

Grab the slides: bit.ly/be-pythonic

How to be Pythonic? Design a Query Language in Python

Cheuk Ting Ho

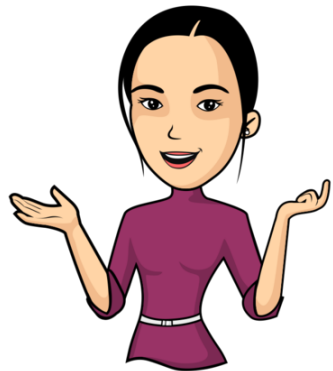
<https://cheuk.dev>



@cheukting_ho



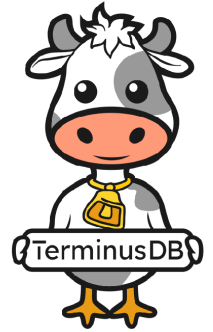
Cheukting

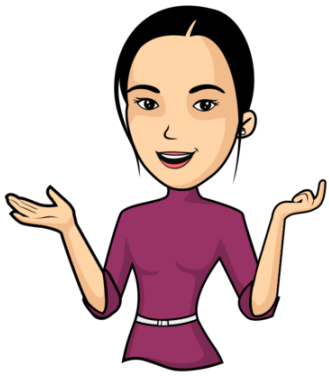


Chauk Ting Ho

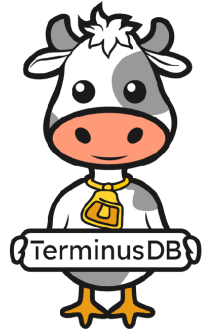
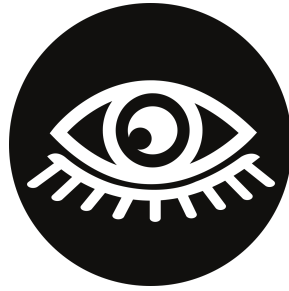


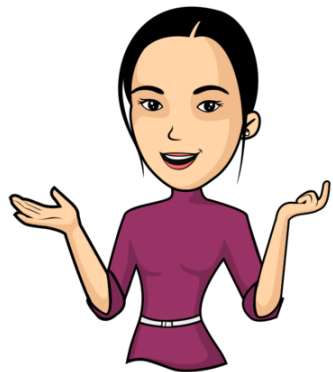
Cheuk Ting Ho



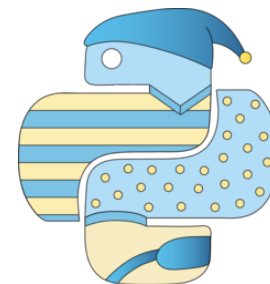


Chenck Ting Ho





Cheuk Ting Ho



https://www.twitch.tv/cheukting_ho

A close-up photograph of a snake's body, showing a complex pattern of scales in shades of blue, yellow, and brown. The scales are arranged in a repeating, overlapping pattern that creates a textured, almost pixelated appearance. The lighting highlights the individual scales, giving them a three-dimensional look.

**What does Pythonic
mean? (Is it a thing?)**

What does Pythonic mean? (Is it a thing?)

Is Pythonic a thing?

Yes

88.6%

No

11.4%

“ Pythonic means code that doesn't just get the syntax right but that follows the conventions of the Python community and uses the language in the way it is intended to be used.

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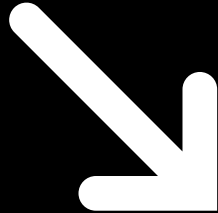
- Stackoverflow



Why can't I just do it
in a for-loop?

```
1  for i in (i; i < items.length ; i++)  
2  {  
3    n = items[i];  
4    ... now do something  
5  }
```

```
1 for i in (i; i < items.length ; i++)  
2 {  
3   n = items[i];  
4   ... now do something  
5 }
```



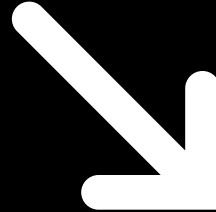
```
1 for i in items:  
2   i.perform_action()
```



```
1 for i in (i; i < items.length ; i++)  
2 {  
3   n = items[i];  
4   ... now do something  
5 }
```

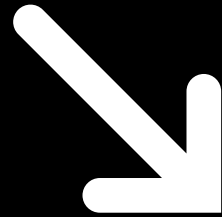


```
1 for i in items:  
2   i.perform_action()
```

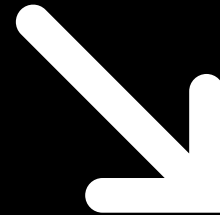


```
1 (i.some_attribute for i in items)
```

```
1 for i in (i; i < items.length ; i++)  
2 {  
3   n = items[i];  
4   ... now do something  
5 }
```



```
1 for i in items:  
2   i.perform_action()
```



```
1 (i.some_attribute for i in items)
```

Pythonic!



Design a Query Language in Python

Design a Query Language in Python

Who like SQL?

I love it

68.4%

No way

31.6%

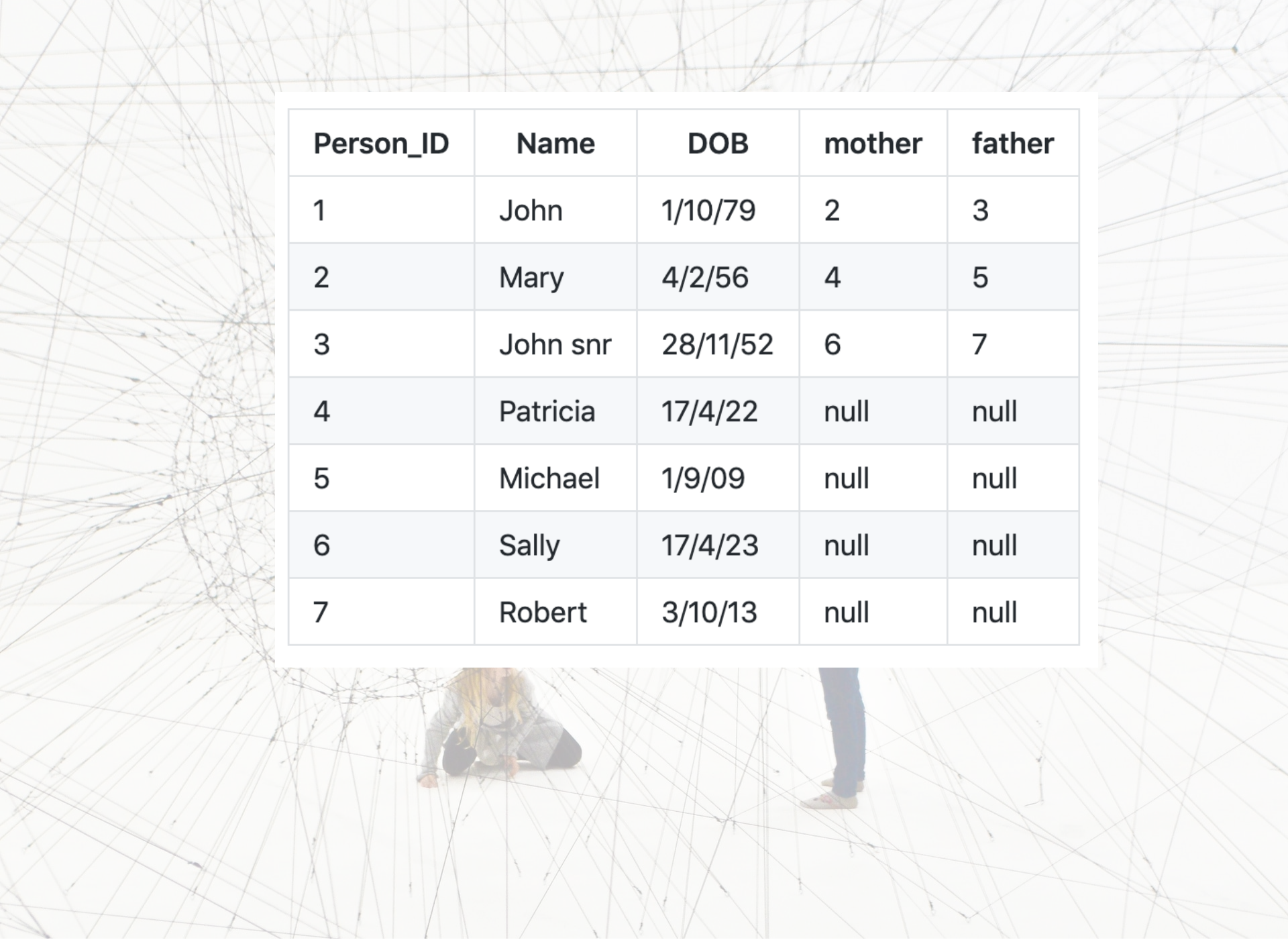
It all stated...

Developer Advocate of

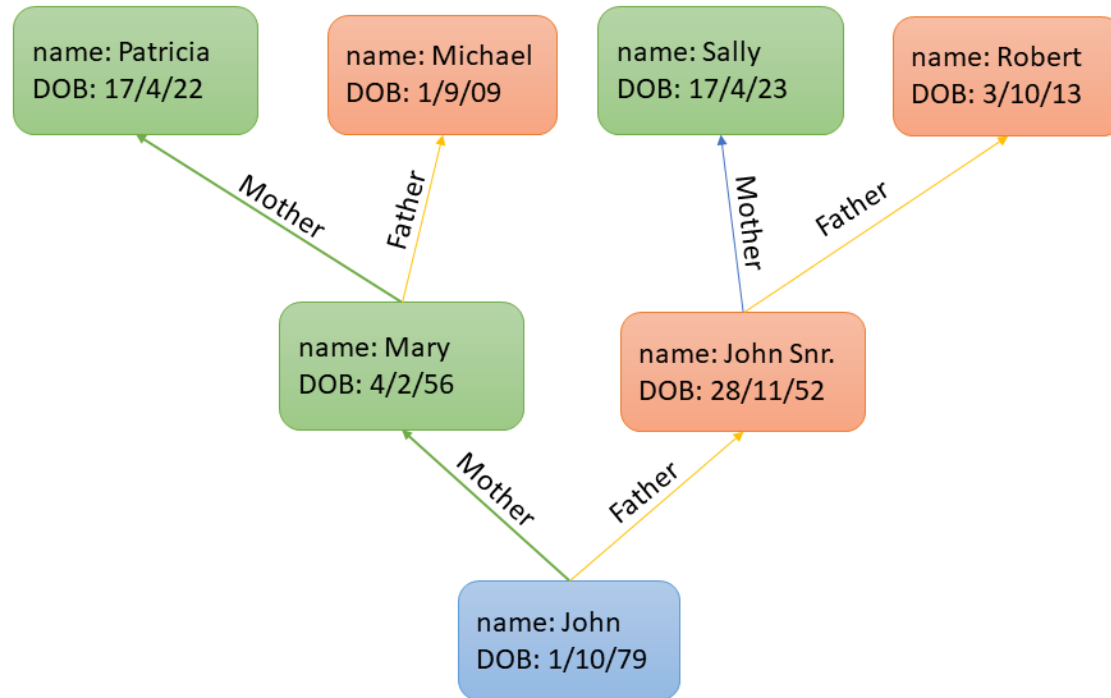


TerminusDB





Person_ID	Name	DOB	mother	father
1	John	1/10/79	2	3
2	Mary	4/2/56	4	5
3	John snr	28/11/52	6	7
4	Patricia	17/4/22	null	null
5	Michael	1/9/09	null	null
6	Sally	17/4/23	null	null
7	Robert	3/10/13	null	null



```
1 SELECT Name from TABLE where Person_ID =  
  (SELECT mother from TABLE where Name="John")  
2 SELECT Name from TABLE where Person_ID =  
  (SELECT mother from TABLE WHERE Person_ID =  
    (SELECT mother from TABLE where Name="John"))
```




```
1 WOQL.and(  
2     WOQL.triple("v:Person", "mother",  
3     "v:MotherID"),  
4     WOQL.triple("v:MotherID", "name",  
5     "v:MotherName"),  
6     WOQL.triple("v:MotherID", "mother",  
7     "v:GrandmotherID"),  
8     WOQL.triple("v:GrandmotherID", "name",  
9     "v:GrandmotherName"),  
10 )
```







WOQLpy

a Query Language Client for Pythonistas
and Data Scientists



WOQLpy

a Query Language Client for Pythonistas
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A top-down view of a round apple pie in a dark, possibly metal, pie dish. The pie features a golden-brown lattice crust made of wide strips of dough. Through the lattice, numerous slices of pale yellow apple are visible. The edges of the pie are slightly irregular and fluted. The background is a plain, light-colored surface.

What is WOQLpy?

It comes with the Python Client, which
you can pip install:

```
1 pip install terminusdb-client
```


It comes with the Python Client, which
you can pip install:

```
1 pip install terminusdb-client
```

****Newly added**** Output to DataFrames

```
1 pip install terminusdb-client[dataframe]
```

Change the result returned from your query into
pandas DataFrame



```
1 woql.query_to_df(result)
```

It let's you to "talk" to TerminusDB like this:

```
1 import terminusdb_client as woql
2 from terminusdb_client import WOQLQuery
3
4 db_id = "pybike"
5 client = woql.WOQLClient(server_url = "http://localhost:6363")
6 client.connect(key="root", account="admin", user="admin")
7 client.create_database(db_id, accountid="admin", label = "Bike Graph",
8                       description = "Create a graph with bike data")
9
10 station_dt = WOQLQuery().doctype("Station",
11                                   label="Bike Station",
12                                   description="A station where bikes are deposited")
13 bicycle_dt = WOQLQuery().doctype("Bicycle", label="Bicycle")
14 journey_dt = (
15     WOQLQuery().doctype("Journey", label="Journey").
16     property("start_station", "Station", label="Start Station").
17     property("end_station", "Station", label="End Station").
18     property("duration", "integer", label="Journey Duration").
19     property("start_time", "dateTime", label="Time Started").
20     property("end_time", "dateTime", label="Time Ended").
21     property("journey_bicycle", "Bicycle", label="Bicycle Used")
22 )
23 schema = station_dt + bicycle_dt + journey_dt
24 schema.execute(client)
```

Instead of this:

```
1 {
2   "when": [
3     {
4       "true": []
5     },
6     {
7       "and": [
8         {
9           "add_quad": [
10            "scm:Station",
11            "rdf:type",
12            "owl:Class",
13            "db:schema"
14          ]
15        },
16        {
17          "add_quad": [
18            "scm:Station",
19            "rdfs:subClassOf",
20            "tcs:Document",
21            "db:schema"
22          ]
23        },
24      ]
25    }
26  ]
27 }
```

You can do both

```
1 (WOQLQuery().doctype("Station")
2     .label("Bike Station")
3     .description("A station where bikes are deposited")
4 )
```

or

```
1 WOQLQuery().doctype("Station",
2     label="Bike Station",
3     escription="A station where bikes are deposited")
```


Which one do you prefer?

Chaining:

`WOQLQuery().doctype("journey").label("Journey")`

or

Multi-parameters:

`WOQLQuery().doctype("journey, label="Journey")`

Which one do you prefer?

Chaining:

`WOQLQuery().doctype("journey").label("Journey")`

or

Multi-parameters:

`WOQLQuery().doctype("journey, label="Journey")`

Which one do you prefer?

Multi-parameters

76%

Chaining

24%

Design challenges

JavaScript: WOQL.and()

Python: WOQLQuery().and() ?



Design challenges

JavaScript: WOQL.and()

Python: WOQLQuery().and()

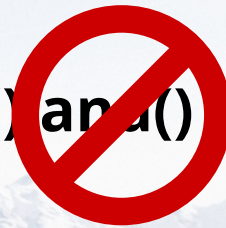


"and" is a key word, you dummy!

Design challenges

JavaScript: WOQL.and()

Python: WOQLQuery().and()



"and" is a key word, you dummy!

OK, woql_and then....😓

WOQLQuery().woql_and()

*** actually you can use the + operator
thanks for the overload ability in Python**

also happened to: or, not, as, from...



Look into the future



		End	End_Label	Start	Start_Label
0	http://localhost:6363/pybike/document/Station3...	S Glebe & Potomac Ave	http://localhost:6363/pybike/document/Station3...	Crystal City Metro / 18th & Bell St	
1	http://localhost:6363/pybike/document/Station3...	S Glebe & Potomac Ave	http://localhost:6363/pybike/document/Station3...	Crystal City Metro / 18th & Bell St	
2	http://localhost:6363/pybike/document/Station3...	New Hampshire Ave & T St NW	http://localhost:6363/pybike/document/Station3...	14th & V St NW	
3	http://localhost:6363/pybike/document/Station3...	New Hampshire Ave & T St NW	http://localhost:6363/pybike/document/Station3...	14th & V St NW	
4	http://localhost:6363/pybike/document/Station3...	Georgia Ave and Fairmont St NW	http://localhost:6363/pybike/document/Station3...	14th & V St NW	
...
1857	http://localhost:6363/pybike/document/Station3...	11th & O St NW	http://localhost:6363/pybike/document/Station3...	New Jersey Ave & N St NW/Dunbar HS	
1858	http://localhost:6363/pybike/document/Station3...	11th & O St NW	http://localhost:6363/pybike/document/Station3...	New Jersey Ave & N St NW/Dunbar HS	
1859	http://localhost:6363/pybike/document/Station3...	D St & Maryland Ave NE	http://localhost:6363/pybike/document/Station3...	2nd St & Massachusetts Ave NE	
1860	http://localhost:6363/pybike/document/Station3...	Maine Ave & 7th St SW	http://localhost:6363/pybike/document/Station3...	Potomac Ave & Half St SW	
1861	http://localhost:6363/pybike/document/Station3...	King Farm Blvd & Piccard Dr	http://localhost:6363/pybike/document/Station3...	Shady Grove Metro West	

1862 rows x 4 columns



	End	End_Label	Start	Start_Label
0	http://localhost:6363/pybike/document/Station3...	S Glebe & Potomac Ave	http://localhost:6363/pybike/document/Station3...	Crystal City Metro / 18th & Bell St
1	http://localhost:6363/pybike/document/Station3...	S Glebe & Potomac Ave	http://localhost:6363/pybike/document/Station3...	Crystal City Metro / 18th & Bell St
2	http://localhost:6363/pybike/document/Station3...	New Hampshire Ave & T St NW	http://localhost:6363/pybike/document/Station3...	14th & V St NW
3	http://localhost:6363/pybike/document/Station3...	New Hampshire Ave & T St NW	http://localhost:6363/pybike/document/Station3...	14th & V St NW
4	http://localhost:6363/pybike/document/Station3...	Georgia Ave and Fairmont St NW	http://localhost:6363/pybike/document/Station3...	14th & V St NW
...
1857	http://localhost:6363/pybike/document/Station3...	11th & O St NW	http://localhost:6363/pybike/document/Station3...	New Jersey Ave & N St NW/Dunbar HS
1858	http://localhost:6363/pybike/document/Station3...	11th & O St NW	http://localhost:6363/pybike/document/Station3...	New Jersey Ave & N St NW/Dunbar HS
1859	http://localhost:6363/pybike/document/Station3...	D St & Maryland Ave NE	http://localhost:6363/pybike/document/Station3...	2nd St & Massachusetts Ave NE
1860	http://localhost:6363/pybike/document/Station3...	Maine Ave & 7th St SW	http://localhost:6363/pybike/document/Station3...	Potomac Ave & Half St SW
1861	http://localhost:6363/pybike/document/Station3...	King Farm Blvd & Piccard Dr	http://localhost:6363/pybike/document/Station3...	Shady Grove Metro West

1862 rows x 4 columns

Can we have a nice graph visulization?



Load data from DataFrame



Load data from DataFrame



CLI client (with click?)

Load data from DataFrame



CLI client (with click?)

Many more fail-proof checks
e.g. check user inputs,
check database version etc...



World of WoqlCraft:
Every Friday 5pm UK time / 6pm CET

To get the newest update👍:
Follow us on Twitter: @TerminusDB
Website: <https://terminusdb.com/>

Join the community at Discord:
<https://discord.gg/Gvdqw97>

We want to hear from you 😊