

Demystifying Debugging

```
(base) Tizianas-MacBook-Pro:Desktop tizianaligorio$ python3 test.py
File "test.py", line 7
```

```
      ^
SyntaxError: unexpected EOF while parsing
(base) Tizianas-MacBook-Pro:Desktop tizianaligorio$
```



Syntax Error

i.e. the program doesn't run and you get an error message.

It only means you typed something wrong!

1. Don't panic!
2. Read the error message out loud (yes, you need to hear it!)
3. Does it mention a line number?
4. Could be misspelling
5. Could be missing operator (: . etc.
6. Could be wrong order — "hello" = s instead of s = "hello"
7. Follow the hint!!! 🔍



Demystifying Debugging

Logic Error

i.e. the program runs but it produces wrong output.

https://en.wikipedia.org/wiki/Rubber_duck_debugging

Analyze the process and pay attention to detail!

1. Don't panic!
2. Read the instructions carefully, maybe you misinterpreted the assignment.
3. **Talk to the ducky!**
 - Pull out a rubber ducky
 - Read one line at a time through the code
 - Explain to the ducky why every single thing you've written is *clearly and obviously* correct, being as specific and precise as possible.



Demystifying Debugging

Logic Error

i.e. the program runs but it produces wrong output.

Still talking to the ducky...

- Slicing, looping, decisions? Explain to the ducky why the **bounds** are totally correct and there isn't even an **off-by-one error**.
- Working with decisions? Explain to the ducky why your condition is totally correct with **every edge case**.
- Calling a function? Explain to the ducky what the function returns (its **output**) and why every **input** it receives from your program is absolutely correct.

Demystifying Debugging



Infinite Loop

i.e. the program runs but
... it won't stop

Keep talking to the ducky, it's just another logic error

- Explain to the ducky why the **bounds** are totally correct and your loop variable moves **towards the stop condition**.



Demystifying Debugging

It takes practice, it gets easier ...
and it feels good when you find that bug!



<https://runestone.academy/runestone/books/published/fopp/Debugging/intro-DebuggingGeneral.html>

<https://runestone.academy/runestone/books/published/thinkcspy/GeneralIntro/WhatisDebugging.html>

<https://runestone.academy/runestone/books/published/thinkcspy/Debugging/toctree.html>

<https://runestone.academy/runestone/books/published/thinkcspy/Appendices/errorsAndDebug.html>