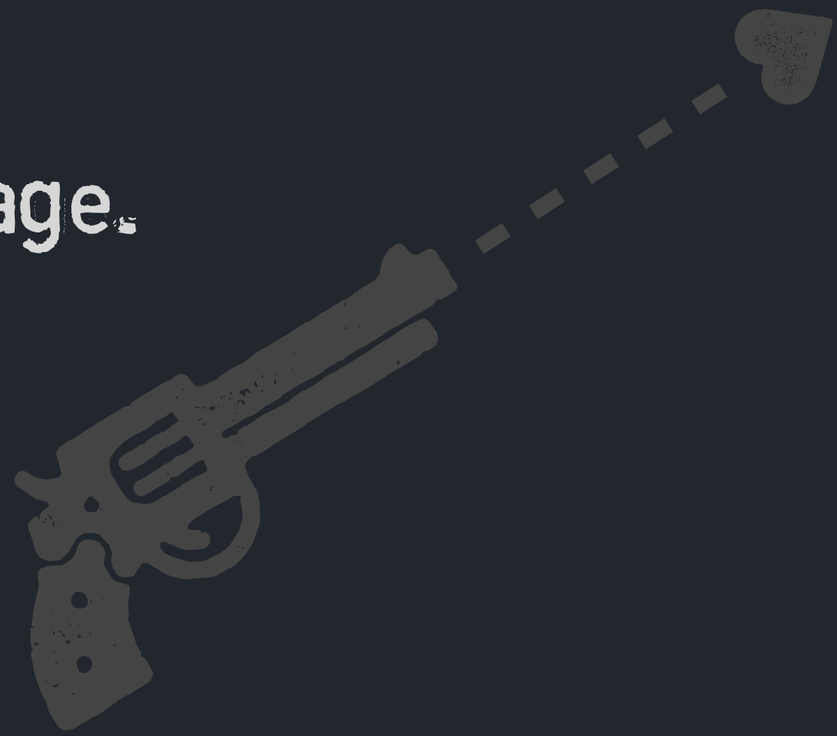
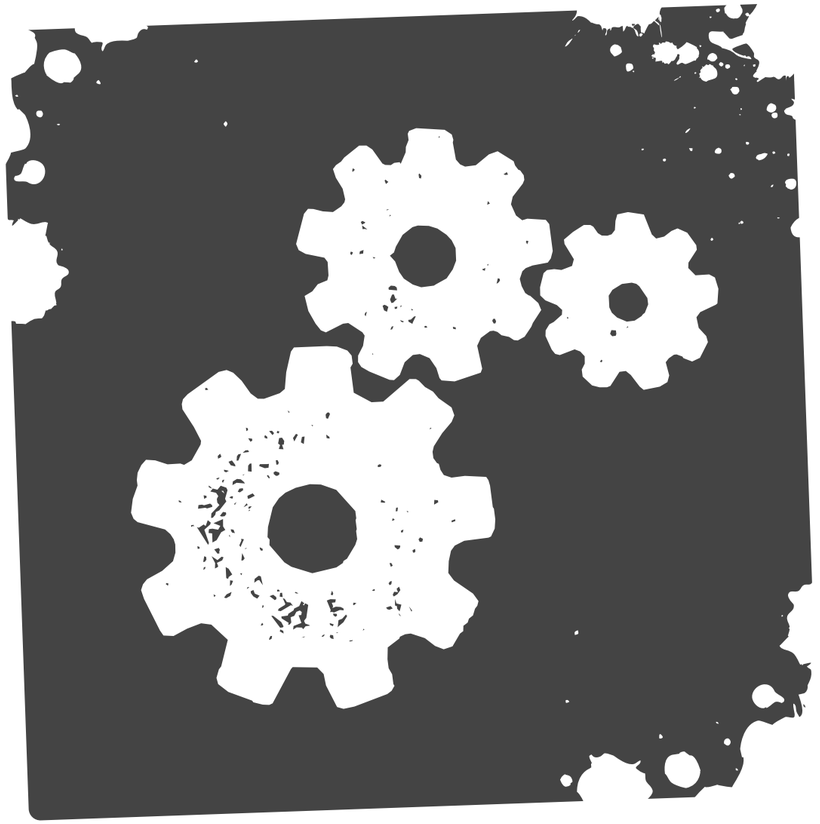
THINKING
OUTSIDE
THE BOX

Hello. I'm Armin!
I do Computers - with Python.
Currently at Fireteam / Splash Damage.

We do Internet for Pointy Shooty Games.



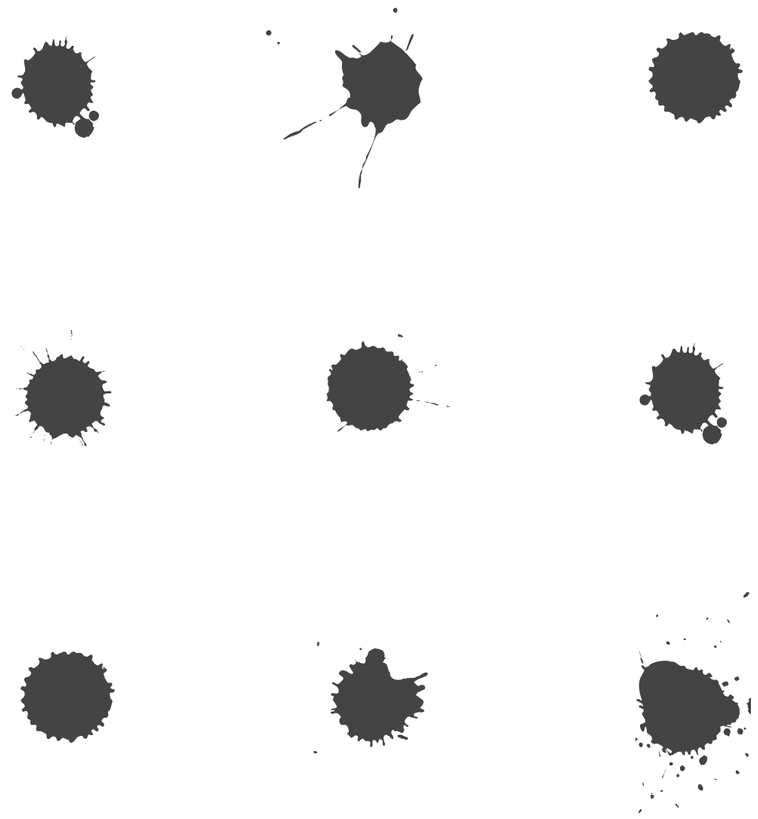


the box is comfortable

the comfort is dangerous

the 9 dots puzzle

(and things of similar nature)

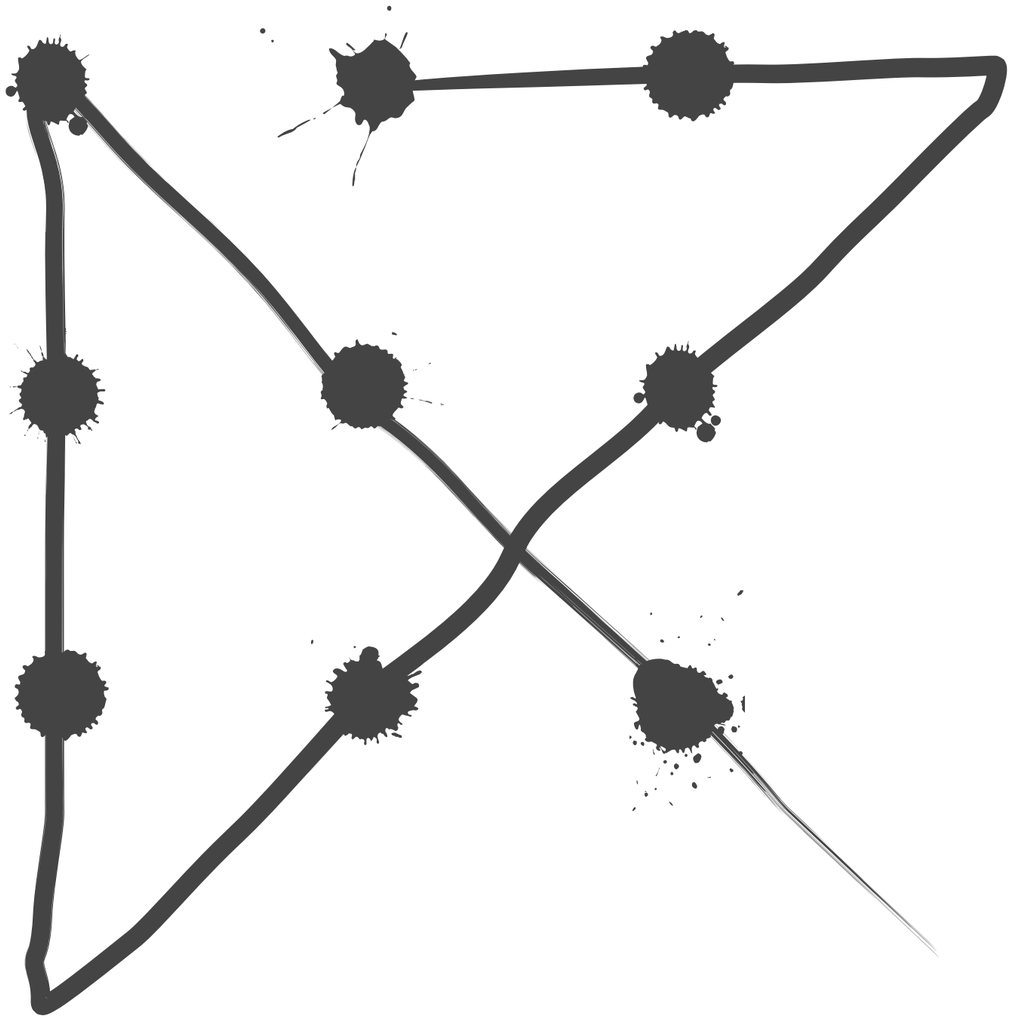


connect the dots

using exactly 4
straight lines,

without retracing

or removing one's
pen from the paper



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i know it's cliché

the six thinking hats

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“the majority is always wrong.”

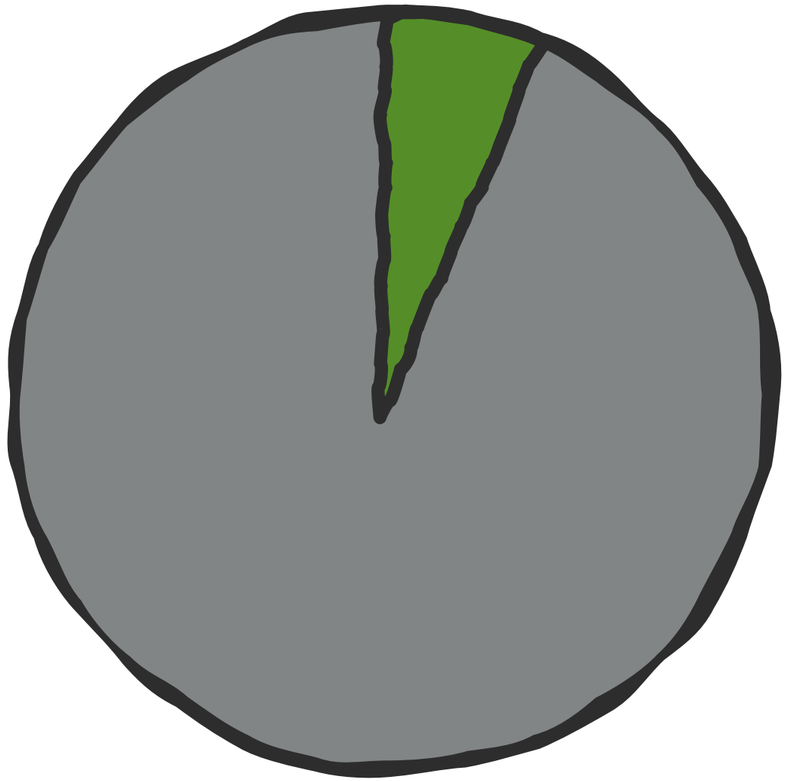
congratulations;
you're now a cynical asshole

1 a change of environment

computer games

Online infrastructure

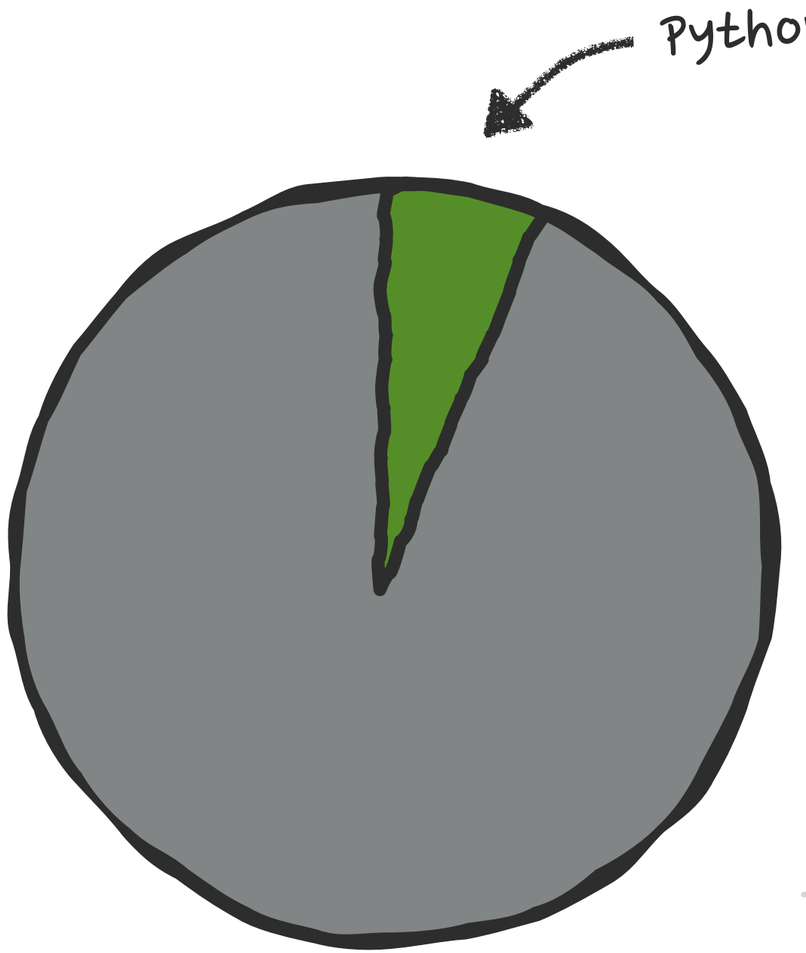
Game code



* this graph is not very scientific

Online infrastructure

Game code



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community influences your thinking ...

C++ good;
Scripting Languages Bad

... if it takes you 30 minutes to do a one line change then you obviously would not want to have runtime type checks ...

it's too easy to dismiss
something on fringe or
outdated experience alone

- never underestimate how much your environment/community influences you

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(unfortunately that also includes things like "the GIL is not a problem")

2 asking the right questions

the wrong questions
are easy to spot on others

<redacted> how do I do something after return render_template(...) if I don't want to register teardown_request for all requests.

* he was looking for celery / message queue

* first expectation was that the user wanted to change the HTTP response

- teardown_request would not have worked anyways

better:

> “I don't want my user to wait while I do some processing on his data”

the box was Flask

how to ask the right questions

* assume you already started out wrong
* describe the *actual* problem

“How do I use ~~Websockets~~ with Flask?”

better:

“How do I notify my user about changes with low latency.”

question
leaves room
for the answer

(a) Server-sent events via WSGI

(b) application <-> redis <-> persistent
connection server

bit.ly/pypush

Jump on IRC

help out other people

3 questioning the right things

the worst parts in my libraries are the ones
where I took the design from elsewhere

it's not because
I know better ...

- most things have some design behind
- as people copy it, the original design gets obscured and forgotten
- the original design might no longer apply

- starting something new?
- question everything!

not with the intention of proving existing design wrong;

with the intention of understanding it.

paradigm shifts

Many times we don't even realize that things were an example of thinking outside the box.

(a) "echo" -> Request/Response objects

(b) Interactive Interpreters

That's also what makes it hard to find examples now ...

every idea is a rehash

don't get too excited when you feel all "obviously ..."

sometimes all that's necessary is transposing a concept from one industry to the other.

5 interesting examples

* Mill Processor:
  * Basic Block: One entry, one exit.
  * Break instruction bundles in half
  * Two decoders, one moves left from EBB entry point, one moves to the right

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two independent units. two separate caches

High-level Queues for Request Handling

Stateful Frontend Servers

Stateless Workers

* Sending around signed data
  * Cookies
  * Access/Refresh Tokens
  * Activation Links
  * Offers

- The Rust Programming Language
- Memory ownership tracking

(and otherwise just steal from C++, C, Python, Ruby, Haskell and Scheme)

* Spotify's Native/Web Bridge
  * spawns HTTP server on localhost:XXXXX
  * provides OAuth bridge
  * JavaScript authenticates with local server, sends commands and retrieves updates.

That's it;
Now ask questions

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calibration slide