23.08.2023

Pydantic v2

Technical hour

Sunniva Indrehus

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```
$ whoami
```

NGI scientist's aim

Understand a simplified version of the real world

Figure credit: Ali Bati

Engineering example

Define a valid **data model**

Perform operation X

Iterpret results

Pydantic

💥 v2.0 released 30.06.2023 💥

What's the fuzz?

- v2 promise 5-50x speed up compared to Pydantic v1
- ⭐ GitHub stars 15.4k (22.08.23)
- 📦 pr week ≈ 22M (week 34 2023)

Pydantic

Why?

🐍 Python is dynamically typed, and PEP484 Type Hints is not enforced during run time

What?

> Pydantic is the most widely used data validation library for Python.

From the official docs

Pydantic v2

A new core

- Validations outside of Python
- Recursive function calls with Rust and small overhead

Figure credit: Prashanth Rao

Pydantic v2

Some new features

- Functionality for discriminated unions
- `pydantic.functional_validators` let you do validation without `base_model` (*e.g* a function)
- Possibility to use `TypeAdapter` instead of `BaseModel`
- You can define `field_serializer` you can do *custom serialization*

Examples and inspiration

- Migration guide
- v1 to v2 video example

Speed-up for *free* 🔓

Language changes

`root_validator` ➡️ `model_validator`

`validated_data = [Wine(**item).model_dump(exclude_none=True, by_alias=True) for item in data]`

➡️

`validated_data = [Wine(**item).dict(exclude_none=exclude_none) for item in data]`

Speed-up with *investements* 💰

Demo some benchmarking

Example run times

Fruit	**Colour**	**Amount**	**Cost**
Banana	Yellow	4	£1.00
Apple	Red	2	£0.60
Orange	Orange	10	£2.50
Coconut	Brown	1	£1.50

Credit

Pydantic v2 Plan (accessed 22.08.2023)

Terrence Dorsey and Samuel Colvin Pydantic v2 Pre Release (accessed 22.08.2023)

Prashanth Rao, The Data Quarry, Obtain a 5x speedup for free by upgrading to Pydantic v2 (accessed 22.08.2023)

Yaakov Bressler in Medium (accessed 22.08.2023)

Samuel Colvin at PyCon US 2023 (accessed 22.08.2023)

Configuring mypy with Pydantic (accessed 22.08.2023)