess.org/urwid/wiki/ApplicationList

~ 20 projects listed, including

- bpython
- wicd
- pudb
- reportbug
- speedometer
```python
def simple_func(x):
    x += 1

    s = range(20)
    z = None
    w = ()

    y = dict((i, i**2) for i in s)

    k = set(range(5, 99))

    try:
        x.invalid
    except AttributeError:
        pass

    #import sys
    #sys.exit(1)

    return 2*x

def fermat(n):
    """Returns triplets of the form x^n + y^n
    Warning! Untested with n > 2."
    """

* from itertools import count
```
>>> print 'Hello world'
Hello world
>>> for x in xrange(1,100):
    print x,
...
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70
 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99
>>> import sys
>>> sys.getdlopenflags()
2
>>> import os
>>> os.listdir '~/irclogs/tweakers/'

os.listdir: path
| tweakers  17net  Freenode  rid.py  Tweakers  stats.cfg |
Good Console Interfaces

Helps you write apps like: vim, mc, w3m, rtorrent, aptitude, tmux

Doesn't (yet) help you make silly ones (turbovision)

Goals

- Use the complete display area efficiently
- Sparse UI that stays out of your way
- Work well over ssh, even with high latency
- No particular GUI required, text console is fine
Alternatives

curses

- comes with python
- very low level

newt/snack

- some gui-like widgets

insults

- well integrated with twisted
Urwid

• > 7 years
• reached 1.0 in 2011
• supports Python 2.4-2.7, 3.2+
• good Unicode support
• friendly 256/88 colour support
• twisted/glib event loop support
• separation of concerns from the start
Console UI Library

http://excess.org/urwid/
The Reason Urwid Exists

I wanted to write a point of sale system

- Text Layout
- Input Handling
- Lists and Scrolling
Text Layout is Hard

Wrapping, alignment, clipping, double-width and zero-width characters

http://excess.org/urwid/wiki/TextLayout

- new data structure
  - maps 1d positions <-> 2d coordinates
- caching
- custom text layouts
- editing + cursor positioning
Input Handling is Hard

- curses doesn't work very well
  - many xterm key combinations unsupported
  - termcap / terminfo can't be fixed
- do it ourself
- minimize delay on ESC
- support all the key combinations I want
Lists and Scrolling are Hard

ListBox

- cursor key and page up/down handling
- relative focus position
- selectable/unselectable widgets

List Walker

- focus tracking
- widget content generation
Unicode is Hard

- extend text layout
- raw_display
Event Loops are Hard

MainLoop

• pass input from user to widgets
• draw widgets on the screen
• throttle screen resizing
• do the fast stuff first

Event Loops

• wait on IO
• timers
• notice when idle
Penultimate Slide

Consider making a console UI for your next app, even just as a second option. Contribute to OSS or build your own OSS project. Lots of work but it can be very satisfying.
Questions