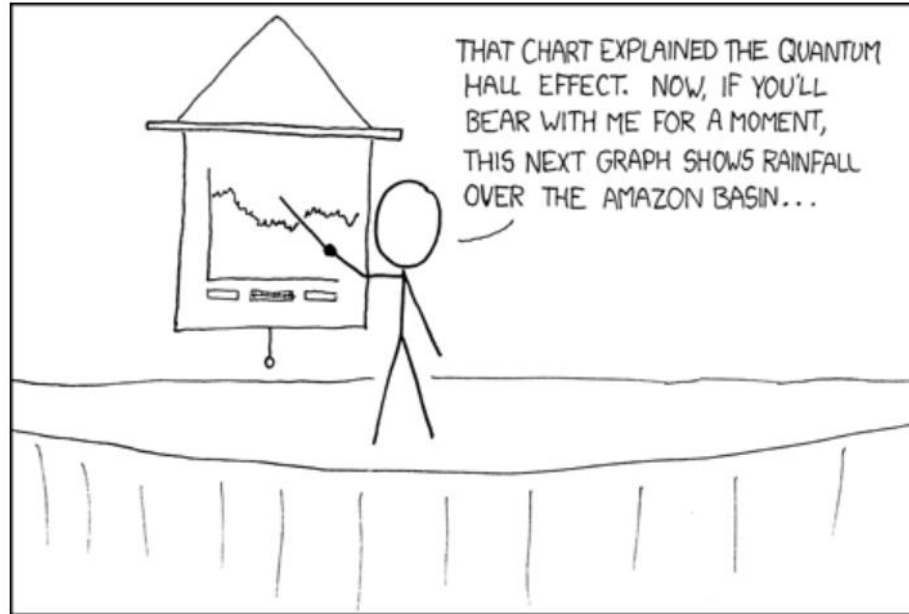


# It doesn't work!

André Roberge  
PyConAu 2021

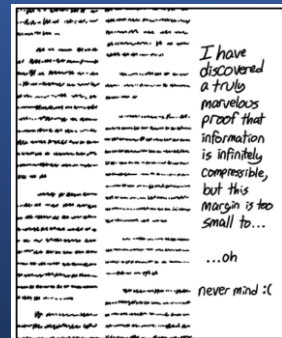


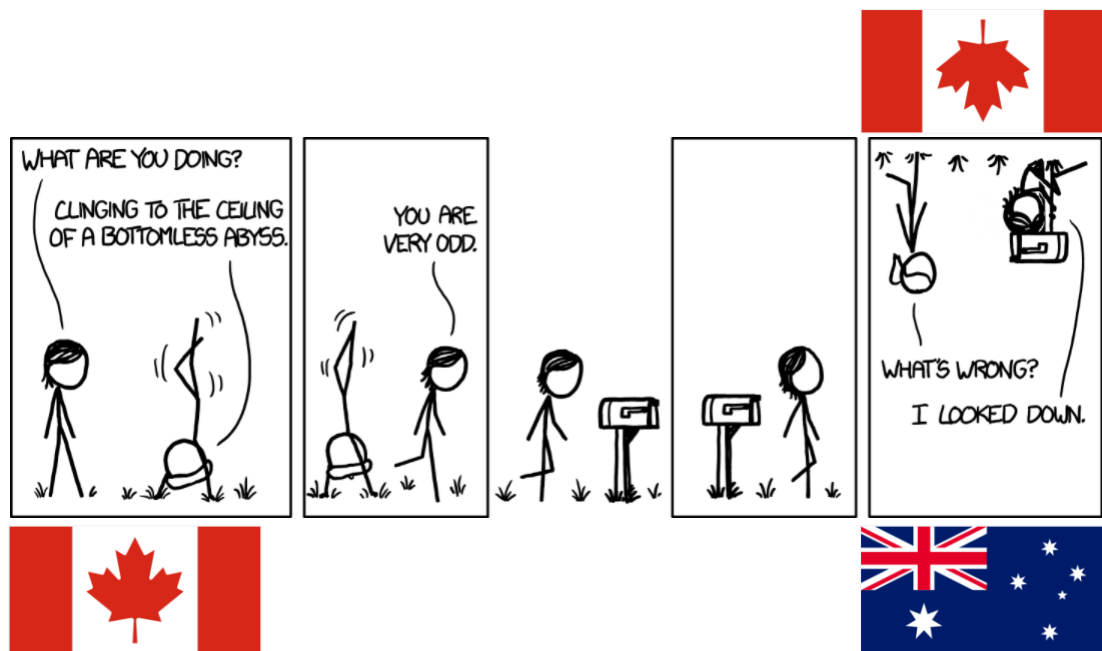
## SLIDES



IF YOU KEEP SAYING "BEAR WITH ME FOR A MOMENT",  
PEOPLE TAKE A WHILE TO FIGURE OUT THAT  
YOU'RE JUST SHOWING THEM RANDOM SLIDES.

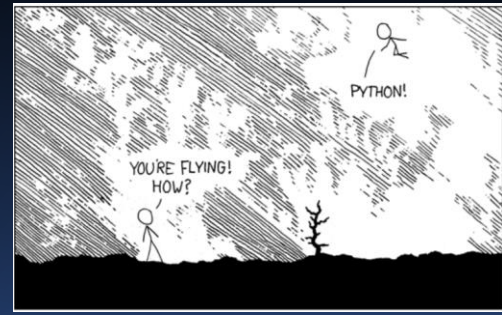
André Roberge  
PyConAu 2021





André Roberge  
PyConAu 2021

# You are a teacher (or mentor)



# Example 1

I LEARNED IT LAST  
NIGHT! EVERYTHING  
IS SO SIMPLE!  
HELLO WORLD IS JUST  
print "Hello, world!"



IDLE (Python 3.8)

Application

```
my_turtle.py - C:\Users\andre\github\talks\pycon_au-2021\my_turtle.py (3.8.4)
File Edit Format Run Options Window Help
# Draw a square

import turtle

def draw_square():
    for i in range(4):
        turtle.forward(100)
        turtle.left(90)

draw_square()
```

Ln: 11 Col: 0

# Example 1



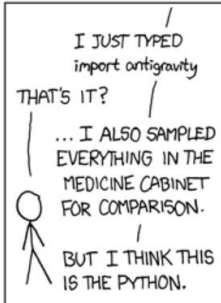
```
turtle.py - C:\Users\andre\github\talks\pycon_au-2021\turtle.py (3.8.10)
File Edit Format Run Options Window Help
# Draw
import

def draw_square():
    for i in range(4):
        turtle.forward(100)
        turtle.left(90)

draw_square()
```

Ln: 12 Col: 0

# Example 1



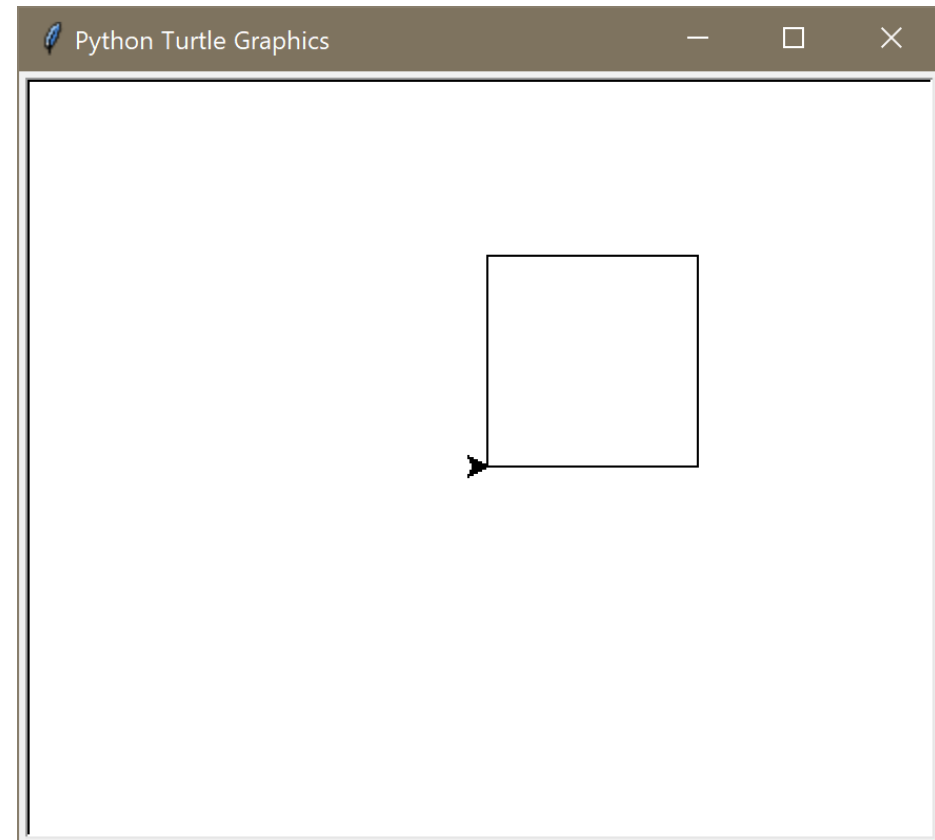
```
my_turtle.py - C:\Users\andre\github\talks\pycon_au-2021\my_turtle.py (3.8.4)
File Edit Format Run Options Window Help
# Draw a square

import turtle

def draw_square():
    for i in range(4):
        turtle.forward(100)
        turtle.left(90)

draw_square()

Ln: 11 Col: 0
```



# A student tries to reproduce this example



```
turtle.py - C:\Users\andre\github\talks\pycon_au-2021\turtle.py (3.8.10)
File Edit Format Run Options Window Help
# Draw a square

import turtle

def draw_square():
    for i in range(4):
        turtle.forward(100)
        turtle.left(90)

draw_square()
```

Ln: 12 Col: 0



```
Python 3.8.4 Shell
File Edit Shell Debug Options Window Help
Python 3.8.4 (tags/v3.8.4:dfa645a, Jul 13 2020, 16:30:28) [MSC v.1926 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:\Users\andre\github\talks\pycon_au-2021\turtle.py =====
Traceback (most recent call last):
  File "C:\Users\andre\github\talks\pycon_au-2021\turtle.py", line 3, in <module>
    import turtle
  File "C:\Users\andre\github\talks\pycon_au-2021\turtle.py", line 11, in <module>
    draw_square()
  File "C:\Users\andre\github\talks\pycon_au-2021\turtle.py", line 8, in draw_square
    turtle.forward(100)
AttributeError: partially initialized module 'turtle' has no attribute 'forward' (most likely
due to a circular import)
>>> |
```

Ln: 13 Col: 4

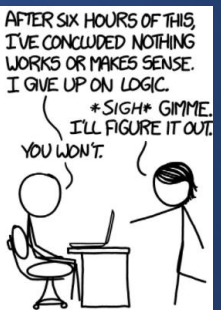
# It doesn't work!



```
Python 3.8.4 Shell
File Edit Shell Debug Options Window Help
Python 3.8.4 (tags/v3.8.4:dfa645a, Jul 13 2020, 16:30:28) [MSC v.1926 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:\Users\andre\github\talks\pycon_au-2021\turtle.py =====
Traceback (most recent call last):
  File "C:\Users\andre\github\talks\pycon_au-2021\turtle.py", line 3, in <module>
    import turtle
  File "C:\Users\andre\github\talks\pycon_au-2021\turtle.py", line 11, in <module>
    draw_square()
  File "C:\Users\andre\github\talks\pycon_au-2021\turtle.py", line 8, in draw_square
    turtle.forward(100)
AttributeError: partially initialized module 'turtle' has no attribute 'forward' (most likely
due to a circular import)
>>> |
```

- Too much **red**
- Too much jargon
  - Traceback, AttributeError, partially initialized module, circular import, ...

It doesn't work!



Could this be made more  
user-friendly?

```
Traceback (most recent call last):
```

```
File "turtle.py", line 3, in <module>
```

```
    import turtle
```

```
File "turtle.py", line 11, in <module>
```

```
    draw_square()
```

```
File "turtle.py", line 8, in draw_square
```

```
    turtle.forward(100)
```

```
AttributeError: partially initialized module 'turtle' has no attribute  
'forward' (most likely due to a circular import)
```

Did you give your program the same name as a Python module?

A bit less red ... and a hint.

#### UI CHANGE

UGH, I HATE WHEN APPS MAKE  
ARBITRARY CHANGES TO THEIR UI.  
STUFF I DO ALL THE TIME JUST  
GOT WAY HARDER FOR NO REASON!

MAN,  
YOU ARE NOT GOING  
LIKE GETTING OLD.



`AttributeError`: partially initialized module 'turtle' has no attribute 'forward' (most likely due to a circular import)

```
>>> what()
```

An `AttributeError` occurs when the code contains something like  
    `object.x`  
and `x` is not a method or attribute (variable) belonging to `object`.

what()

```
>>> where()
```

Execution stopped on line 3 of file turtle.py.

```
1: # Draw a square
-->3: import turtle
6: def draw_square():
```

Exception raised on line 8 of file turtle.py.

```
6: def draw_square():
7:     for i in range(4):
-->8:         turtle.forward(100)
9:         turtle.left(90)
```

global turtle: <module turtle> from turtle.py

where()


```
AttributeError: module 'turtle' has no attribute 'doesnotexist'
```

```
>>> where()
```

```
Exception raised on line 1 of file <friendly-console:6>.
```

```
-->1: turtle.doesnotexist(42)
```

```
      turtle: <module turtle> from PYTHON_LIB:\turtle.py
```



```
>>> import turtle
>>> turtle.__file__
'C:\\Users\\andre\\AppData\\Local\\Programs\\Python\\Python39\\lib\\turtle.py'
```

where()

```
>>> why()
```

I suspect that you used the name `turtle.py` for your program and that you also wanted to import a module with the same name from Python's standard library.  
If so, you should use a different name for your program.

why()





AttributeError: partially initialized module turtle has no attribute forward



Tout Images Vidéos Actualités Carte

Préférences ▼



Canada (fr) ▼

Filtre parental : modérée ▼

À tout moment ▼

AttributeError: partially initialized module 'turtle' has ...



<https://stackoverflow.com/questions/60480328/attributeerror-partially-initialized-mod...>

AttributeError: partially initialized module 'turtle' has no attribute 'Turtle' (most likely due to a circular import)

attributeerror: partially initialized module 'turtle' has ...



<https://stackoverflow.com/questions/65962607/attributeerror-partially-initialized-mod...>

AttributeError: partially initialized module 'turtle' has no attribute 'Turtle' (most likely due

www()

#### WISDOM OF THE ANCIENTS

NEVER HAVE I FELT SO  
CLOSE TO ANOTHER SOUL  
AND YET SO HELPLESSLY ALONE.  
AS WHEN I GOOGLE AN ERROR  
AND THERE'S ONE RESULT  
A THREAD BY SOMEONE  
WITH THE SAME PROBLEM  
AND NO ANSWER  
LAST POSTED TO IN 2003

WHO WERE YOU,  
DENVERCODER??  
WHAT DID YOU SEE?!

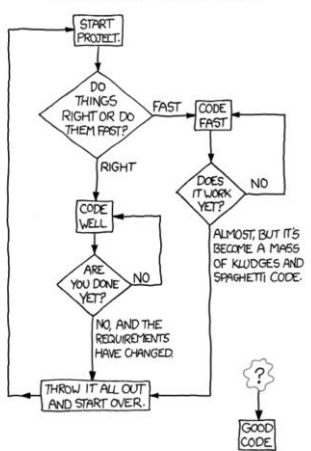


This is  
possible using  
friendly

friendly

friendly\_traceback

HOW TO WRITE GOOD CODE:



# flipflopoperator



PyCon AU @PyConAU · 21 juin 2019

At PyConAU 2018 we learned about an obscure Ruby feature which inspired a surprising number of mid-conference Python implementations.

If you hear references to a "flipflopoperator" here's where it all began! 🤔

[youtube.com/watch?v=BmWLhV...](https://youtube.com/watch?v=BmWLhV...)

Thanks @merxplat

```
def bobo_nickname_finder(phrase):
    name = []
    phrase = phrase.replace('.', '').replace(',', '')
    for word in phrase.split():
        if ..(word == 'Monsieur', word == 'Bobo'):
            name.append(word)
    return ' '.join(name)
bobo_nickname_finder('''
I have had a great day with this large boy, Monsieur Bobo.
You may also know him as Monsieur 'Chonky' Bobo, or Monsieur
'Loves to Eat the Food' Bobo.
''')
```



# flipflopoperator

```
Traceback (most recent call last):  
  File "flipflopoperator.py", line 8, in <module>  
    bobo_nickname_finder(''  
  File "flipflopoperator.py", line 5, in bobo_nickname_finder  
    if ..(word == 'Monsieur', word == 'Bobo'):  
NameError: name '..' is not defined
```

You must be a fan of PyConAu!



# flipfloperator

  
**flipfloperator 0.1.2**  
[pip install flipfloperator](#) 

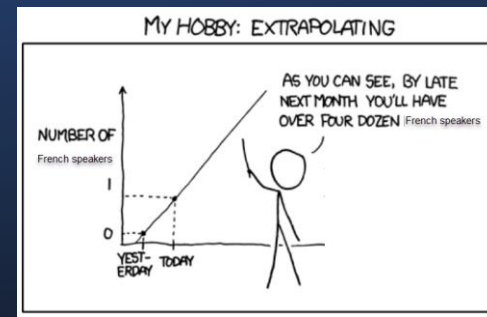
```
>>> why()
```

I am guessing that you tried to use (one of) the flipflooperators shown during the second Lightning Talk session of PyConAu 2018, but that you forgot to import the module from PyPI.

Note that it is still a bad idea.

```
>>> |
```

# flipflopoperator



```
>>> set_lang('fr') # Monsieur Bobo
>>> why()
```

Je suppose que vous avez essayé d'utiliser l'un des flipflopoperators présentés lors de la deuxième session Lightning Talk de PyConAu 2018, mais que vous avez oublié d'importer le module de PyPI.

**Notez que c'est toujours une mauvaise idée.**

# Outline of the rest of this talk

Original purpose of friendly-traceback

Evolution of friendly/friendly-traceback

- Suggestions made
- Various examples
  - HackInScience site
  - Mu
  - Jupyter Notebooks

Justification after the fact

Conclusion

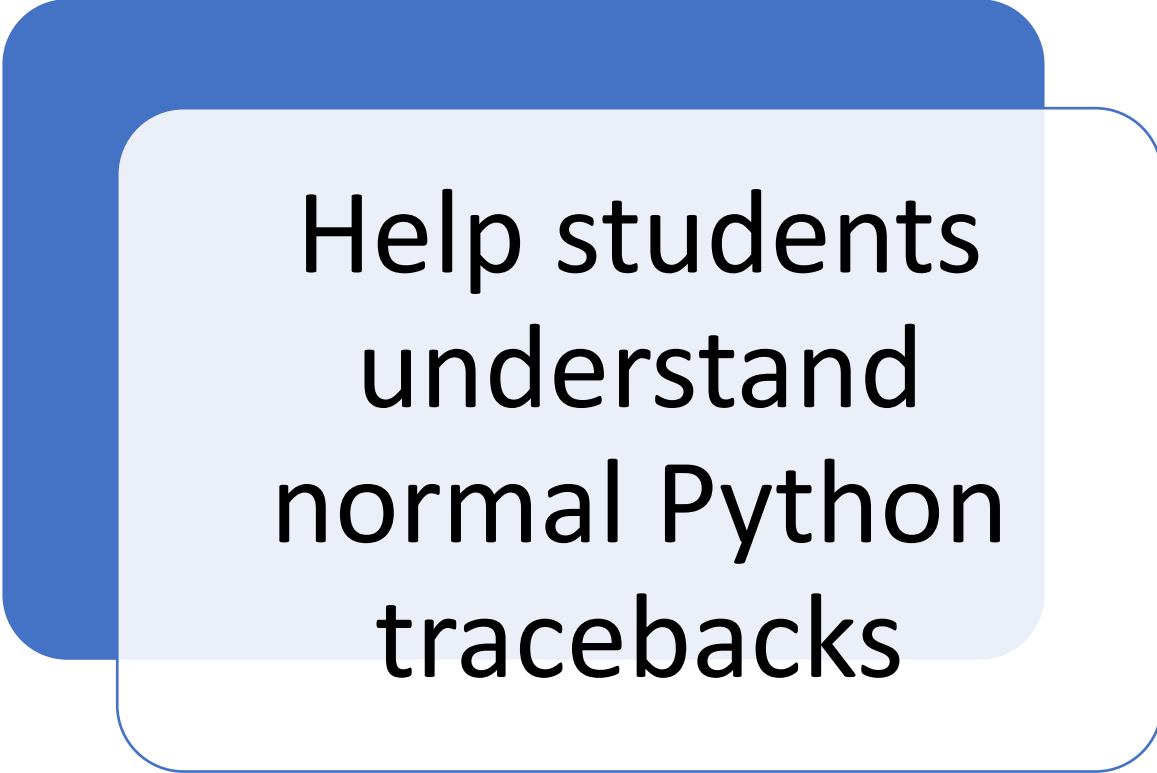
# Purpose of this talk

- Motivate you to use friendly with your students.
- Encourage CS Education experts to critically evaluate friendly.
- Motivate you to give me feedback to improve friendly.





# Original purpose of friendly-traceback



Help students  
understand  
normal Python  
tracebacks

# Original purpose of friendly-traceback

Provide accurate and easy to understand explanations for as many sources of Python exceptions as possible.

Translate these explanations in as many languages as possible.

Tuesday, June 04, 2019

# Abolishing `SyntaxError: invalid syntax ...`

... and other cryptic messages.

# Newcomers copy/pasting from repl #52



JulienPalard opened this issue on 25 Jul 2020 · 8 comments



JulienPalard commented on 25 Jul 2020 • edited ▼

I see a lot of:

```
Traceback (most recent call last):
  File "solution.py", line 1
    >>>print("Hello World!")
    ^
SyntaxError: invalid syntax
```

[idea] Propose near matches on attribute error. #62



JulienPalard opened this issue on 28 Jul 2020 · 3 comments




JulienPalard commented on 28 Jul 2020

You probably misstyped `'ascii_lowercase'` (you typed `'ascii_lowecase'`).

Before July 2021

Now, two  
projects

 [aroberge / friendly](#)

 Unwatch ▾

10

 Star

322

 [friendly-traceback / friendly](#)


 Unwatch ▾

1


 Star

0

 [friendly-traceback / friendly-traceback](#)


 Unwatch ▾

1


 Star

5

 [friendly-traceback / docs](#)

 Unwatch ▾

1

 Star

0

#### STAR RATINGS

UNDERSTANDING ONLINE STAR RATINGS:

★★★★★ [HAS ONLY ONE REVIEW]

★★★★★ EXCELLENT

★★★★★ OK

★★★★★

★★★★★

★★★★★ CRAP

★★★★★

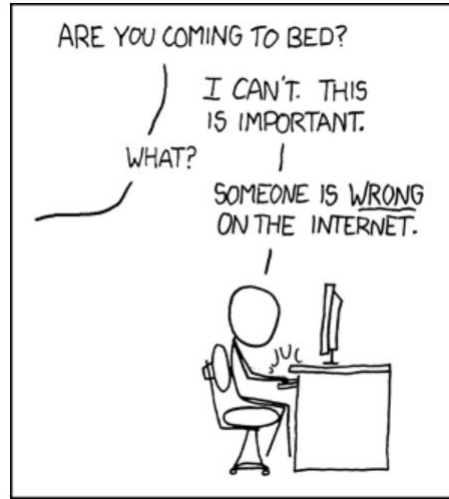
★★★★★

Approach used: examples added one at a time

- General
  - Did you give your program the same name as a Python module?
- A few rare specialized cases
  - Using the flipfloperator ... is still a bad idea
- Version 0.4.0: approximately 300 individual cases of SyntaxError and various runtime errors.

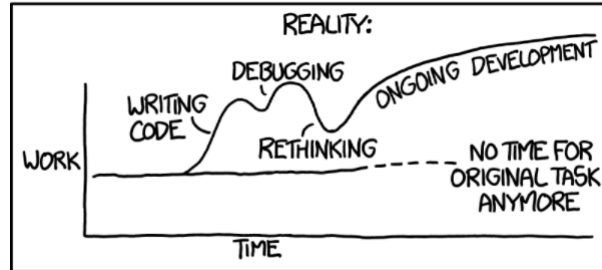


MY PACKAGE MADE IT INTO DEBIAN-MAIN BECAUSE IT LOOKED INNOCUOUS ENOUGH; NO ONE NOTICED "LOCUSTS" IN THE DEPENDENCY LIST.

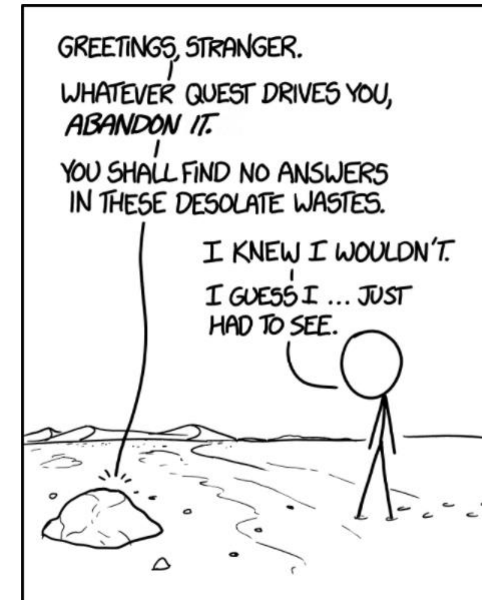


CS WILL MAKE EACH DAY A QUEST TO FIND A MISSING CLOSE-PAREN.

(((((X))))(X))  
))))(X))((X))

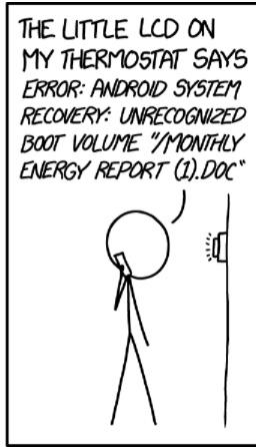
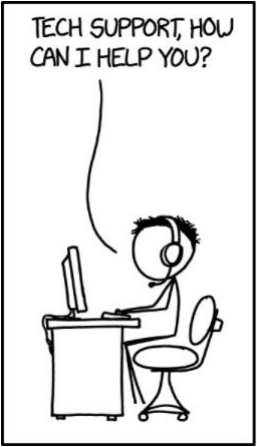


## SECOND

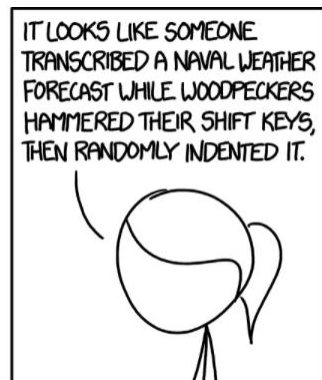
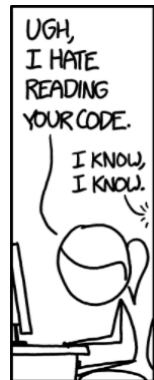
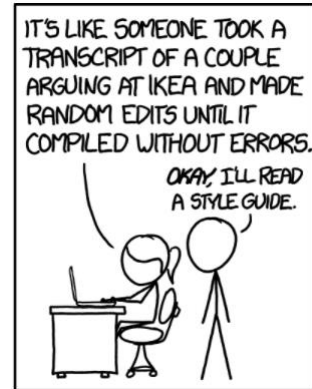
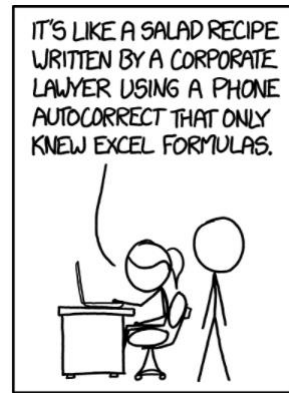
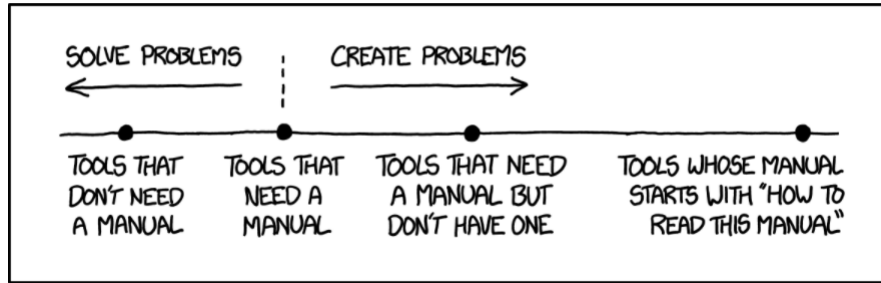


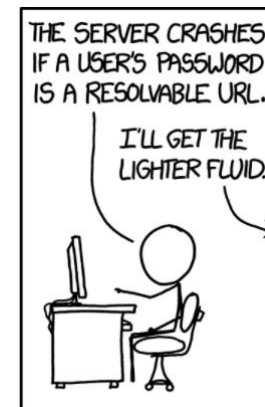
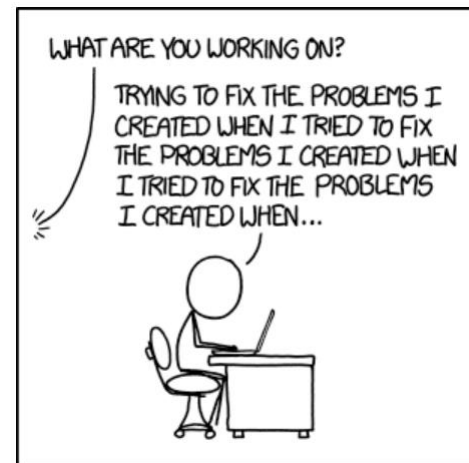
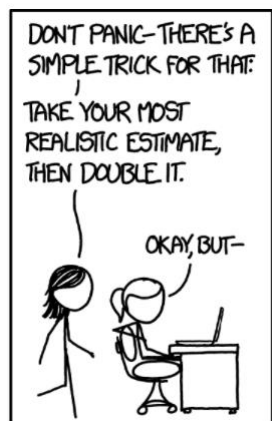
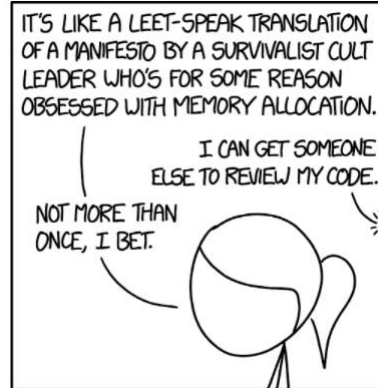
I HATE FEELING DESPERATE ENOUGH TO VISIT THE SECOND PAGE OF GOOGLE RESULTS.





## MANUALS





# Suggestion from Julien Palard

- Copy pasted text
- Do it on HackInScience

<https://friendly-traceback.github.io/docs/index.html>

```
>>> import turtle  
>>> p = Pen()
```

```
Traceback (most recent call last):
```

```
  File "<friendly-console:2>", line 1, in <module>  
    p = Pen()
```

```
NameError: name 'Pen' is not defined
```

```
Did you mean len? Did you forget to add turtle.?
```

Do this example using Jupyter notebooks or Mu.

Did you mean `len`? Did you forget to add `turtle.`?

```
>>> why()
```

In your program, no object with the name `Pen` exists. The Python builtin `len` has a similar name.

The local object `turtle` has an attribute named `Pen`. Perhaps you should have written `turtle.Pen` instead of `Pen`.

```
>>> |
```

## *Mandering evolution*

I am just a hobbyist who has been developing a project based on suggestions from a few users and my own intuition of what was needed, without guidance from experts.

Am I making the right choices?



# Justification after the fact?

## **On Designing Programming Error Messages for Novices: Readability and its Constituent Factors**

Paul Denny, Brett A. Becker, Catherine Mooney, John Homer, Zachary C. Albrecht, Gary B. Powell

CHI Conference on Human Factors in Computing Systems, **May 2021**.

<https://www.youtube.com/watch?v=5-k9f3iFzXQ>

<https://dl.acm.org/doi/fullHtml/10.1145/3411764.3445696>

Justification after the fact: a single paper

## On Designing Programming Error Messages for Novices: Readability and its Constituent Factors

Paul Denny, Brett A. Becker, Catherine Mooney, John Homer, Zachary C. Albrecht, Gary B. Powell

CHI Conference on Human Factors in Computing Systems, May 2021.

*“In educational contexts, the detrimental effects of cryptic error messages on novice programmers have been reported throughout the literature for decades...”*

# On Designing Programming Error Messages for Novices: Readability and its Constituent Factors

Important factors for readability: length and jargon



# On Designing Programming Error Messages for Novices: Readability and its Constituent Factors

Important factors for readability: length and jargon

- Remove jargon and acronyms
- Write messages in complete sentences
- Use simple vocabulary
- Use an economy of words.

# On Designing Programming Error Messages for Novices: Readability and its Constituent Factors

Important factors for readability: length and jargon

- Remove jargon and acronyms
- Write messages in complete sentences
- Use simple vocabulary
- Use an economy of words.

**No mention of colour.**

# On Designing Programming Error Messages for Novices: Readability and its Constituent Factors

*“We focus on readability which, we argue, is more fundamental [than usability] ”*

# On Designing Programming Error Messages for Novices: Readability and its Constituent Factors

*“We focus on readability which, we argue, is more fundamental [than usability] ”*

**Usability:** How actionable a message is?

- Information about error locality
- Message precision

# On Designing Programming Error Messages for Novices: Readability and its Constituent Factors

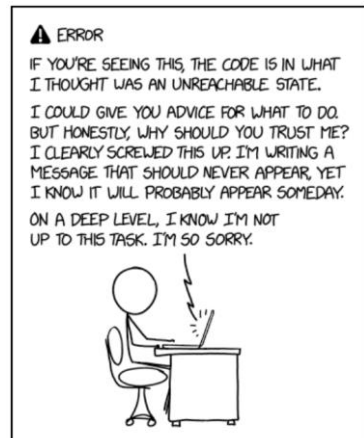
Student evaluations of error messages from  
Java, C, Python.



# On Designing Programming Error Messages for Novices: Readability and its Constituent Factors

Student evaluations of error messages from  
Java, C, Python.

Python was rated the worst.



## On Designing Programming Error Messages for Novices: Readability and its Constituent Factors

Observation: Python 3.10 and upcoming 3.11 (PEP 657) include many improvements for message **usability**...

# On Designing Programming Error Messages for Novices: Readability and its Constituent Factors

Python 3.6 and 3.7

AttributeError: module 'turtle' has no attribute 'forward'

Python 3.8+

AttributeError: partially initialized module 'turtle' has no attribute  
'forward' (most likely due to a circular import)

# On Designing Programming Error Messages for Novices: Readability and its Constituent Factors

Python + friendly

AttributeError: [...] module 'turtle' has no attribute 'forward' [...]

Did you give your program the same name as a Python module?

# Python

- Technical English
- Intermediate to Advanced

# Friendly

- Simple English
- Simple French
- etc.
- Beginner to Intermediate

# Incorporate friendly-traceback into Mu #963



Open

ntoll opened this issue on 1 Dec 2019 · 17 comments



ntoll commented on 1 Dec 2019

Milestone

1.2

# Add support for IPython #126



Closed

aroberge opened this issue on 30 Nov 2020 · 9 comments



Carreau commented on 30 Nov 2020

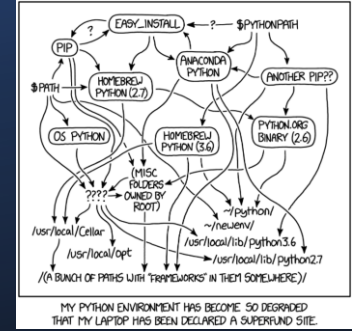


Great ! Thanks; if you ever get to it I would be ok to have friendly TB be automatically enabled in IPython if installed.



1

# To find out more

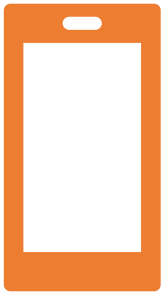


```
python -m pip install friendly
python -m friendly
```

```
>>> Friendly
[some useful information]
>>> www( )      # read the documentation
>>> www('bug')  # file an issue
```



# Conclusion



**Use it**



**Read the documentation**

Design choices

Give feedback

# Questions?

## CONFERENCE QUESTION

I HAVE A QUESTION.

WELL, LESS OF A QUESTION  
AND MORE OF A COMMENT.

I GUESS IT'S LESS OF A COMMENT  
AND MORE OF AN UTTERANCE

REALLY IT'S LESS AN UTTERANCE,  
MORE AN AIR PRESSURE WAVE.

IT'S LESS AN AIR PRESSURE WAVE  
AND MORE A FRIENDLY HAND WAVE.

I GUESS IT'S LESS A FRIENDLY  
WAVE THAN IT IS A FRIENDLY BUG.

I FOUND THIS BUG AND NOW WE'RE  
FRIENDS. DO YOU WANT TO MEET IT?

