How APL made me a better Python developer

by Rodrigo Girão Serrão

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Textualize

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“A language that doesn't affect the way you think about programming, is not worth knowing.”

— Alan J. Perlis

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What's APL?

APL = A Programming Language

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APL = A Programming Language

Terrible name, right?

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APL = A Programming Language

Terrible name, right?

Not really, it isn't a pun.

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Game of life

.apl

```
{↑1 ωv.∧3 4=+/,¯1 0 1∘.⊖¯1 0 1∘.⌽⊂ω}
```

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How APL made me a better Python developer

What learning APL taught me about Python

What learning APL taught me about Python

*mileage may vary

Stating the obvious can be good.

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Stating the obvious can be good.

Example: pigeonhole principle.

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The LOC that changed everything

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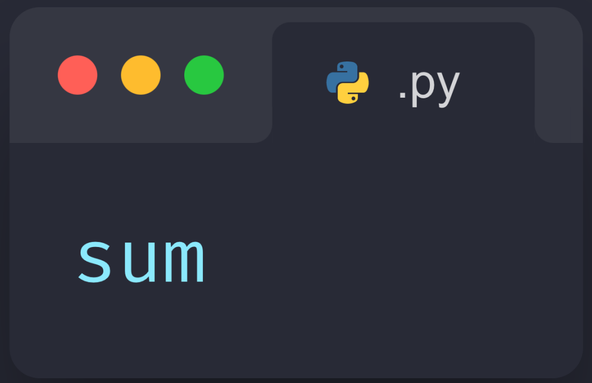
********** are

everywhere



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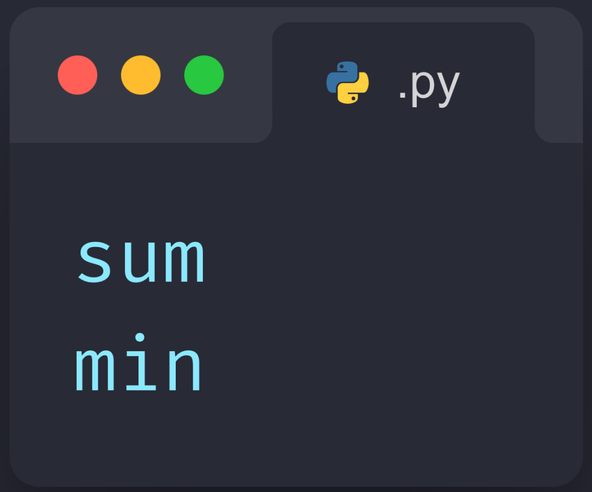

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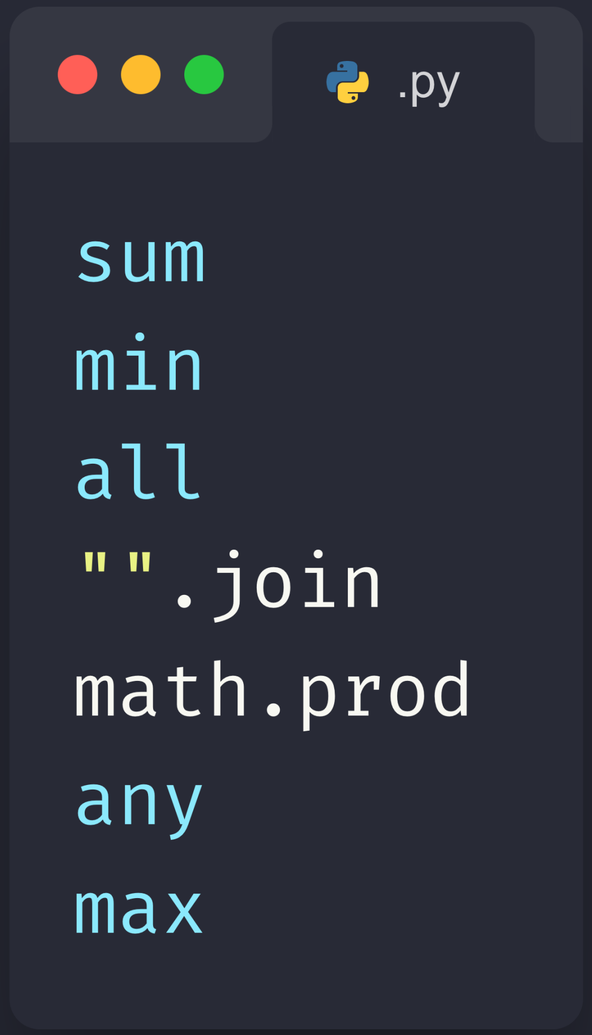

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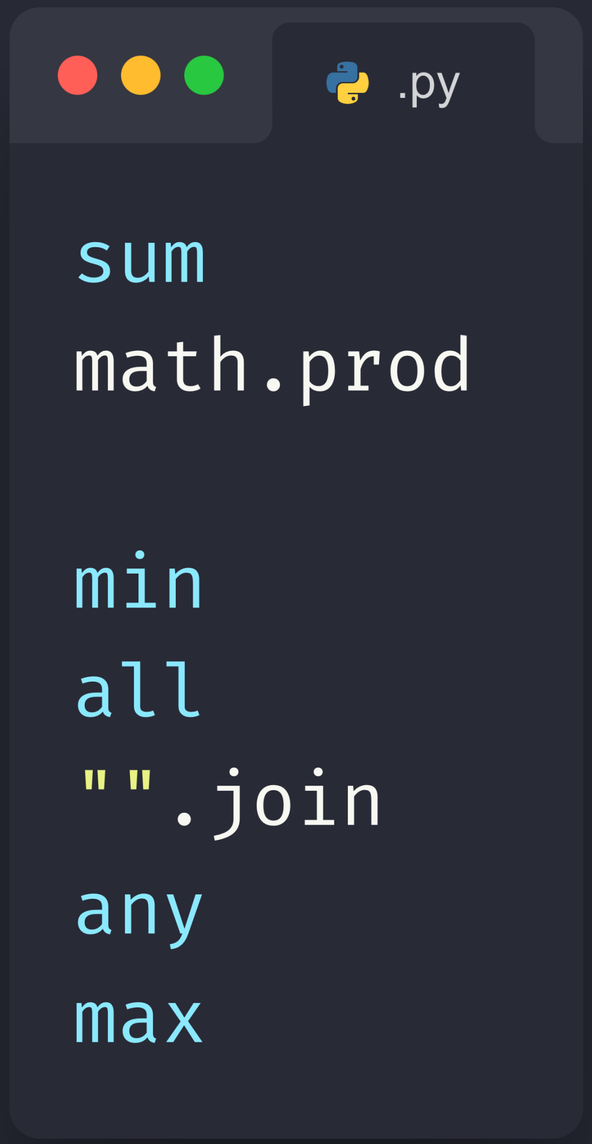

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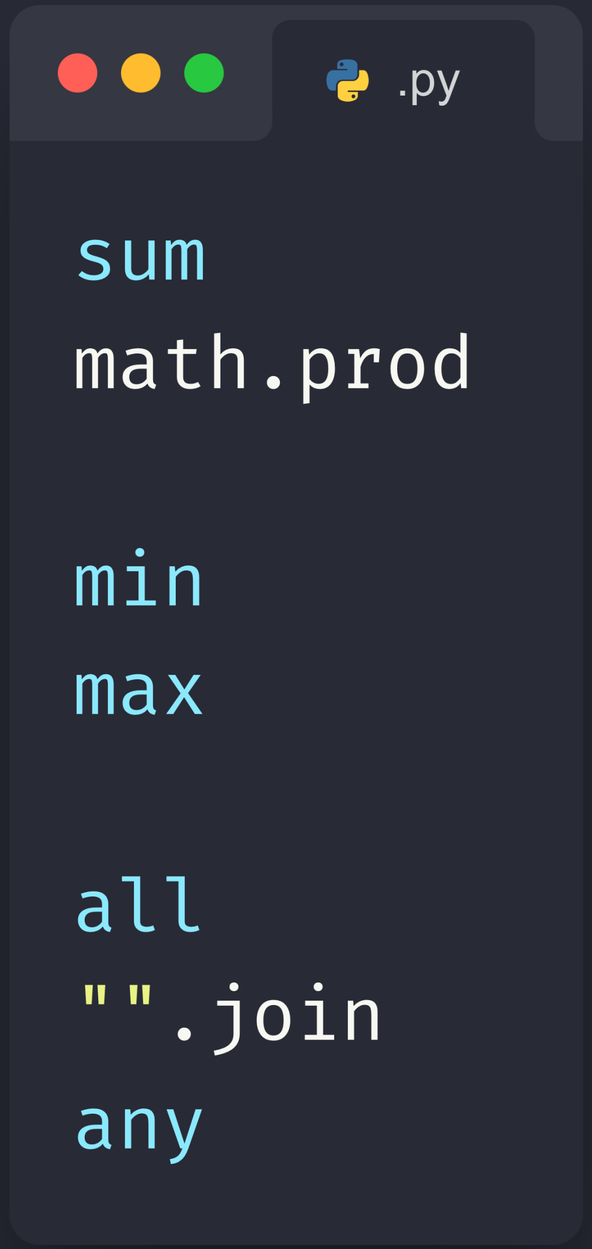

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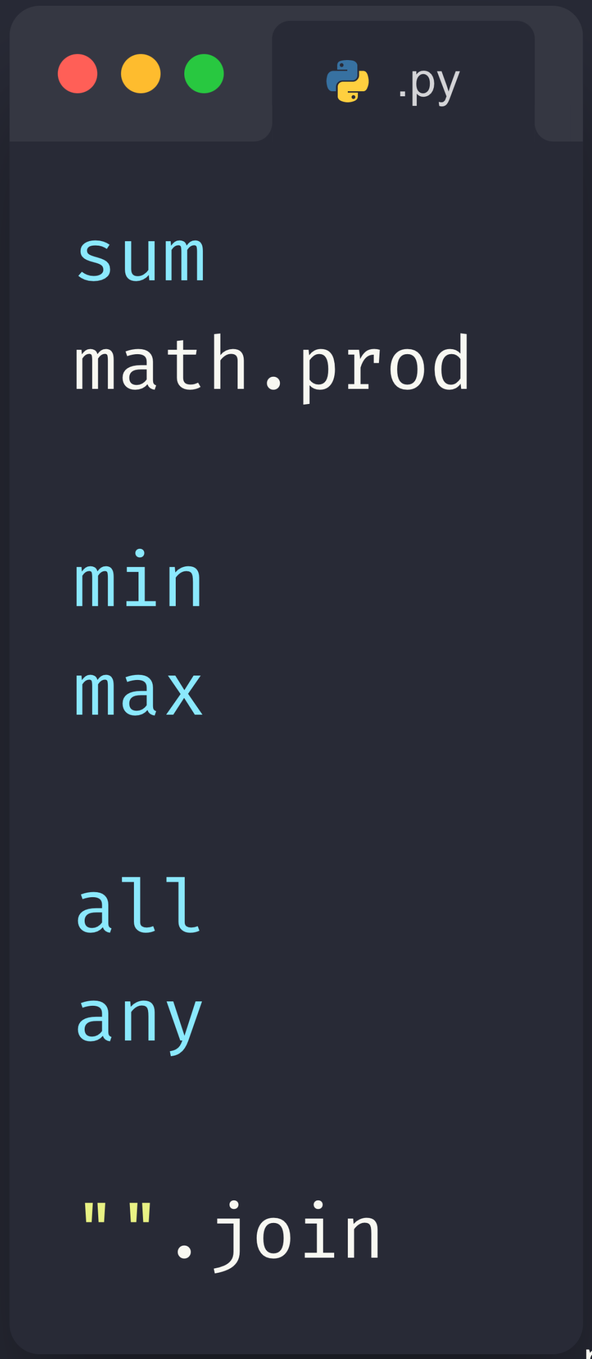

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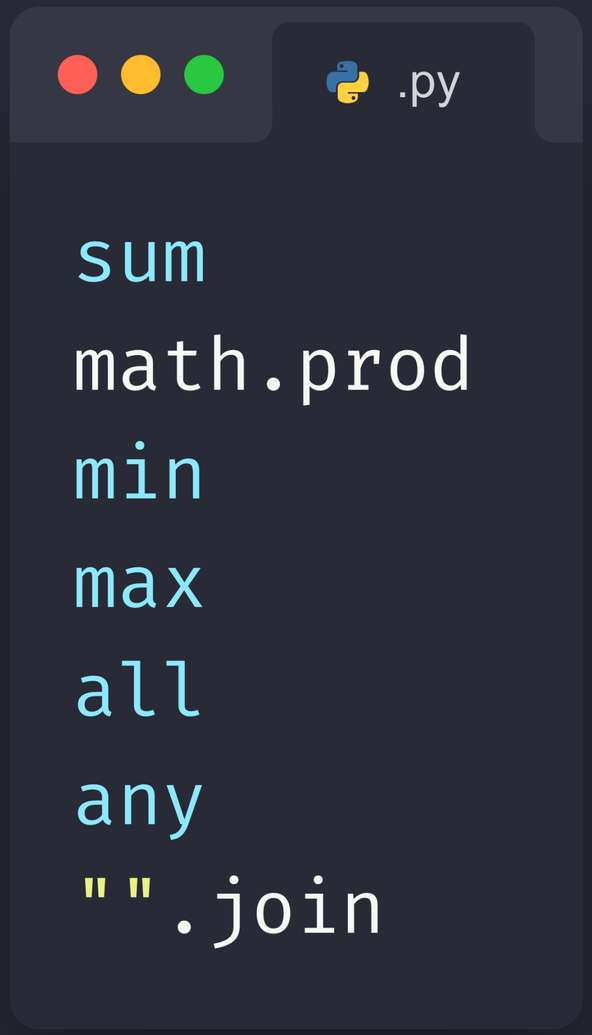

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.py

```
sum
math.prod
min
max
all
any
"".join
```

.apl

```
+/
```

rodrigo@mathspp.com

.py

```
sum
math.prod
min
max
all
any
"".join
```

.apl

```
+/
×/
```

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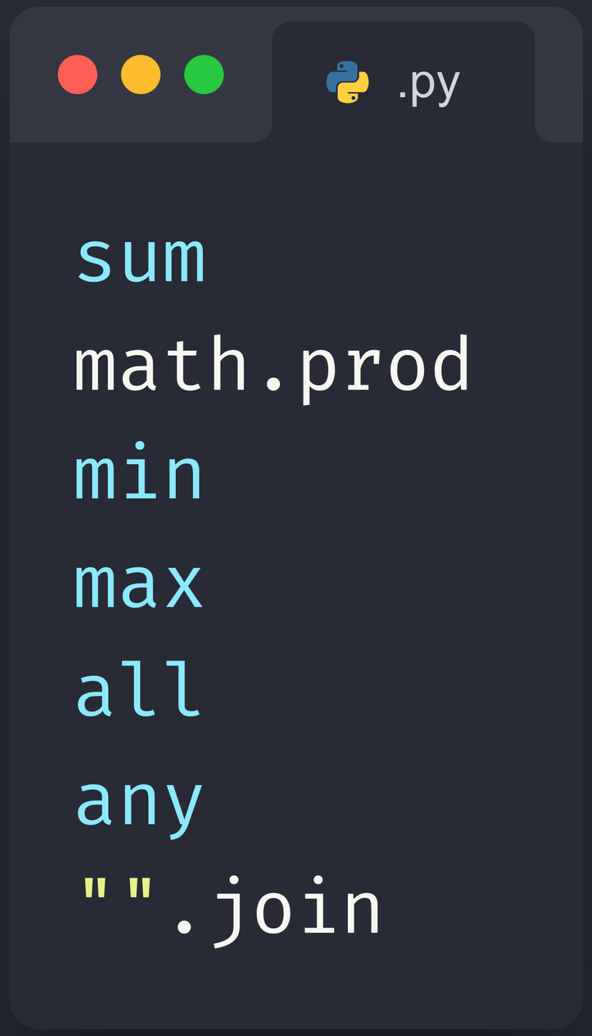

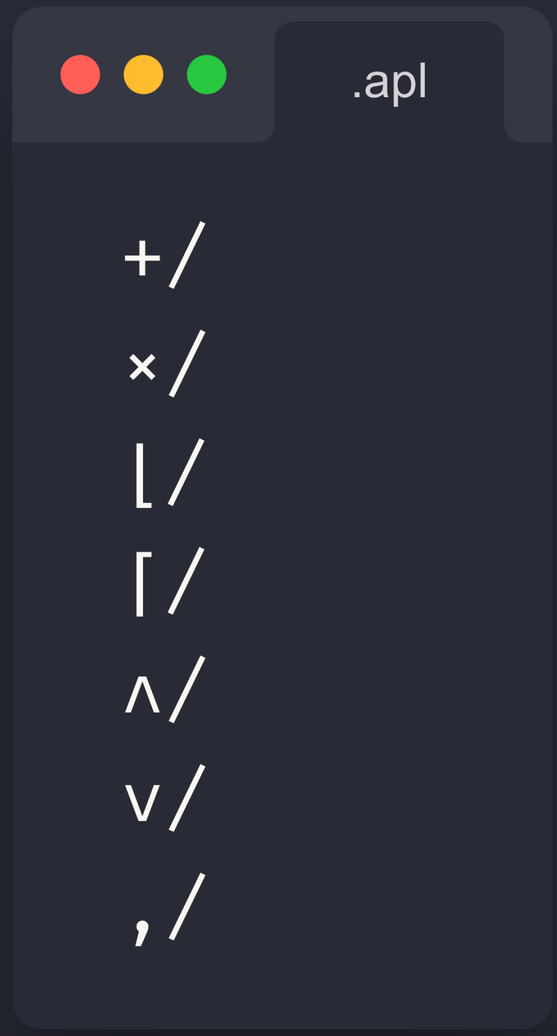

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.py

```
sum
math.prod
min
max
all
any
"".join
```

.apl

```
+/
×/
⌊/
⌈/
∧/
∨/
,/
```

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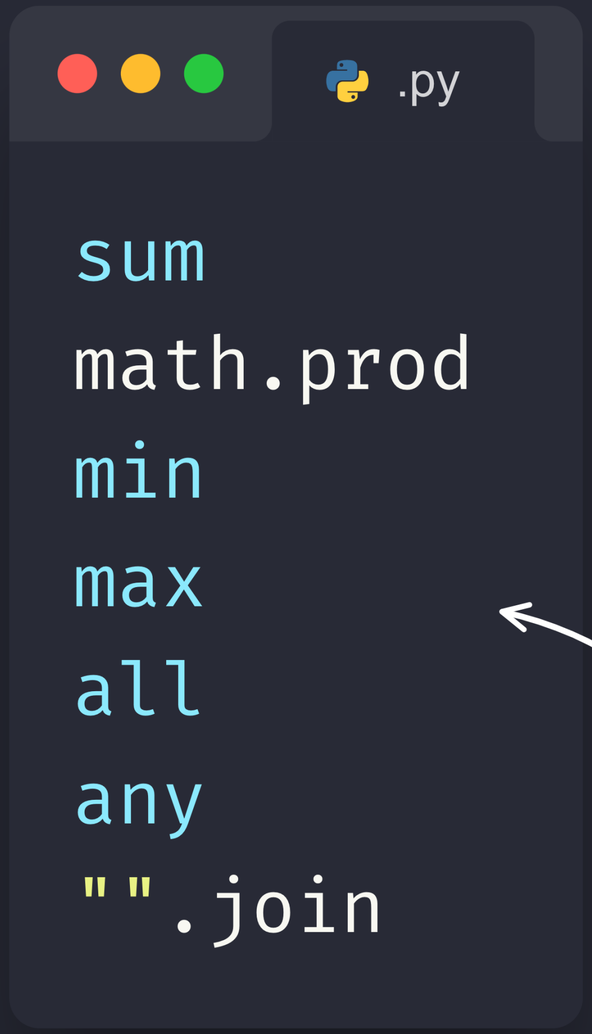

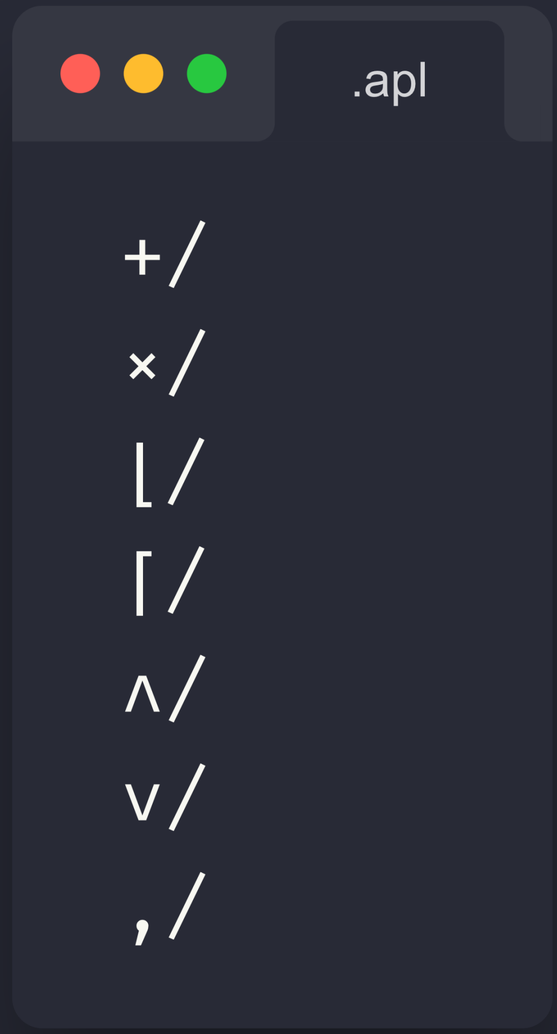

These are all the same thing!

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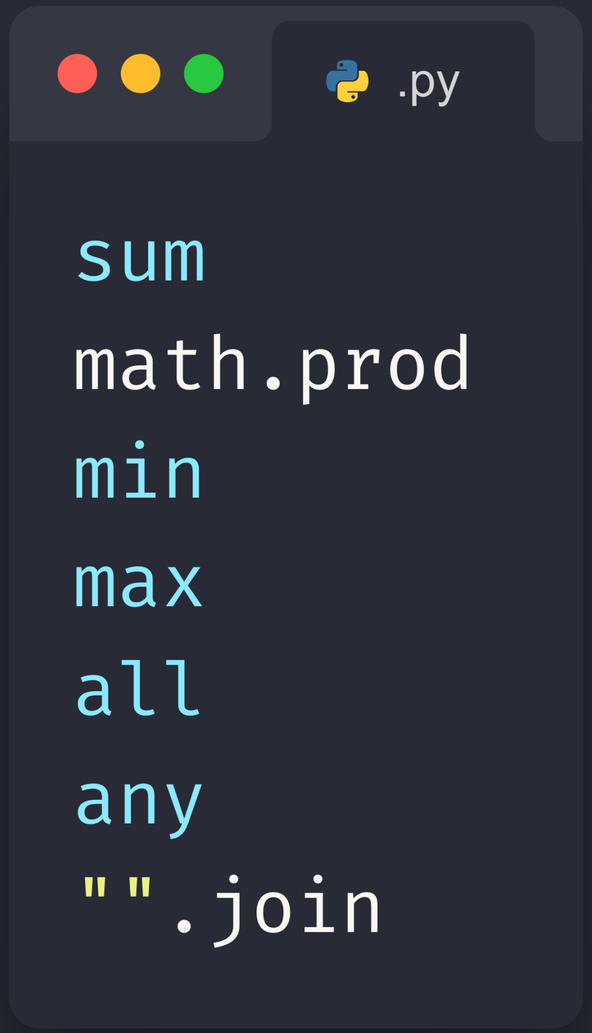

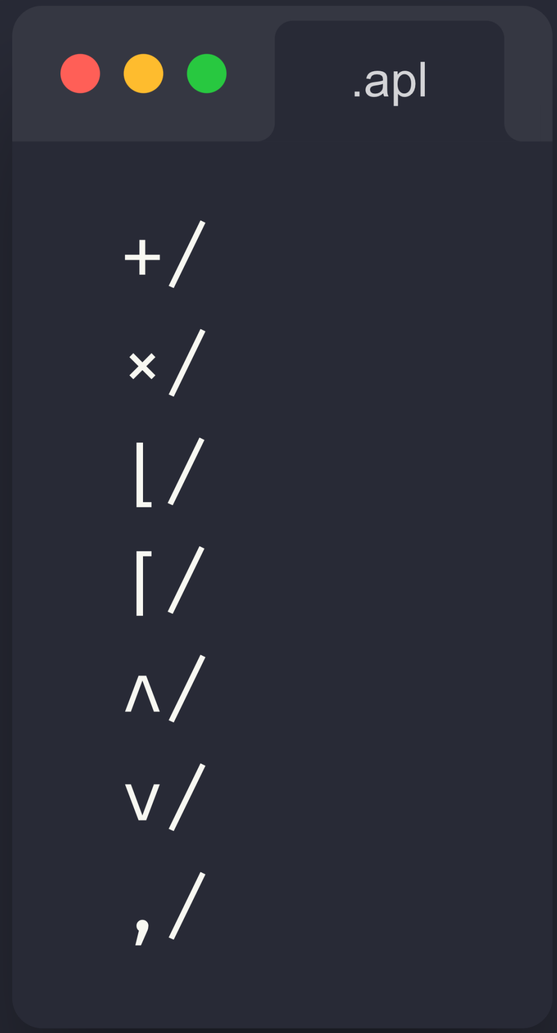

functools.reduce

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********** are

everywhere

Reductions are everywhere

Data-driven conditionals

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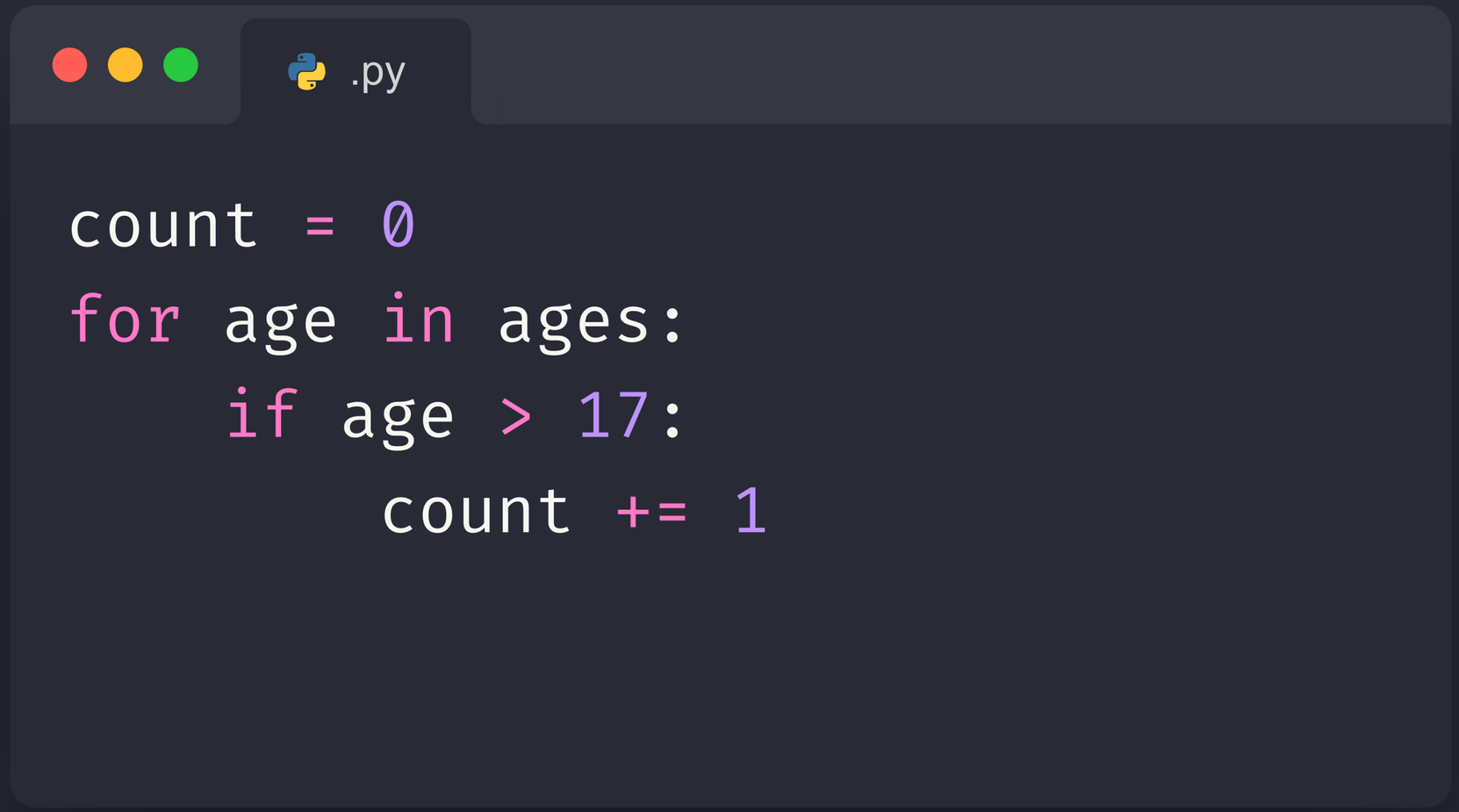

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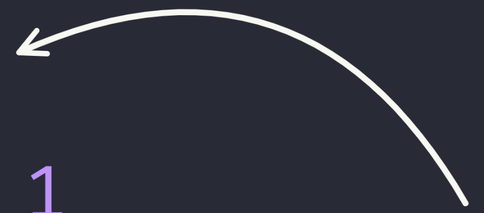
.py

```
count = 0
for age in ages:
    if age > 17:
        count += 1
```



Do we add? 🤔

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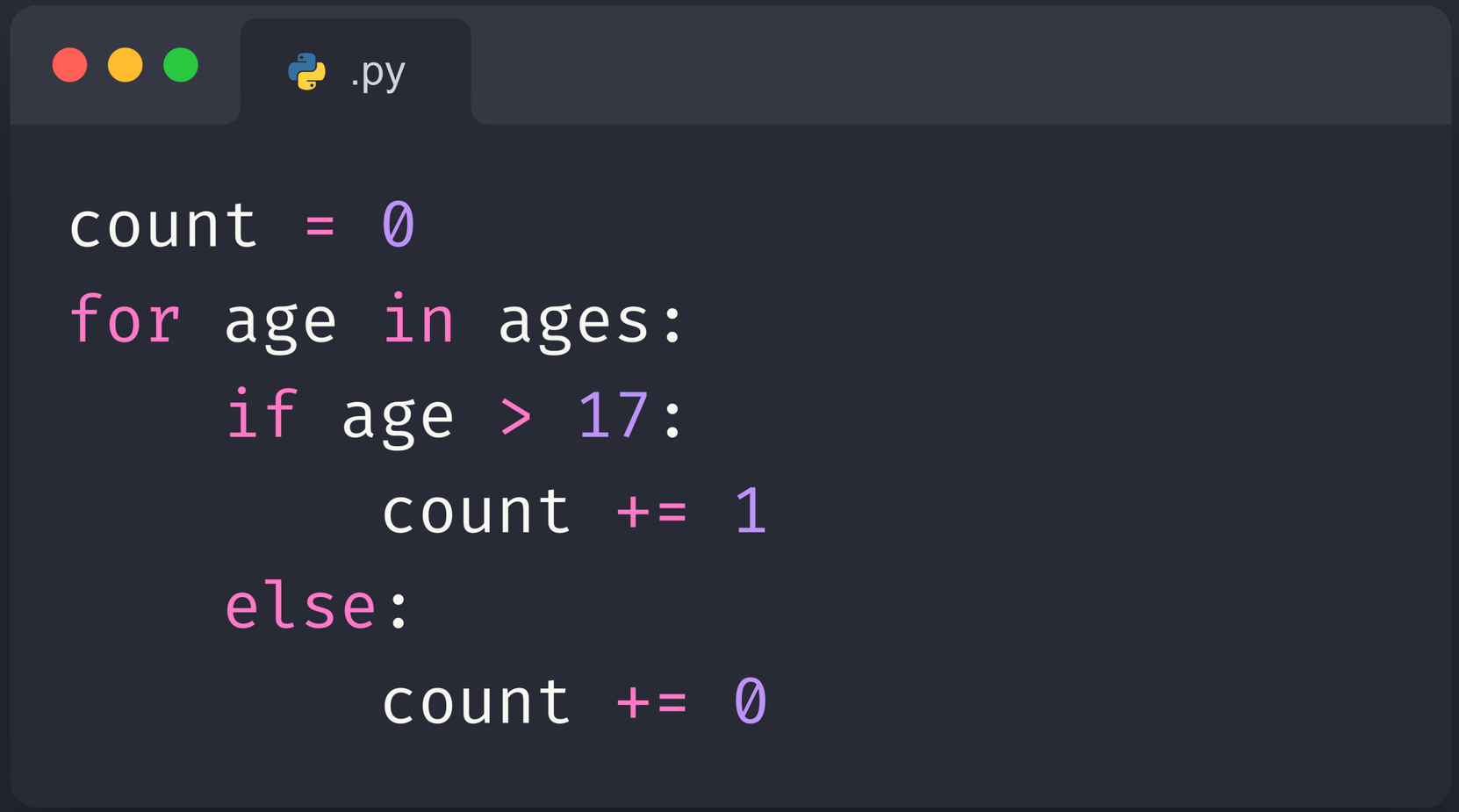

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.py

```python
count = 0
for age in ages:
    if age > 17:
        count += 1
    else:
        count += 0
```

“Useless” but correct

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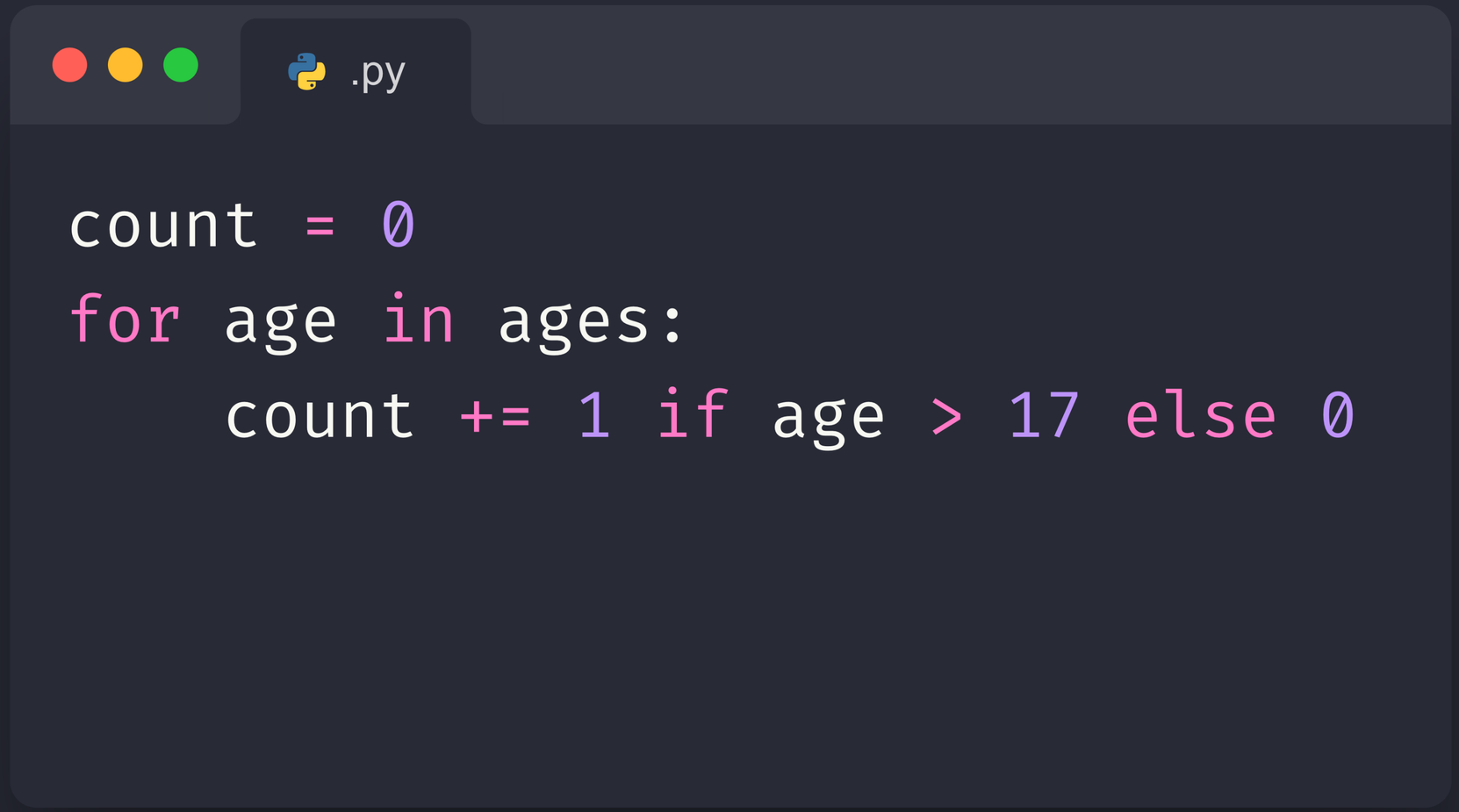

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.py

```
count = 0
for age in ages:
    count += 1 if age > 17 else 0
```

What do we add? 🤔

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.py

```
count = 0
for age in ages:
    count += 1 if age > 17 else 0
```

What do we add? 🤔

Data-driven conditionals

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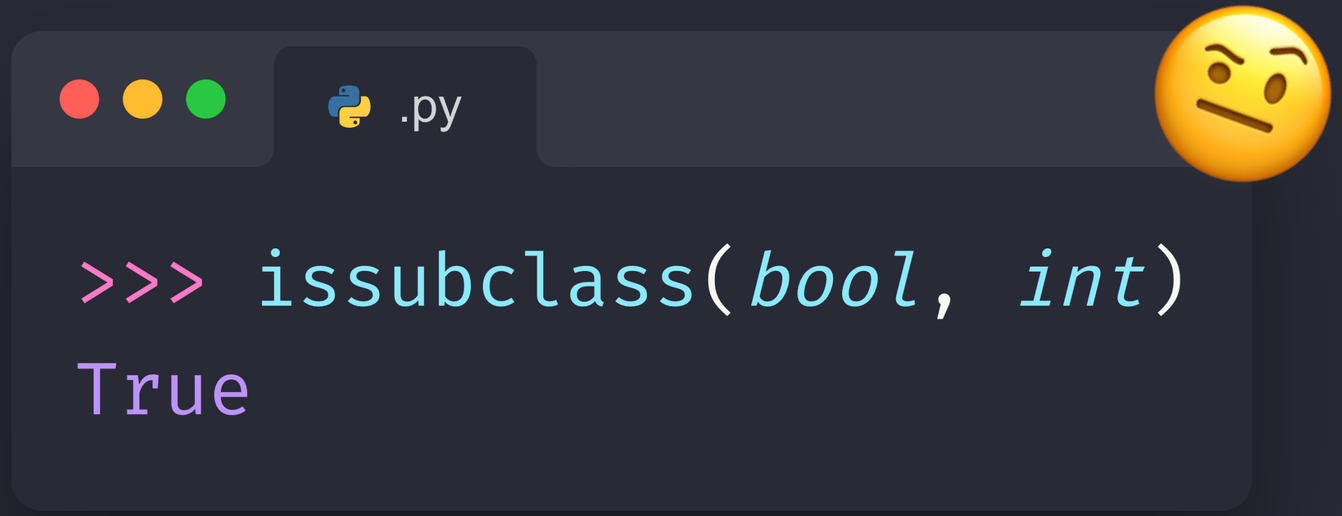
Booleans and 0/1



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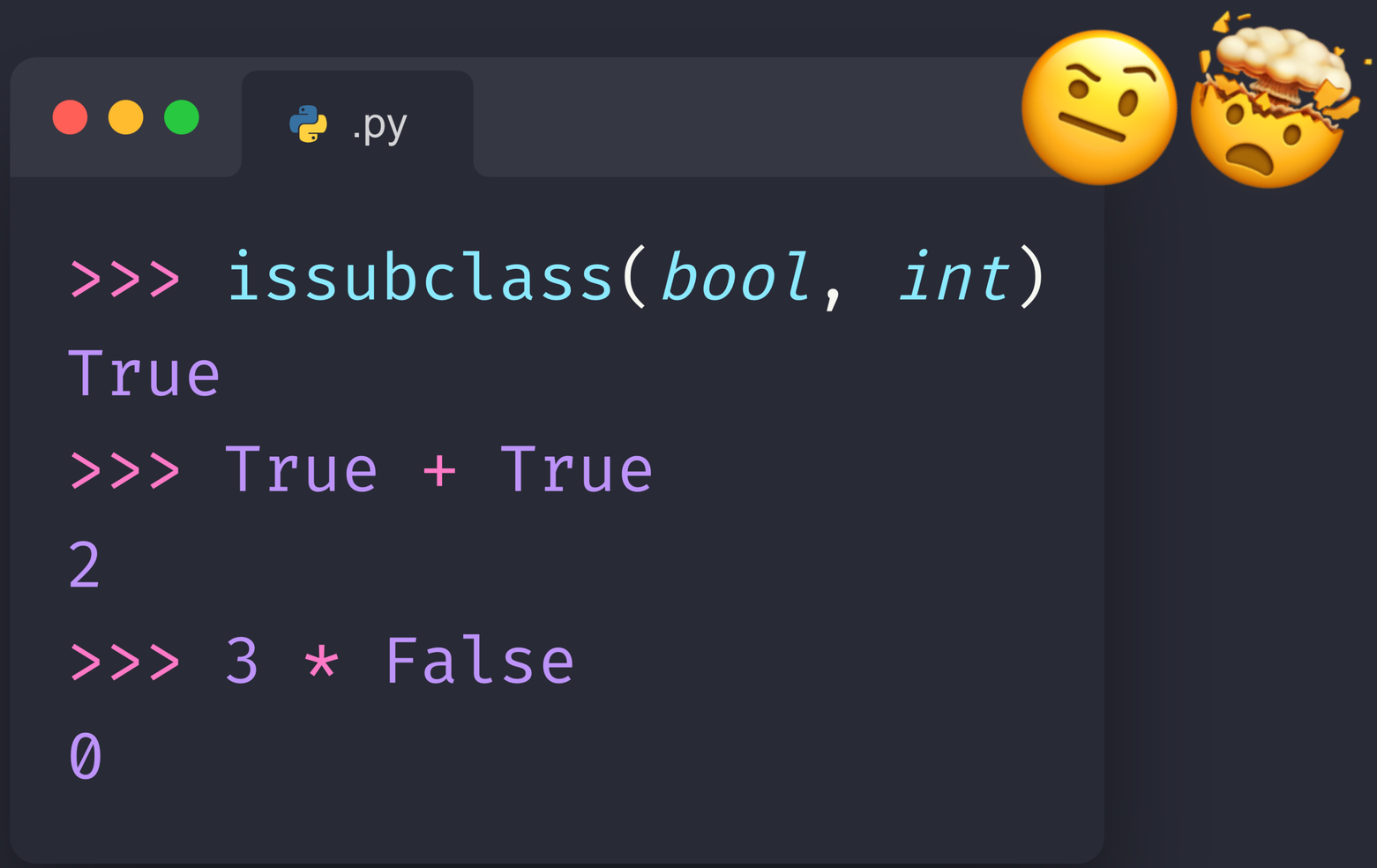

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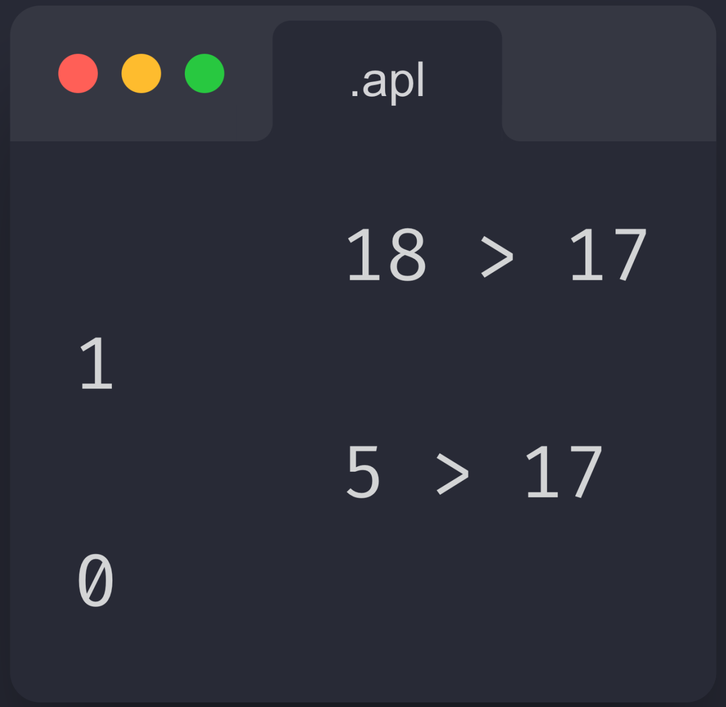

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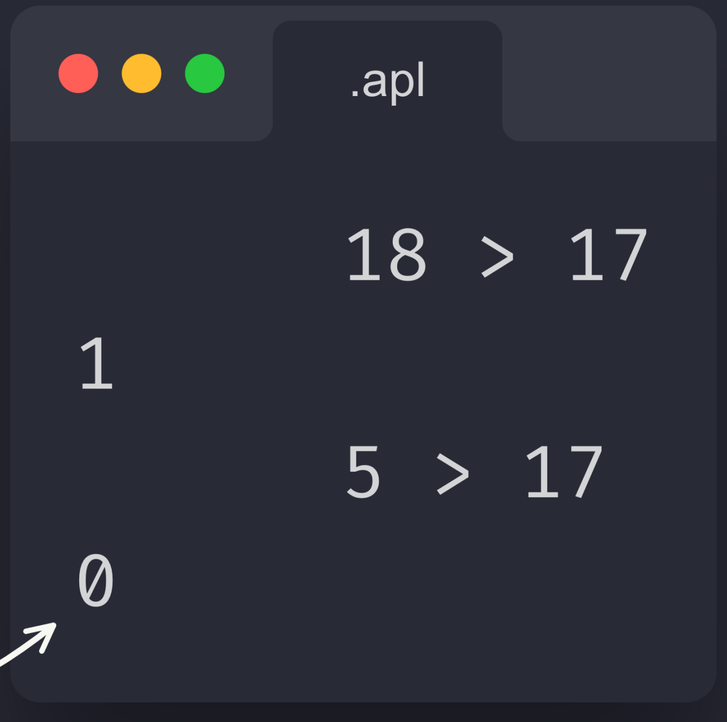
APL doesn't have Boolean values



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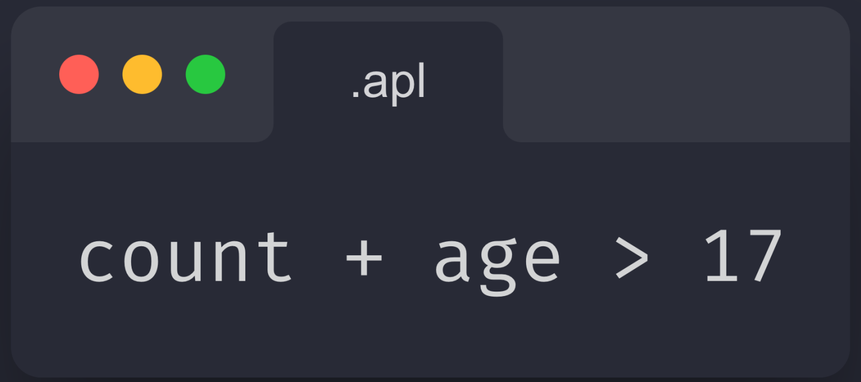

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.apl

```
count + age > 17
```

.py

```python
count = 0
for age in ages:
    count += 1 if age > 17 else 0
```

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.apl

```
count + age > 17
```

.py

```
count = 0
for age in ages:
    count += age > 17
```

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.apl

```
count + age > 17
```

.py

```
count = 0
for age in ages:
    count += age > 17
```

Using the Boolean directly

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.apl

```
count + age > 17
```

.py

```
count = 0
for age in ages:
    count += age > 17
```

Scalar functions & list comprehensions

Using the Boolean directly

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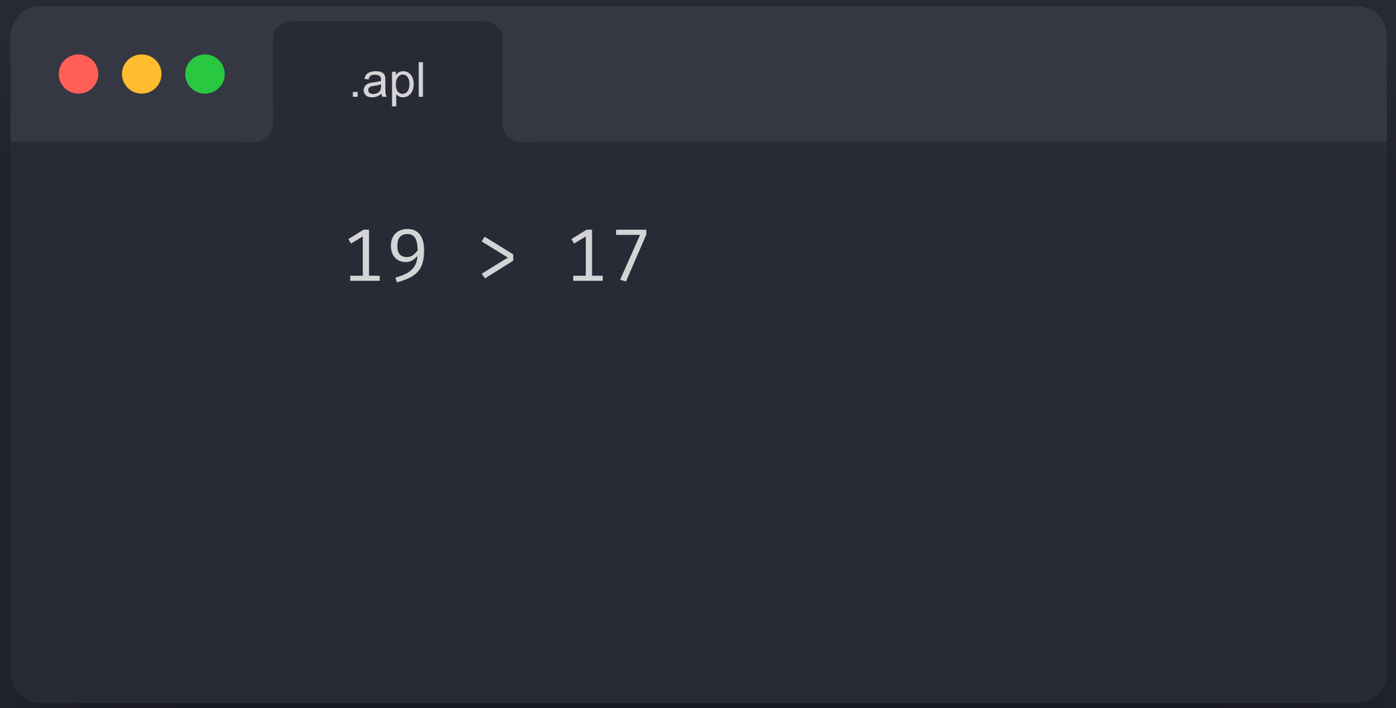

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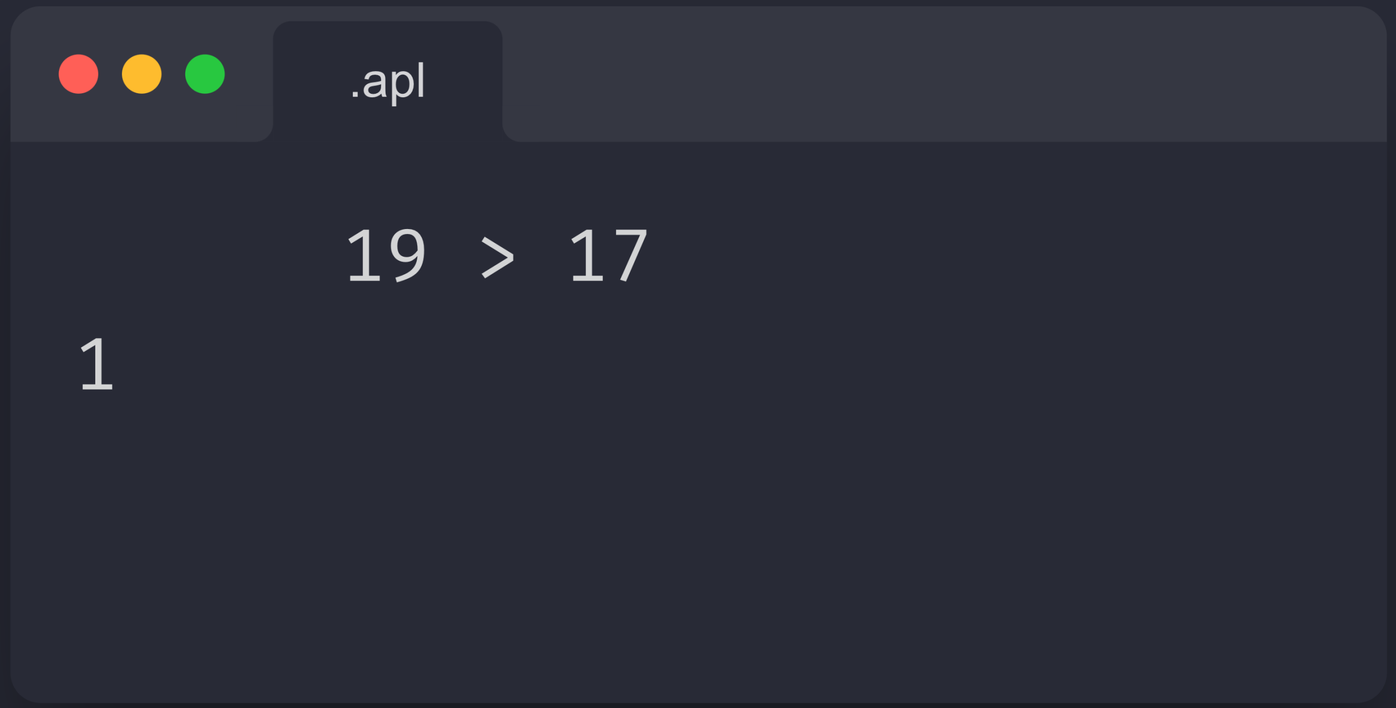

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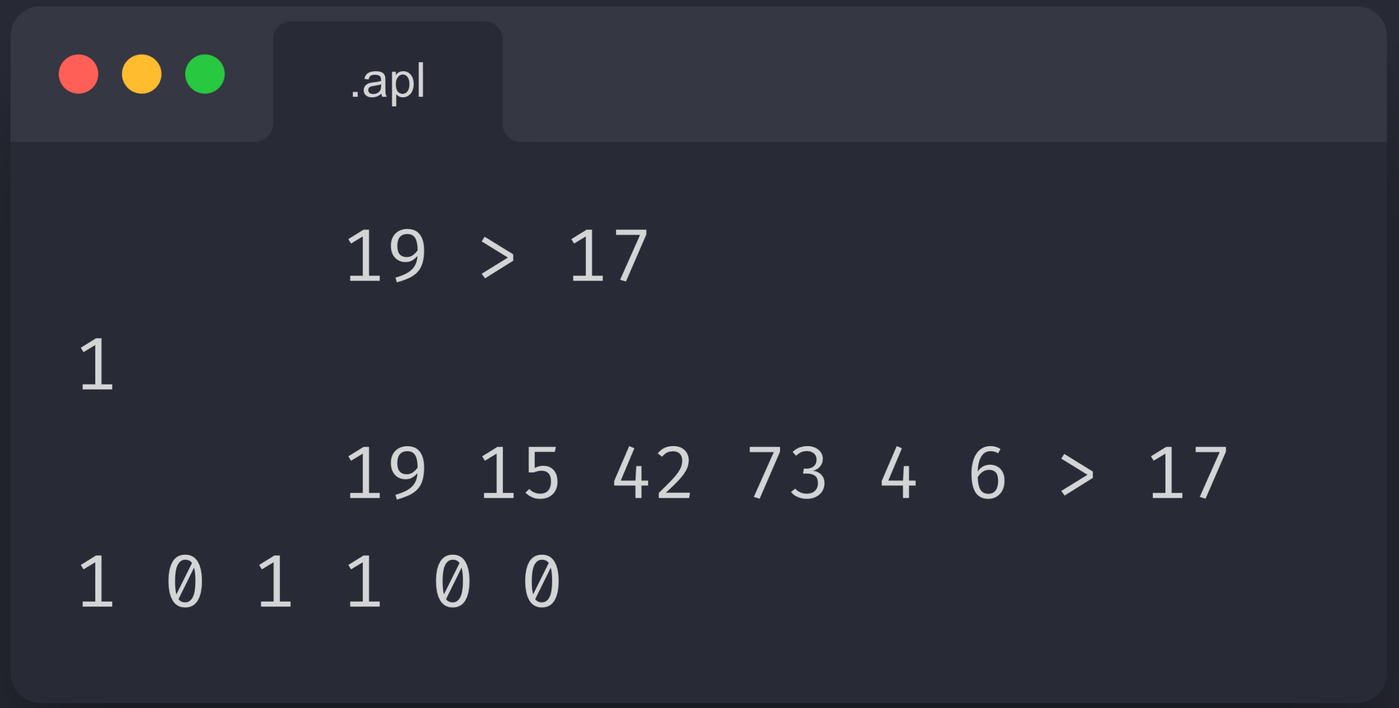

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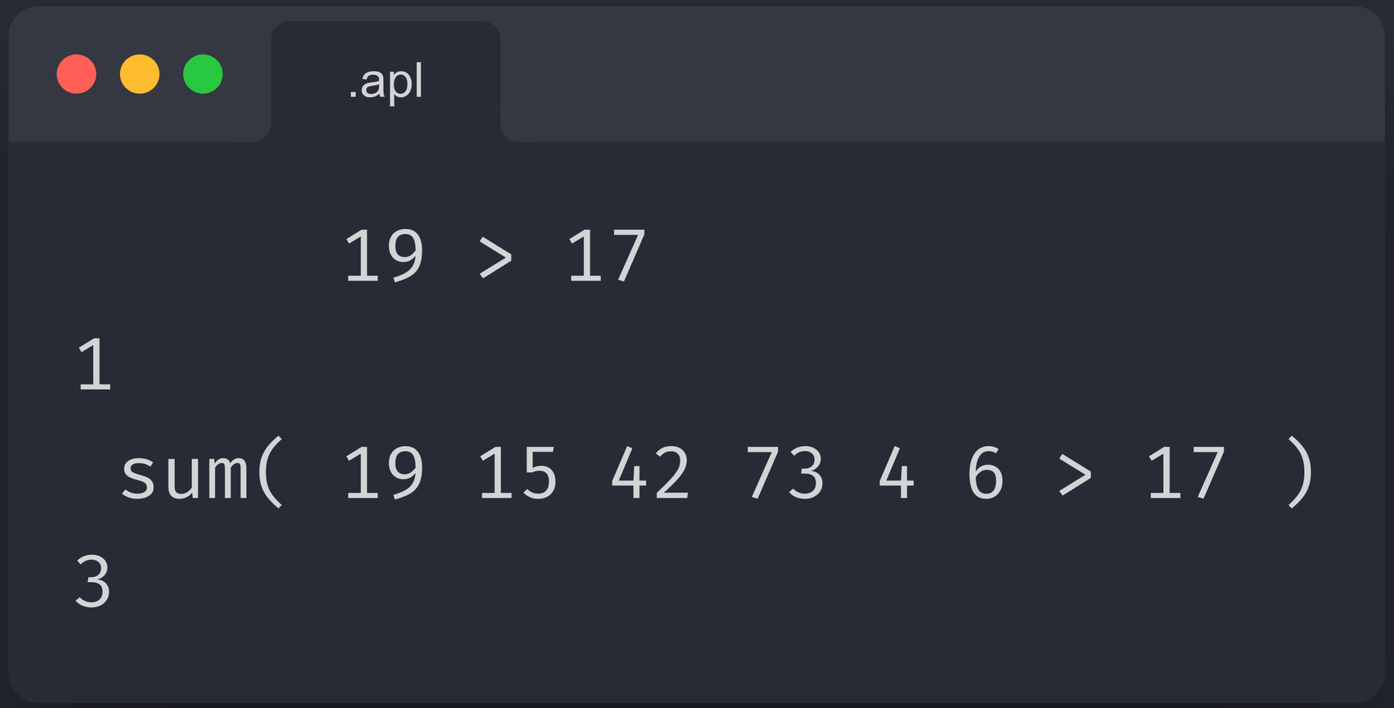

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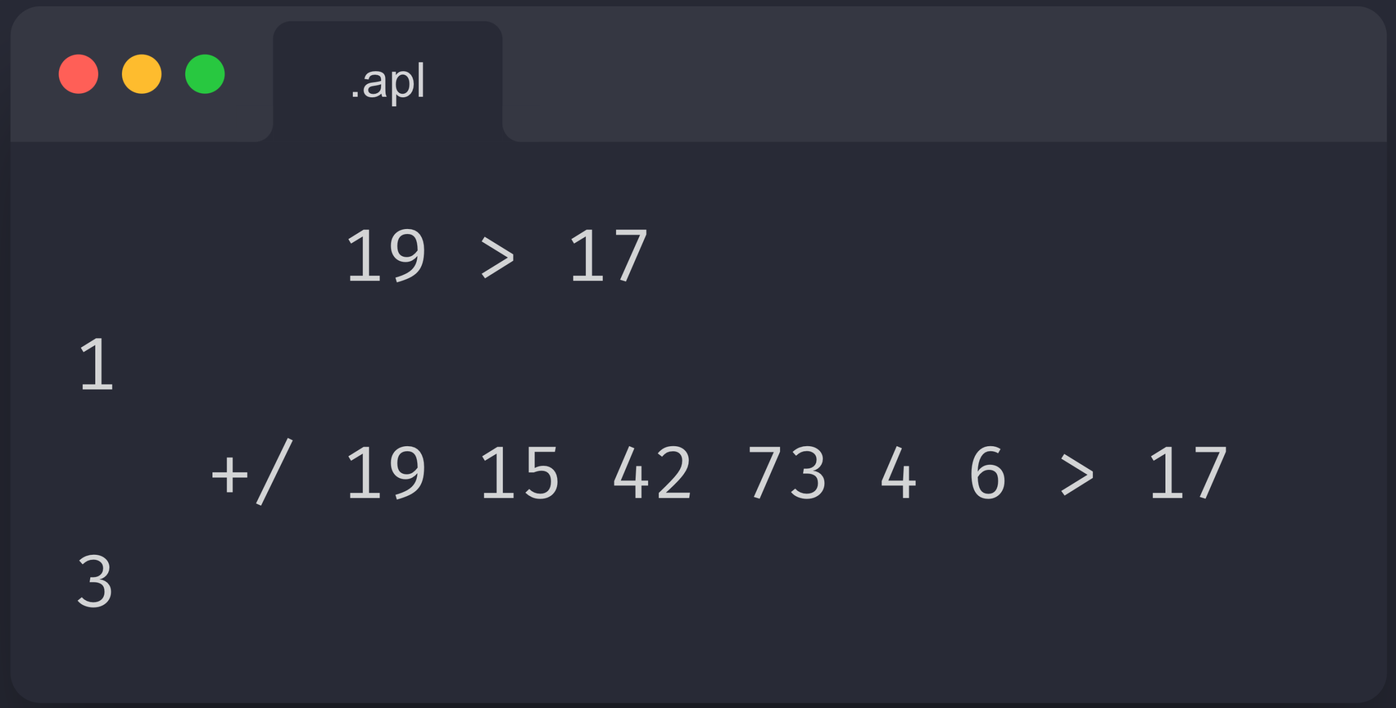

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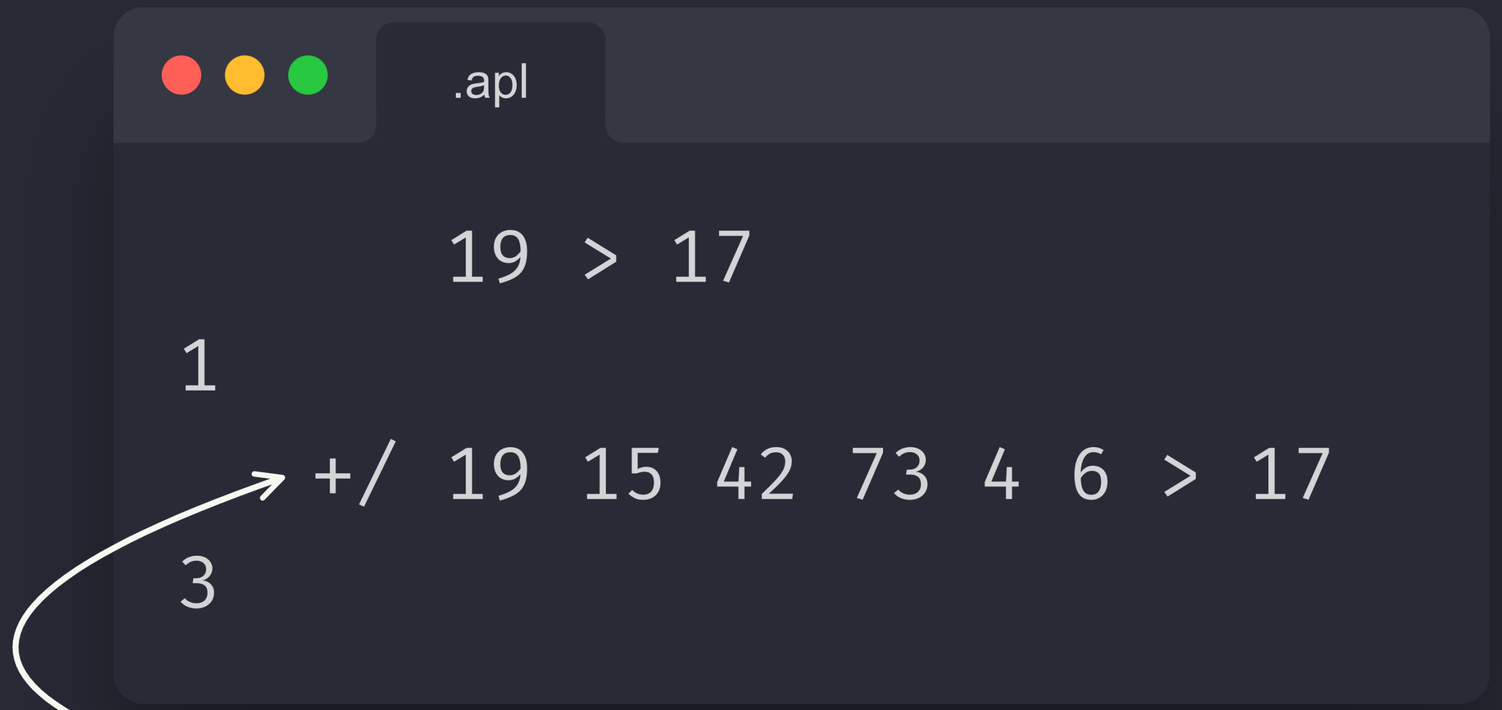

APL way of
counting things

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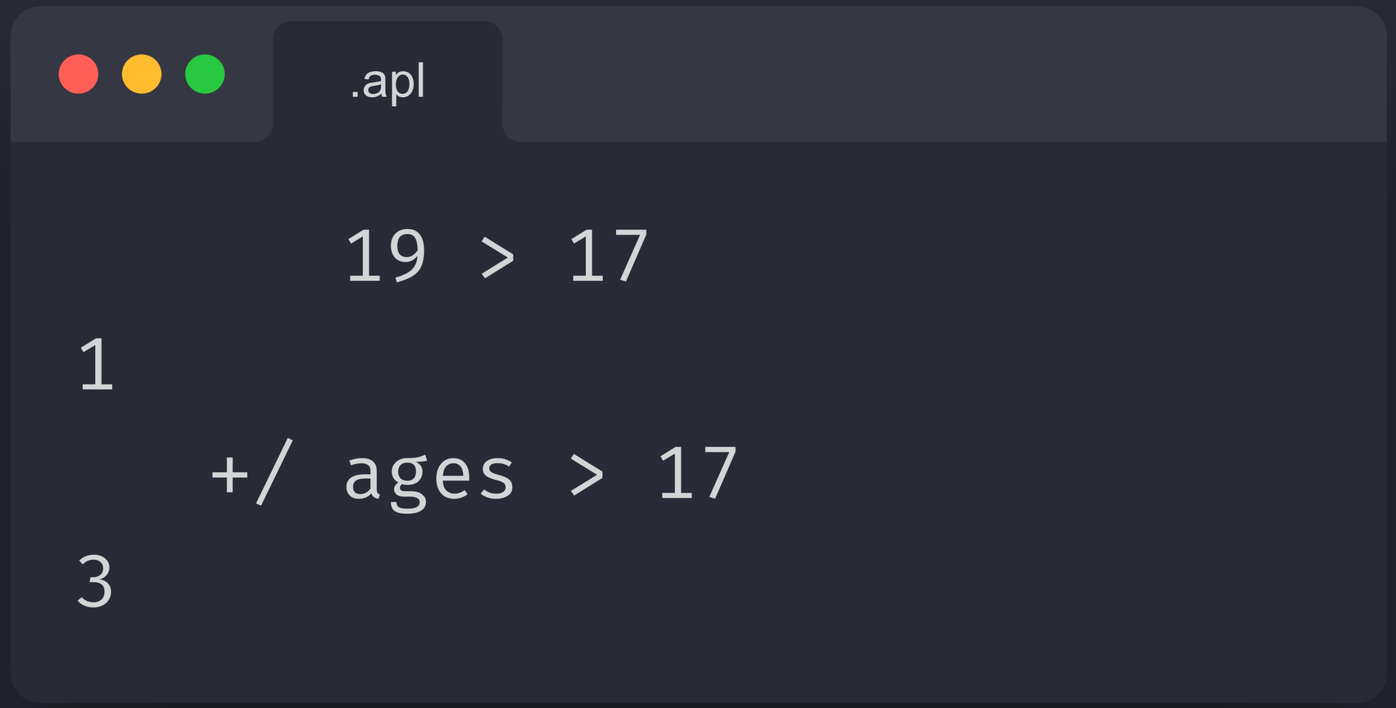

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.apl

```
+/ ages > 17
```

.py

```
sum(age > 17 for age in ages)
```

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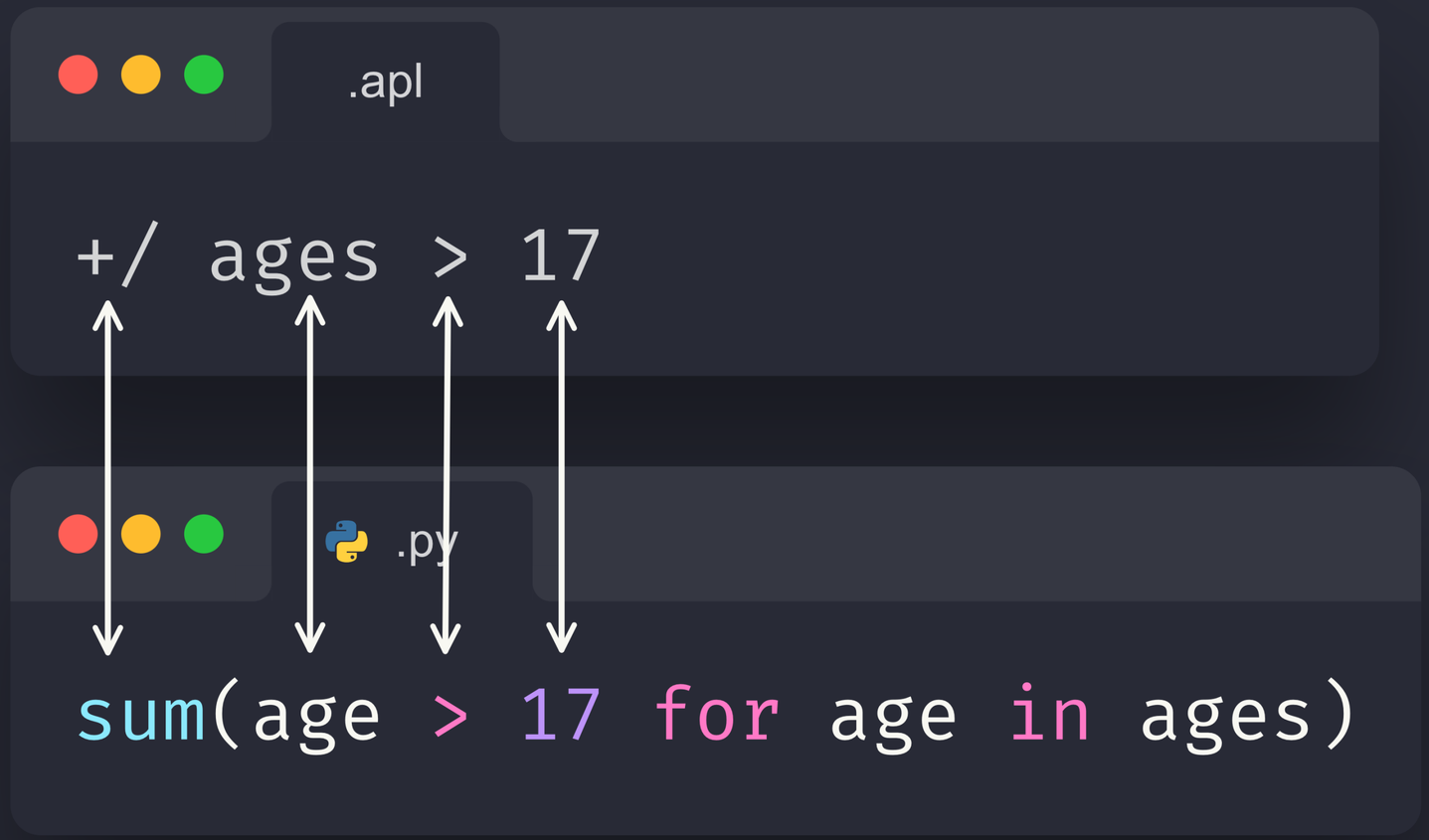

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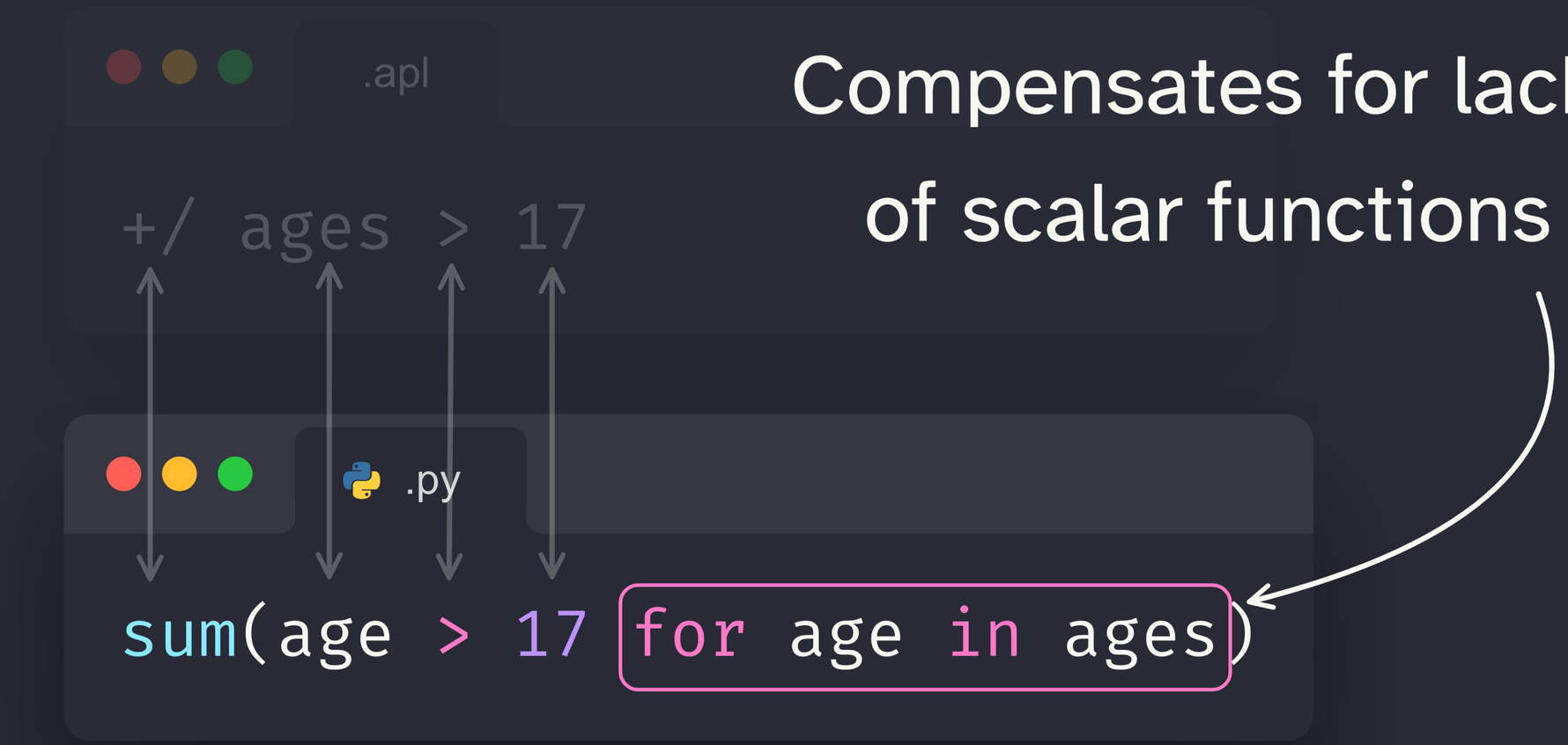

Compensates for lack of scalar functions

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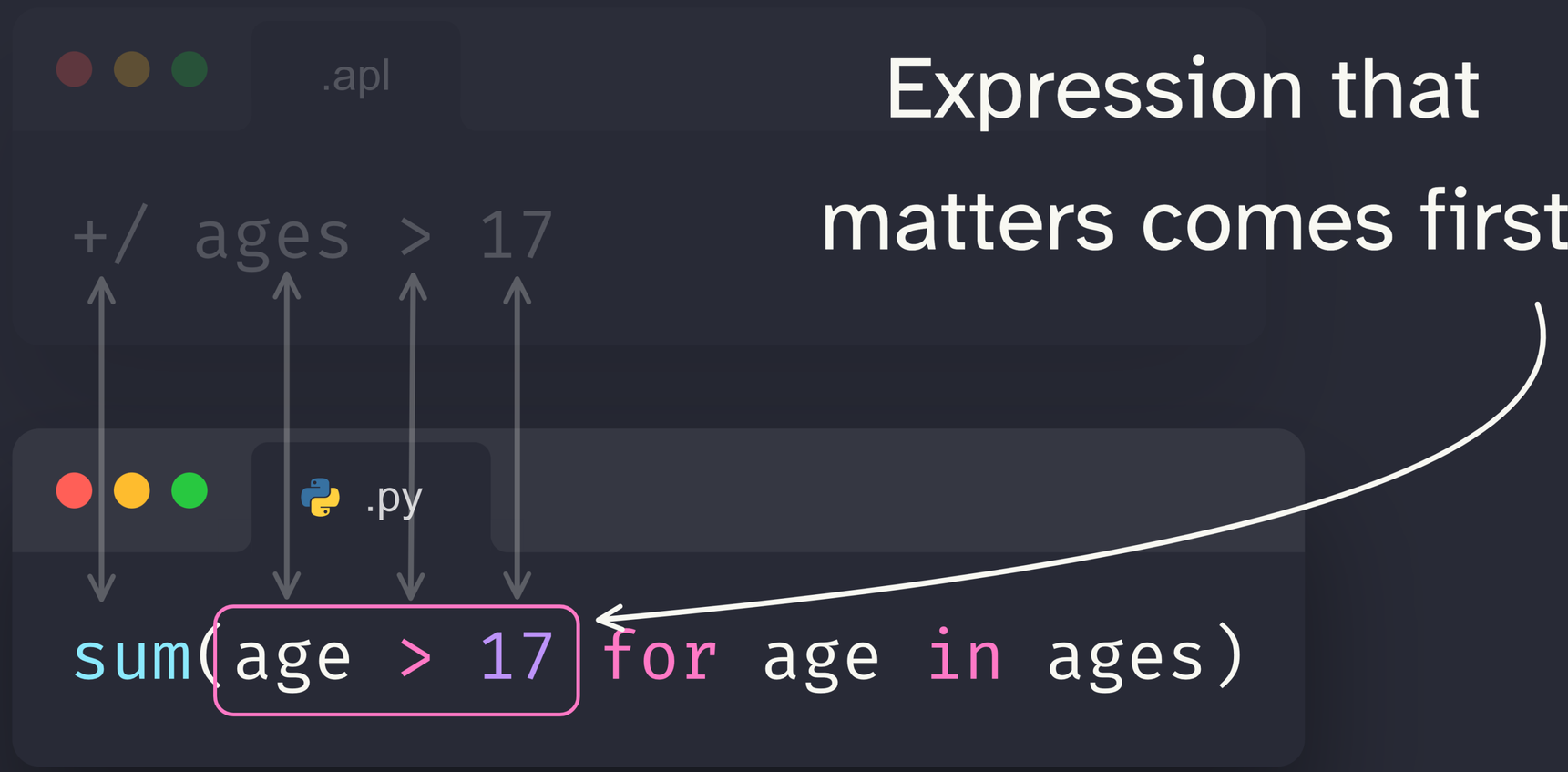

Expression that matters comes first

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Expression that matters comes first

.py

```
is_adult = [age > 17 for age in ages]
```

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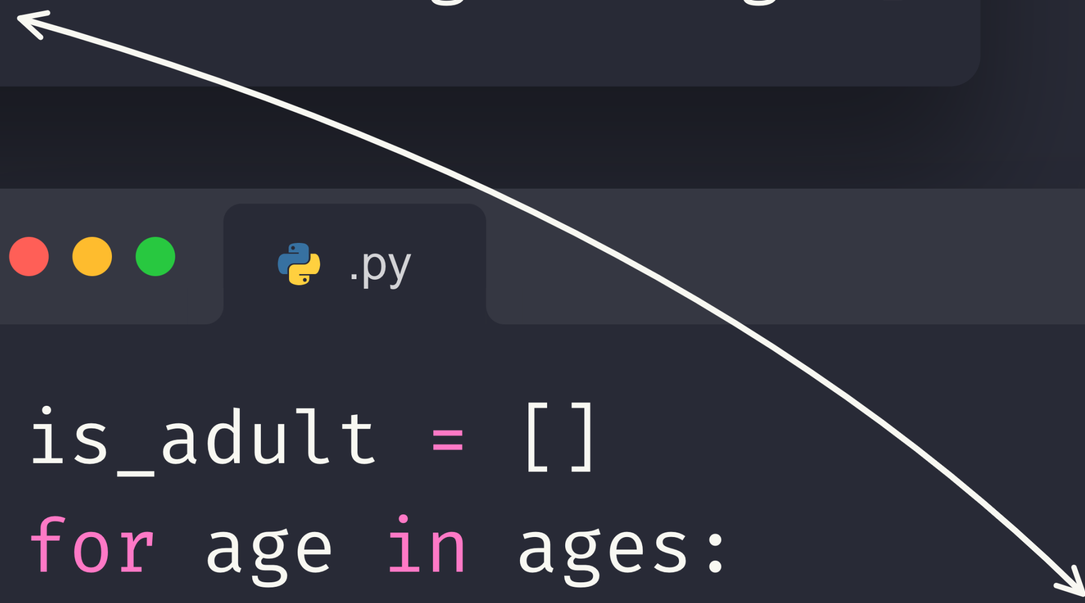
Expression that matters comes first

.py

```
is_adult = [age > 17 for age in ages]
```



.py

```
is_adult = []
for age in ages:
    is_adult.append(age > 17)
```

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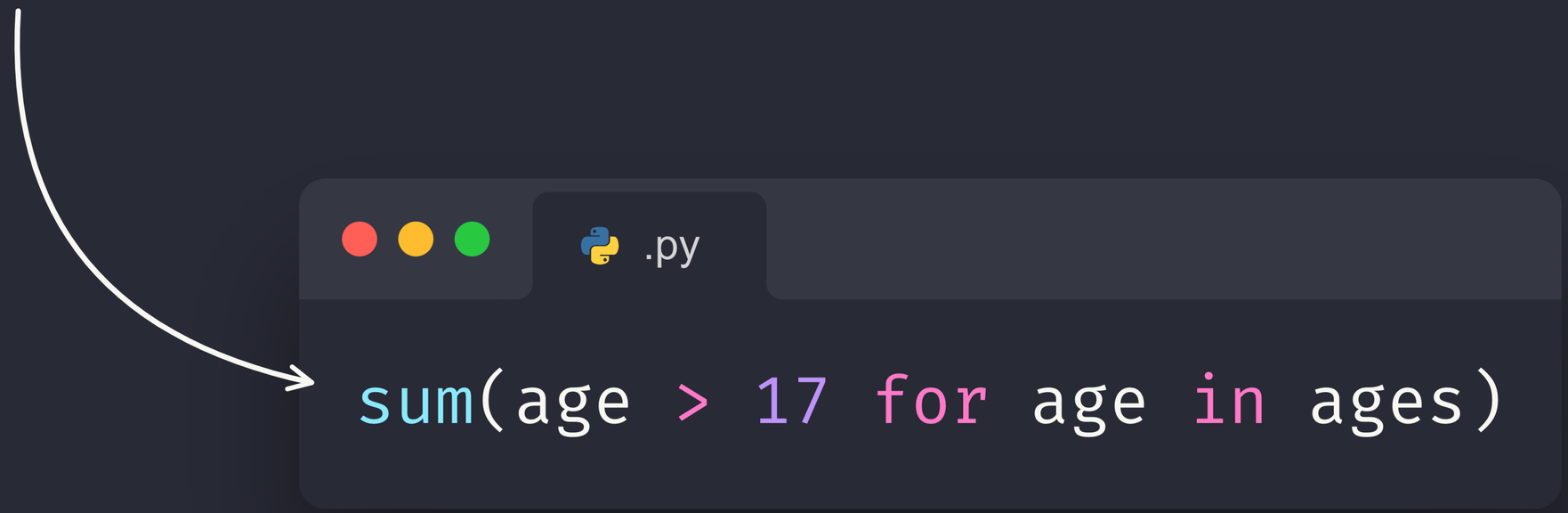
Recap

Reductions are everywhere



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Reductions are everywhere

Booleans, 0/1, and data-driven conditionals

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Reductions are everywhere

Scalar functions &
list comprehensions

Booleans, 0/1, and data-driven conditionals

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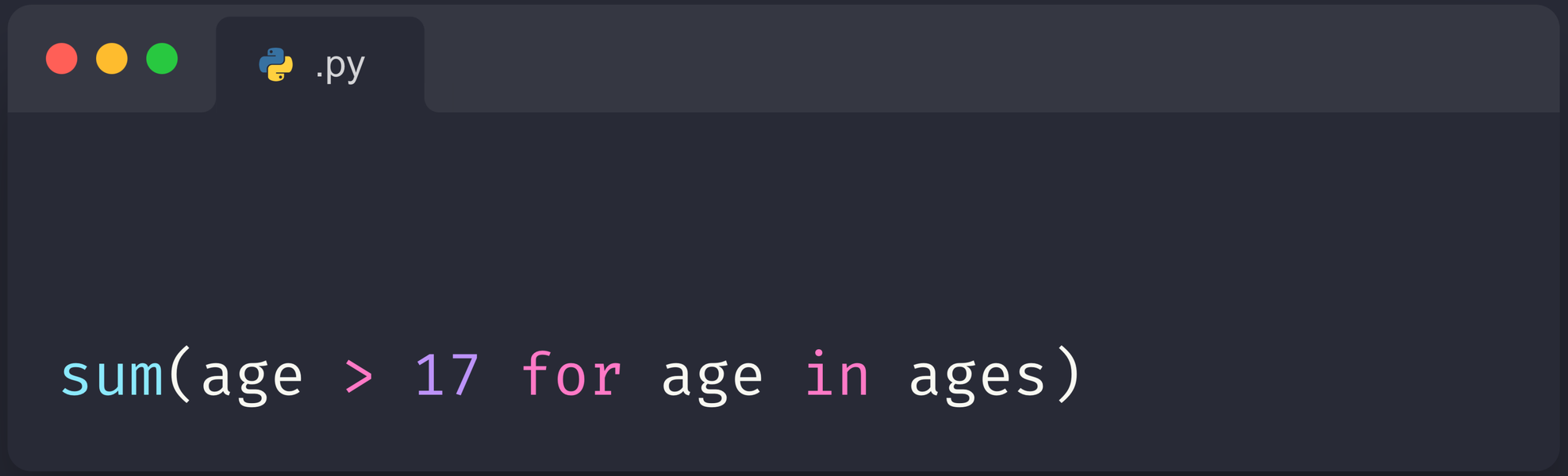

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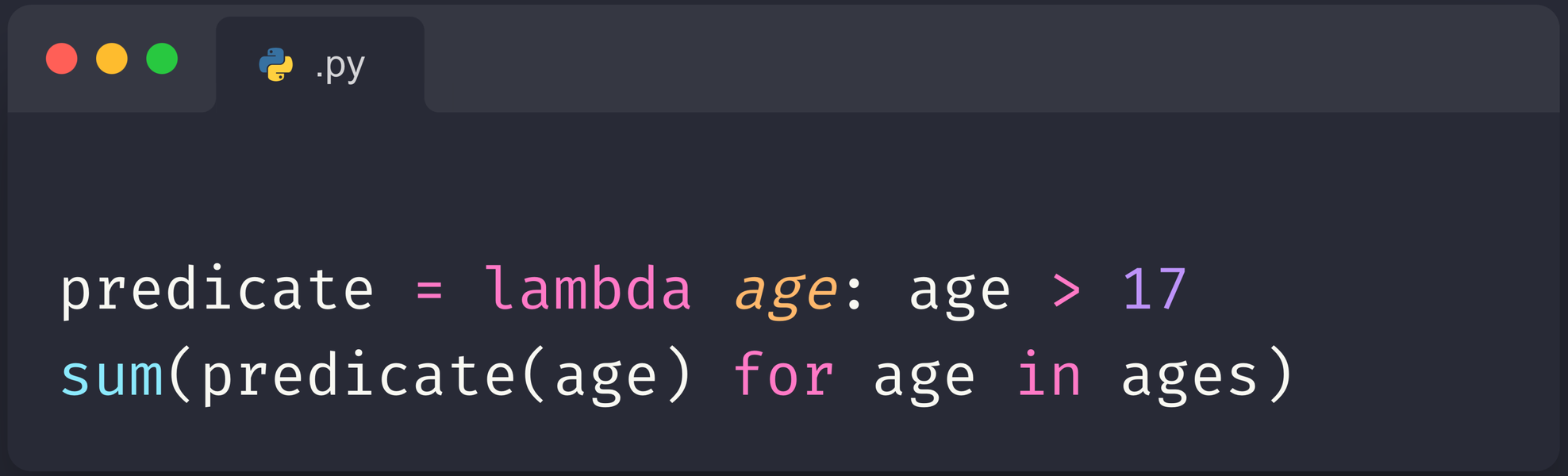

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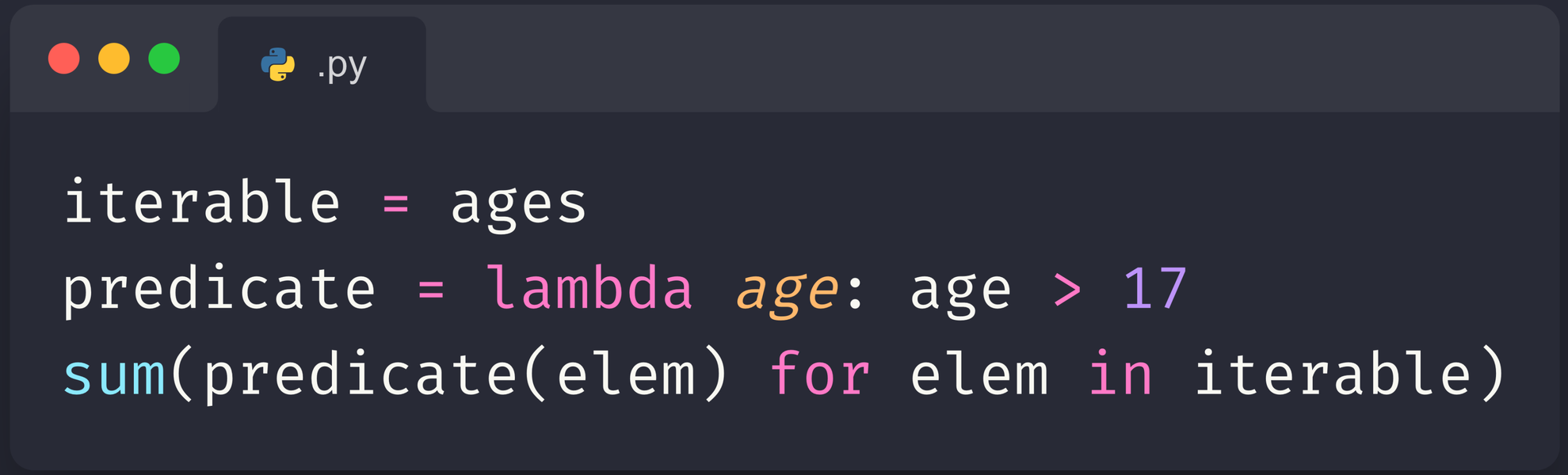

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.py

```
iterable = ages
predicate = lambda age: age > 17
sum(predicate(elem) for elem in iterable)
```

Idiom: count elements that satisfy `predicate`.

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“[…] Accumulate idioms. […] The only difference between Shakespeare and you was the size of his idiom list […]”

— Alan J. Perlis

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presented with  snappify*

*no affiliation, they're just awesome

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