

# Debug

## Debugging

### assert

- ??????????
- `assert <condition>, <message>` : ?? condition ? True????????? False????????????

```
x = 5
assert x == 5, "x should be 5"

assert type(username) == str, "username must be a string"
```

### printf debugging

```
print("Processing {}".format(basename))
```

### strace

- [Linux strace Command Tutorial for Beginners \(8 Examples\)](#)

```
# Installation on RHEL if it's not installed
yum install strace

# Tracing system calls made by a program
strace ./my-program.py
strace -o my-program.strace ./my-program
```

## Crash

### pdb

???

- ???????
- ???????
- ?????
- ?????????

```
pdb3 myprog.py
```

## pdb-subcommands

- continue : ??????????????
- print() : ???????

```
(Pdb) continue
```

```
...
```

```
(Pdb) print(row)
```

## Step 1: Set a breakpoint

```
import pdb

def add_numbers(a, b):
    pdb.set_trace() # This will set a breakpoint in the code
    result = a + b
    return result

print(add_numbers(3, 4))
```

## Setp 2: Enter the interactive debugger

- *a* (args): Show the arguments of the current function.
- *b*: Manually set a persistent breakpoint while in debugger.
- *n* (next): Execute the next line within the current function.
- *s* (step): Execute the current line and stop at the first possible occasion (e.g., in a function that is called).
- *c* (continue): Resume normal execution until the next breakpoint.
- *p* (print): Evaluate and print the expression, e.g., *p variable\_name* will print the value of *variable\_name*.
- *Pp* (pretty-print): Pretty-print the value of the expression.
- *q* (quit): Exit the debugger and terminate the program.
- *r* (return): Continue execution until the current function returns.
- *tbreak*: Manually set a temporary breakpoint that goes away once hit the first time.

- `!`: Prefix to execute an arbitrary Python command in the current environment, e.g., `!variable_name = "new_value"` will set `variable_name` to `"new_value"`.

### Step 3: Inspect variables

To inspect the variables, simply type the single character, `p`, then the variable name to see its current value. For instance, if you have a variable in your code named `sentiment_score`, just type `p sentiment_score` at the `pdb` prompt to inspect its value.

### Step 4: Modify variables

A big advantage of `pdb` is that you can change the value of a variable directly in the debugger. For example, to change `sentiment_score` to 0.9, you'd type `!sentiment_score = 0.9`.

To confirm these changes, use `a` or directly probe the value with `p <value name>`.

### Step 5: Exit the debugger

When you're done, simply enter `q` (quit) to exit the debugger and terminate the program.

### Post-mortem debugging

```
python -m pdb your_script.py
```

## Memory Leaks

??

### memory\_profiler

??

```
python3 -m memory_profiler myprog.py
```

### In Code

- `? main()` `???? @profile ??`
- `@ ????` Decorator: `? Python ??????????????????????????????`
- [memory-profiler](#)

```
from memory_profiler import profile
```

```
...
```

...

@profile

def main():

...

...

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Revision #9

Created 20 December 2024 14:27:55 by Admin

Updated 20 December 2024 16:35:38 by Admin