Lecture 16: Object-Oriented Programming II

Marvin Zhang
07/19/2016

Announcements

Survey Responses (Thanks!)

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Highlights from the survey:

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- Homework 3 and Quiz 4 were so hard!
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  - We will do coding quizzes a little differently

More Survey Responses

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- 1/6 students came to the potluck, 5/6 want another one

Roadmap

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Functions

Data

Mutability

Objects

Interpretation

Paradigms

Applications

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- This week (Objects), the goals are:
  - To learn the paradigm of *object-oriented programming*
  - To study applications of, and problems that be solved using, OOP

Inheritance

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class <new class>(<base class>):
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- The new class *shares* attributes with the base class, and *overrides* certain attributes
- Implementing the new class is now as simple as specifying how it's *different* from the base class

Inheritance Example

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class Pokemon:
    """A Pokemon."""
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Designing for Inheritance

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class ElectricType(Pokemon):
    basic_attack = 'thunder shock'
    prob = 0.1
    def attack(self, other):
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- Don’t repeat yourself! Use *existing implementations*

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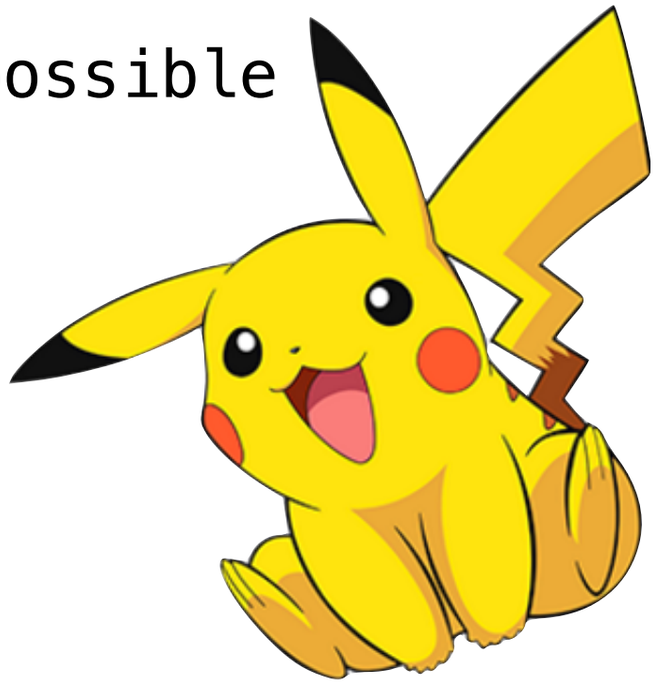

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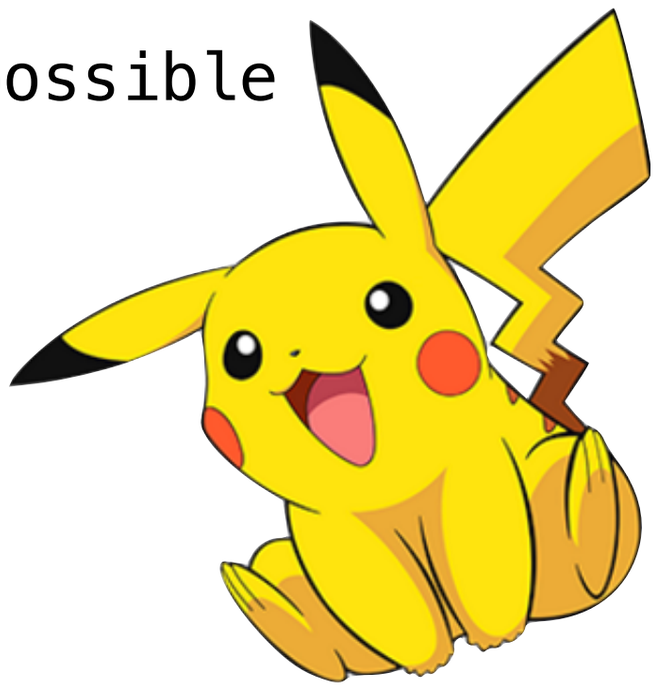

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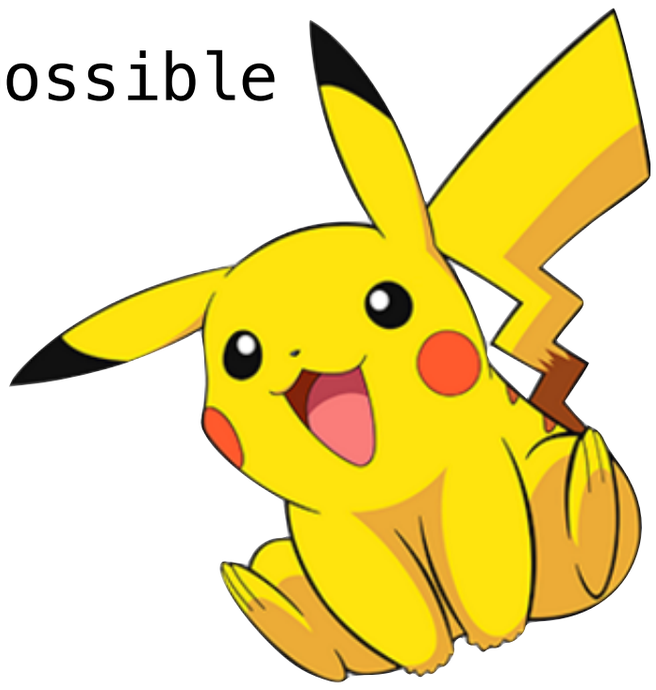

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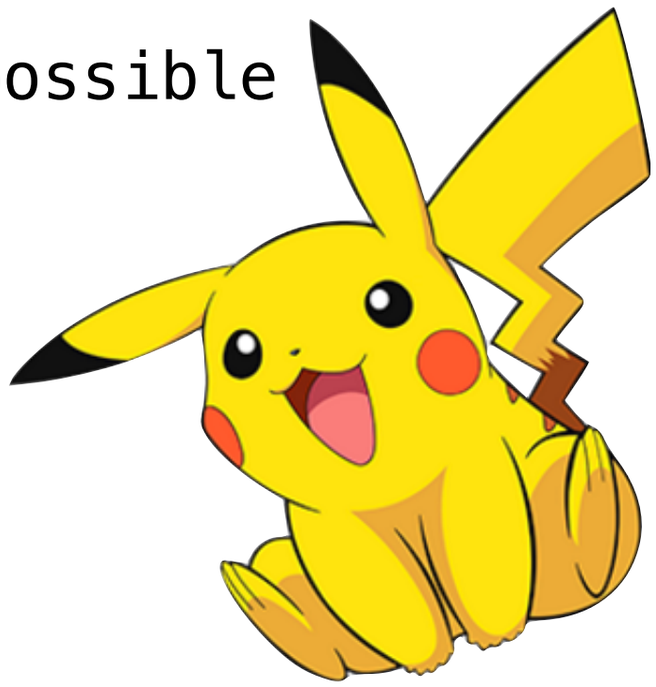

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class FlyingType(Pokemon):
    basic_attack = 'peck'
    damage = 35
    def fly(self, location):
        print(self.trainer, 'flew to', location)
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class Zapdos(ElectricType, FlyingType):
    basic_attack = 'thunder'
    damage = 120
    def speak(self):
        print('EEEEEEEEE')
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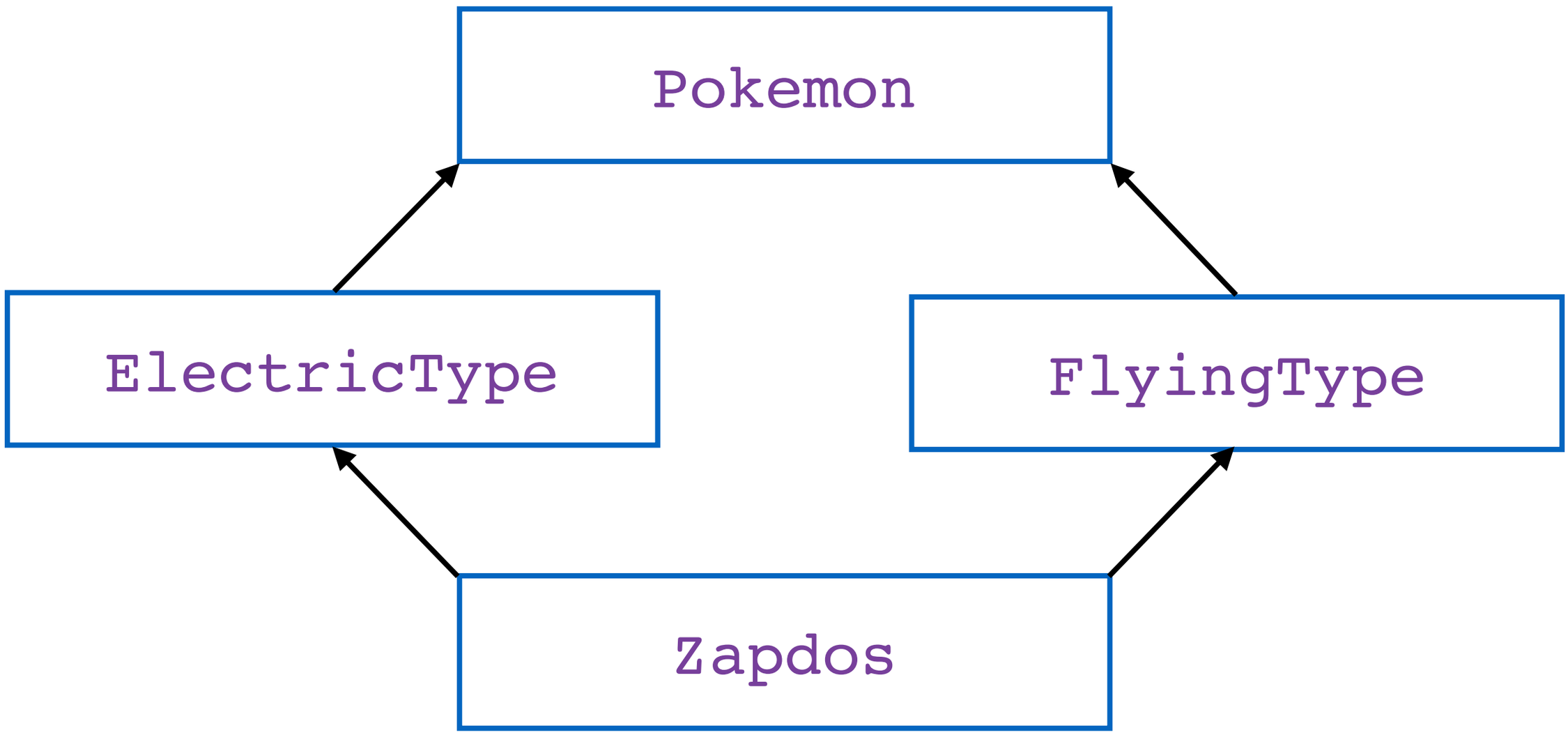

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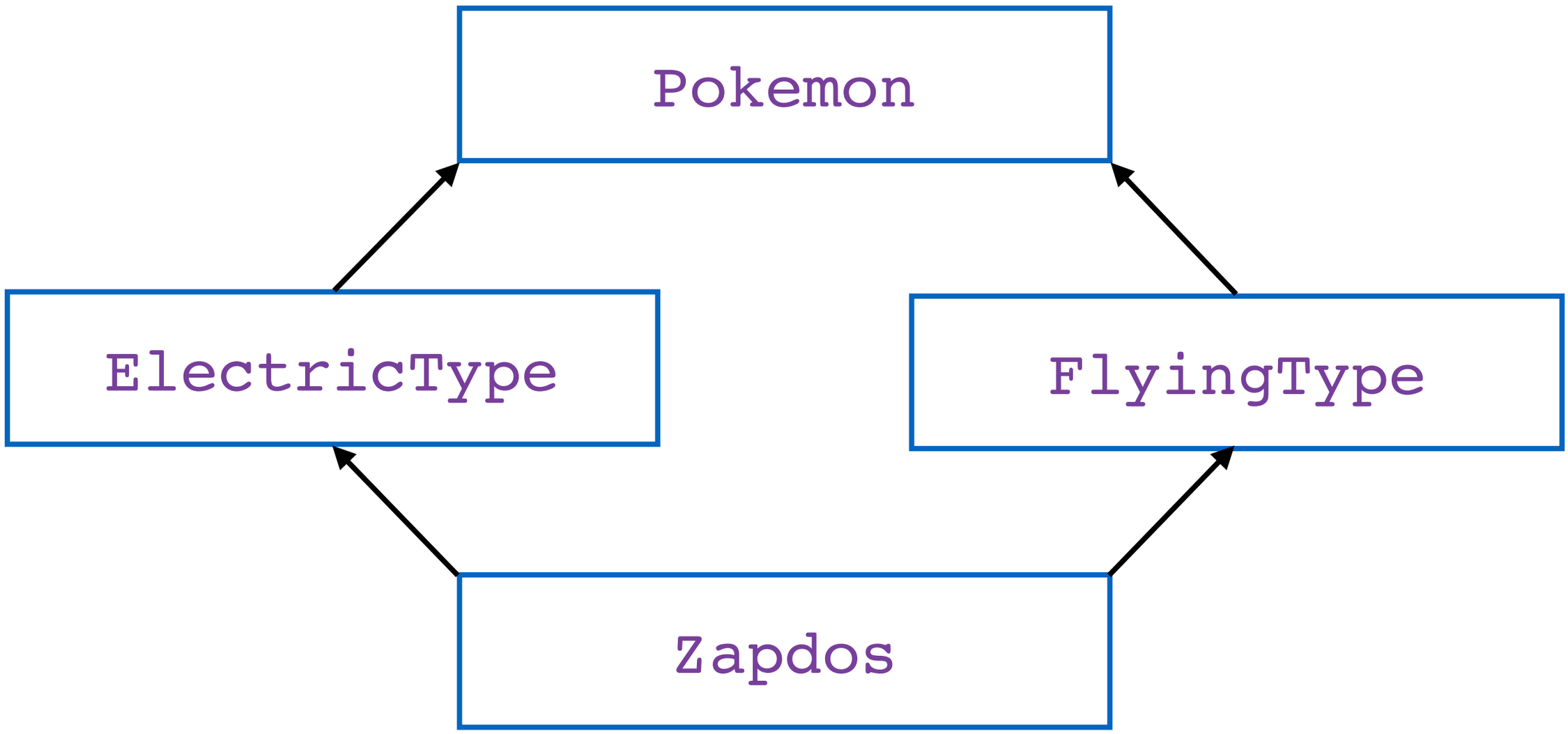

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- Good design is a bigger topic in future classes

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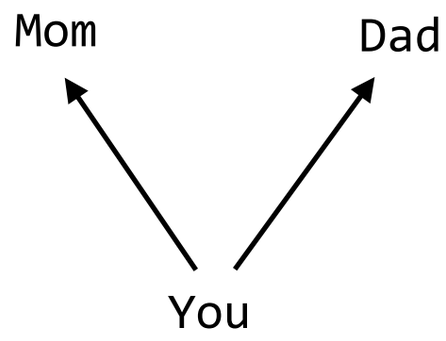

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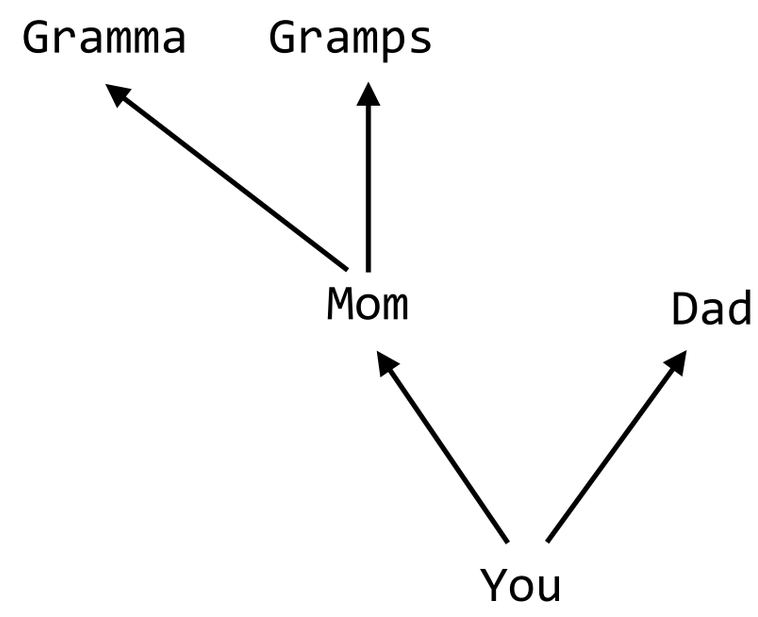

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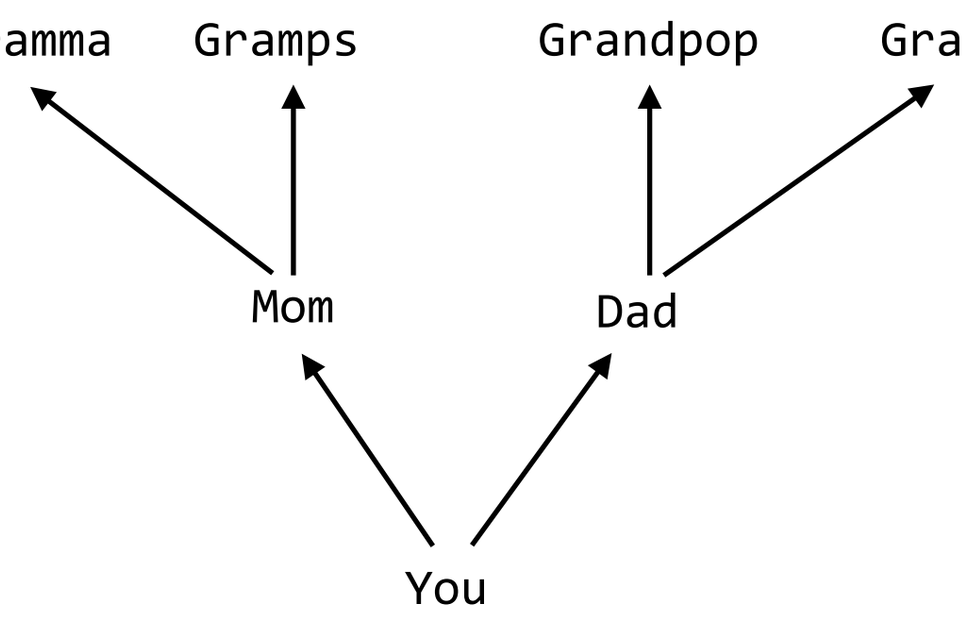

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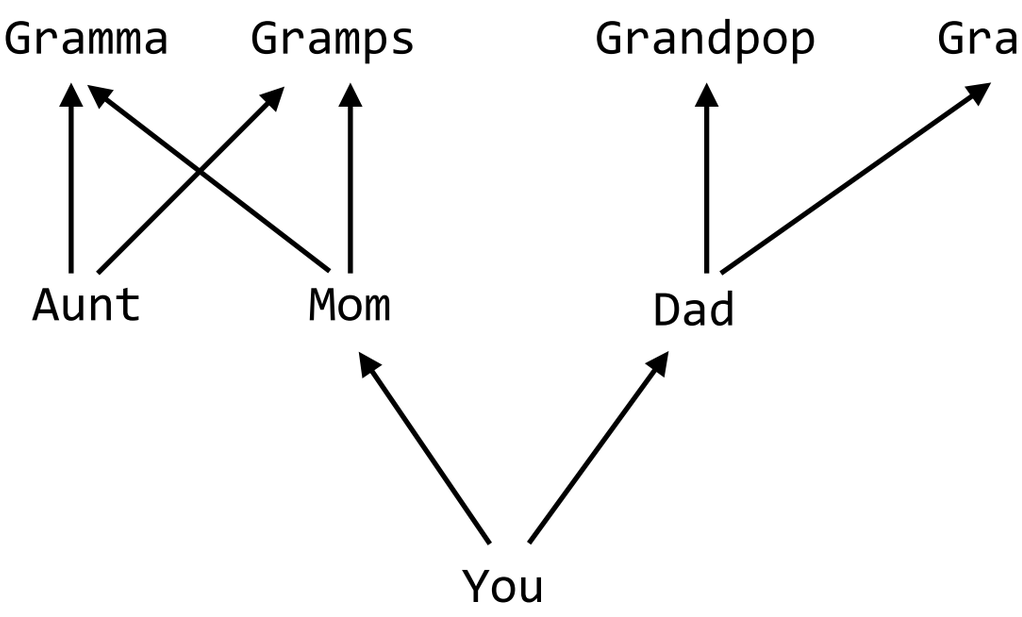

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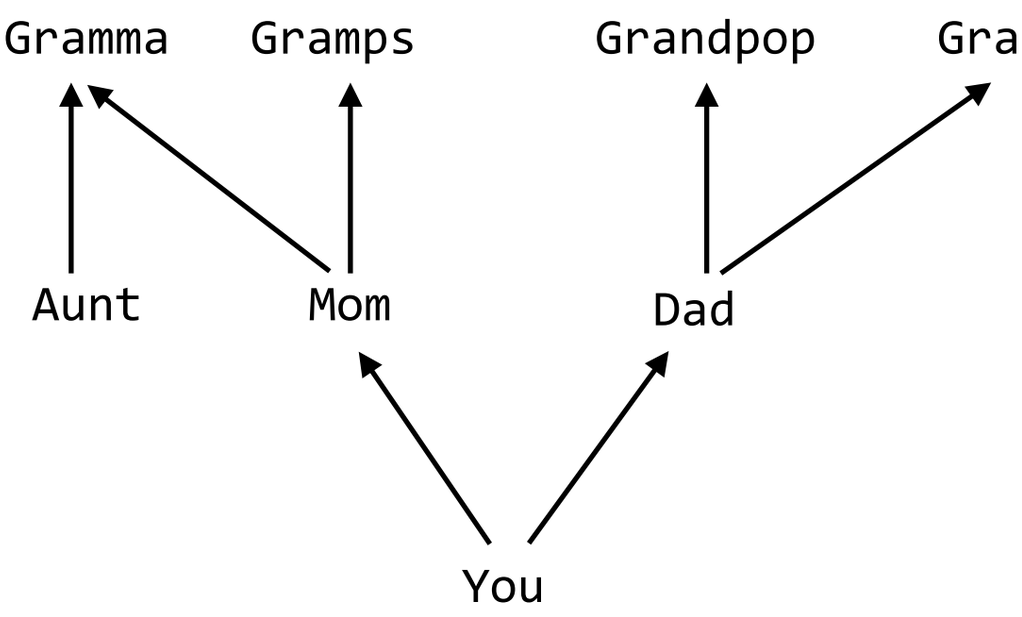

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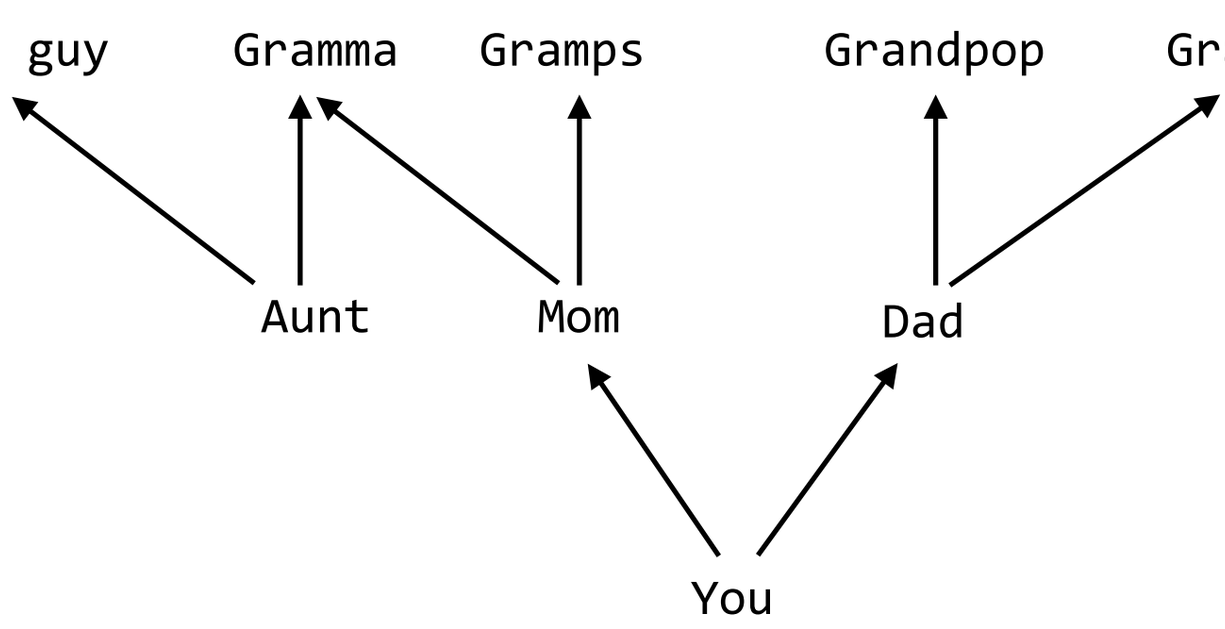

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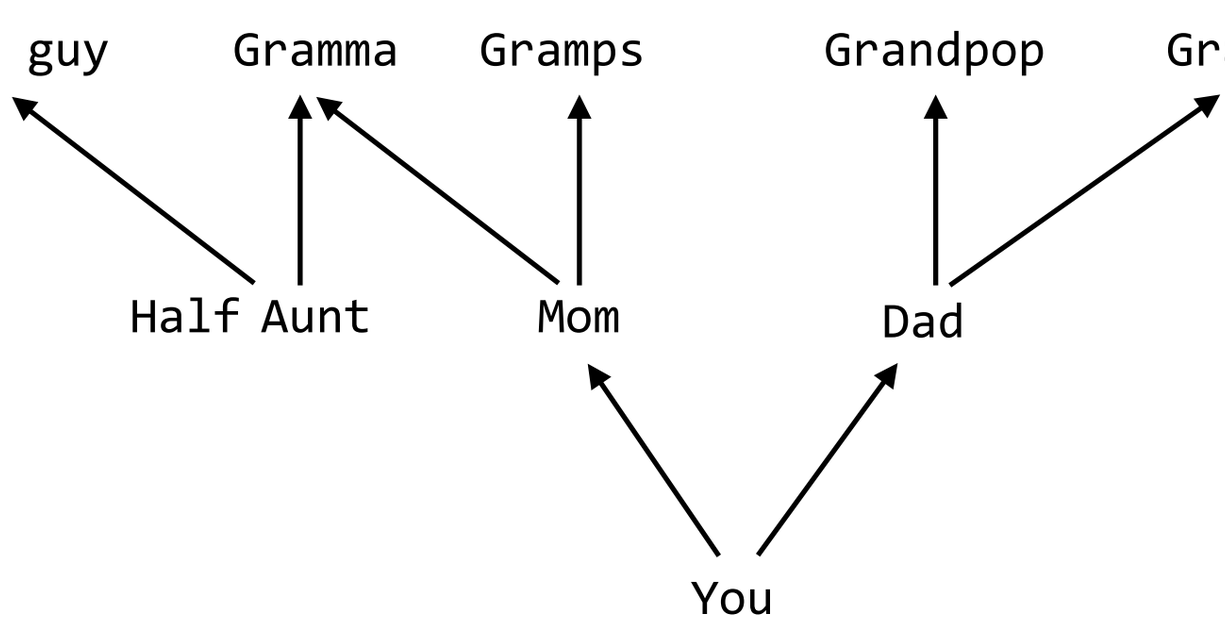

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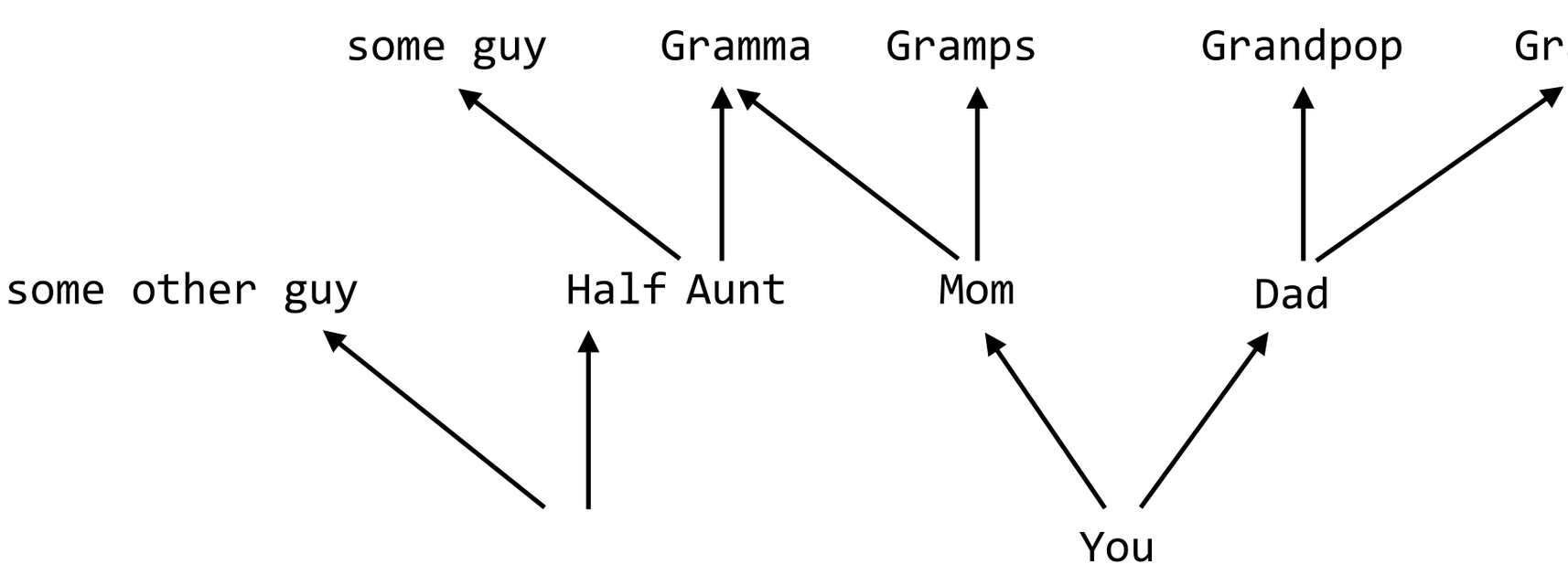

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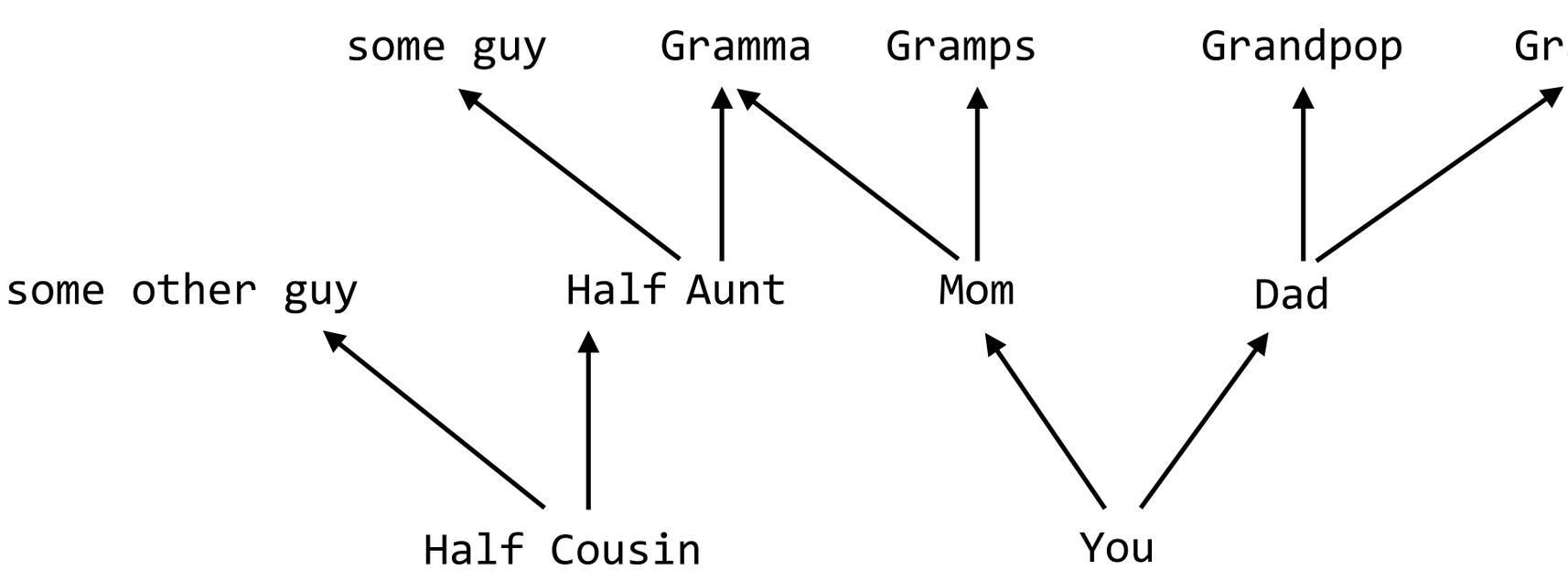

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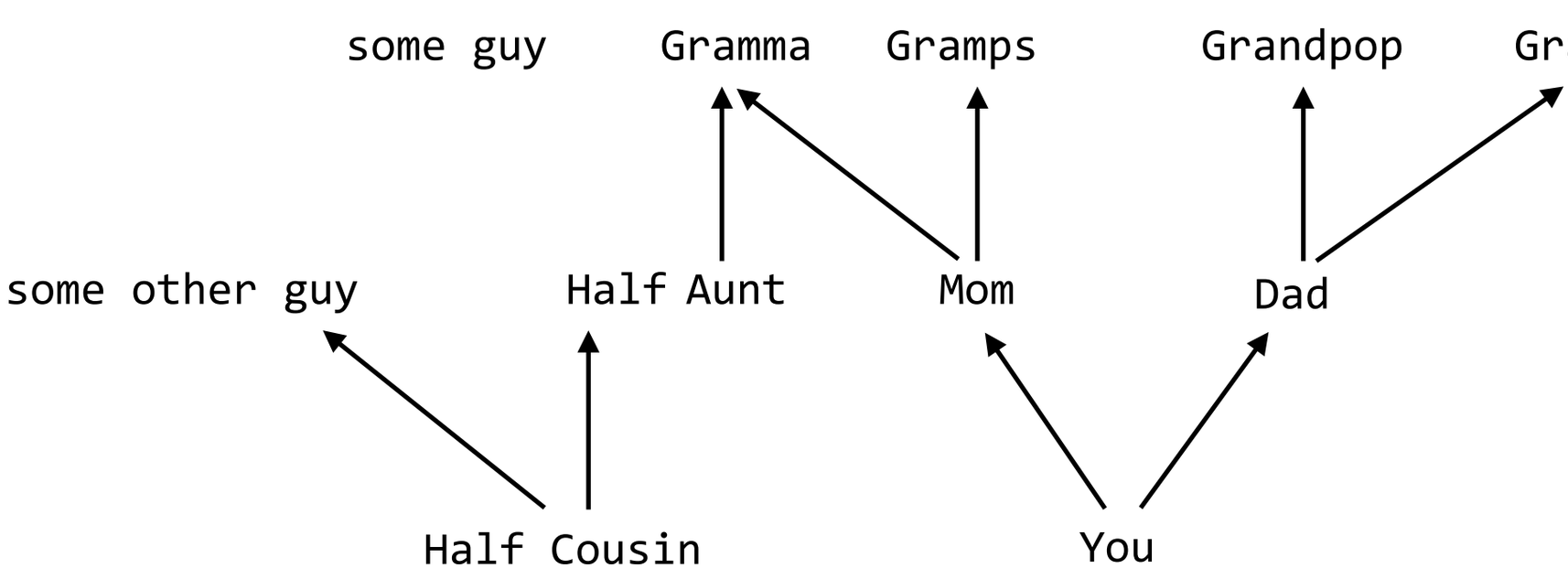

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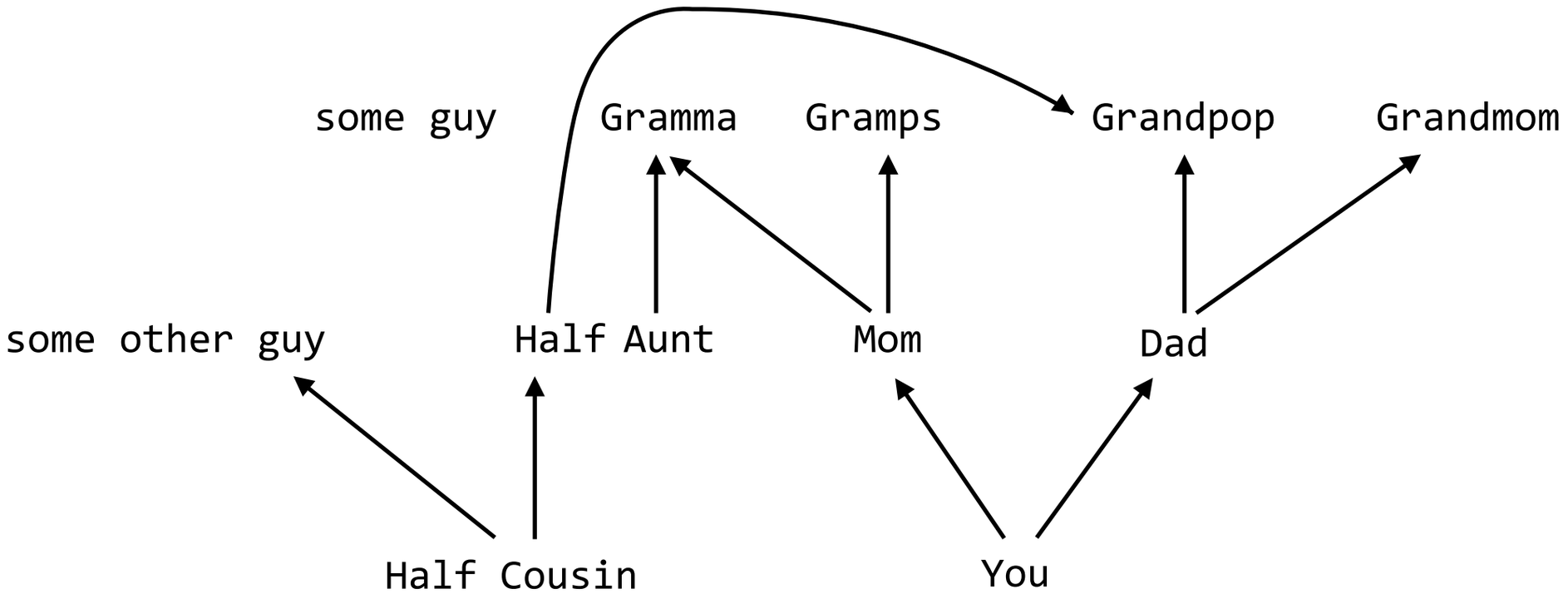

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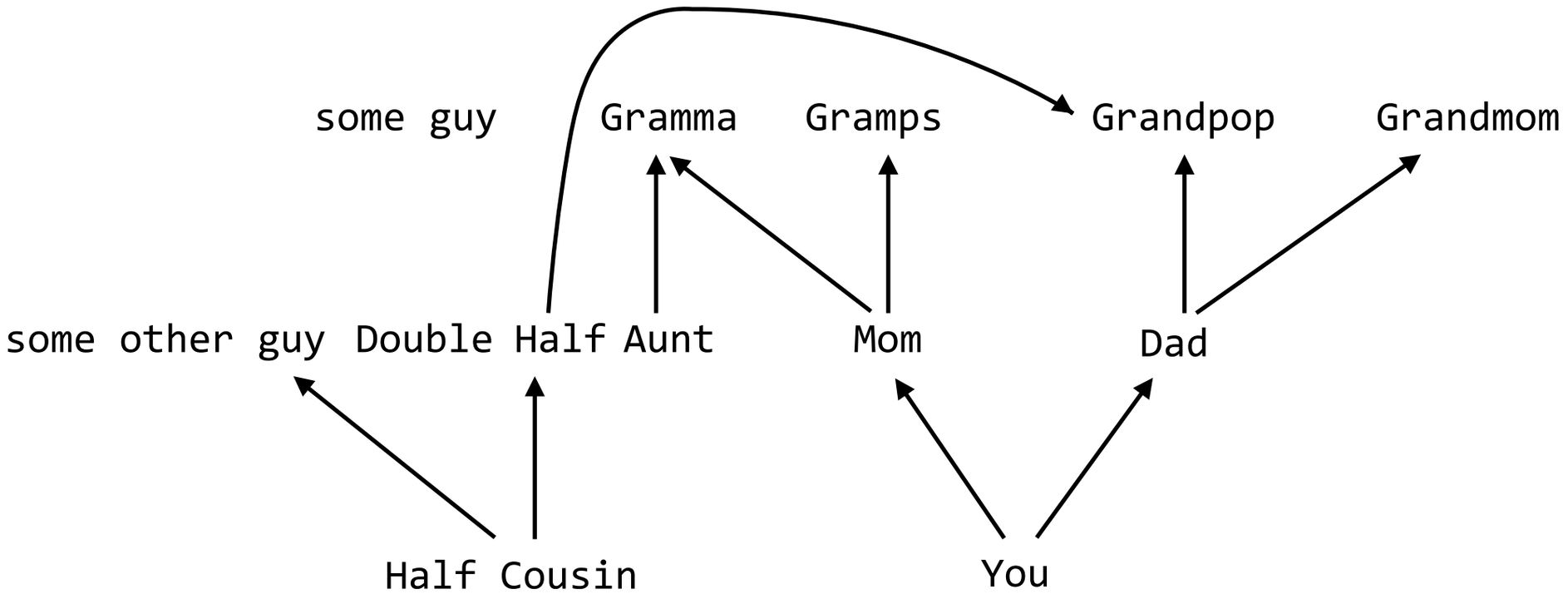

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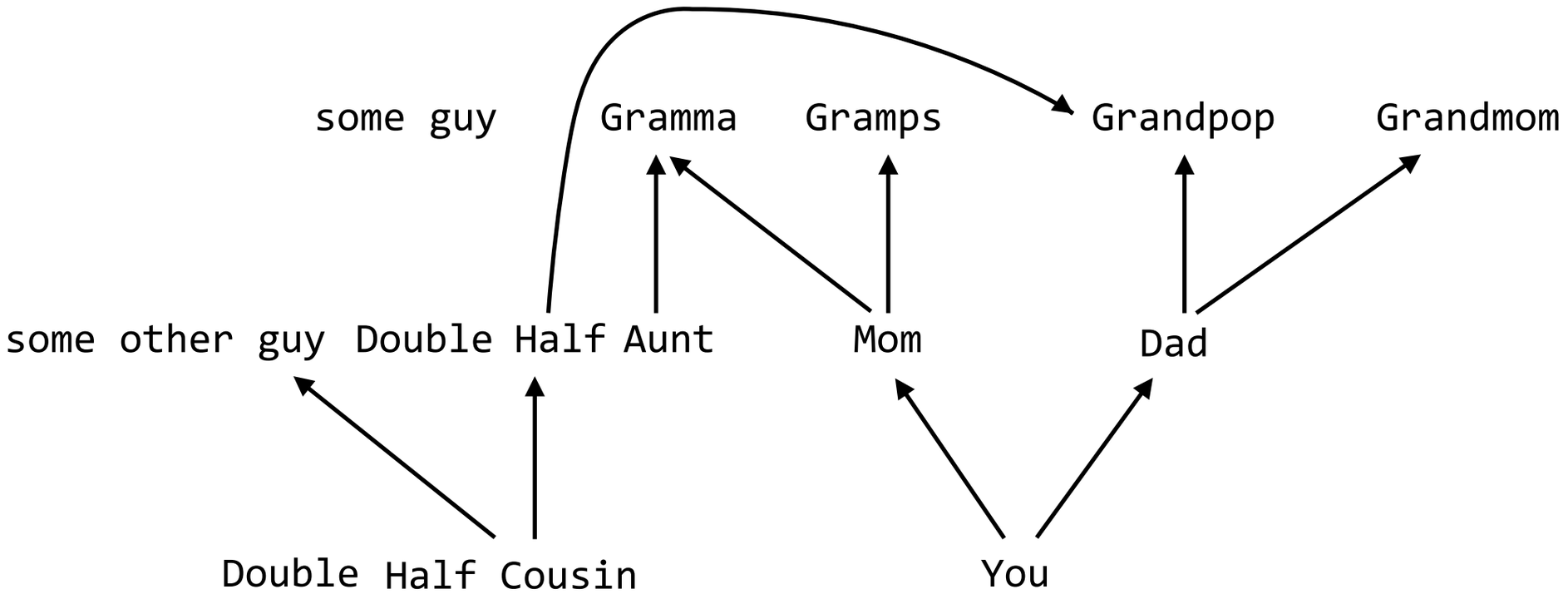

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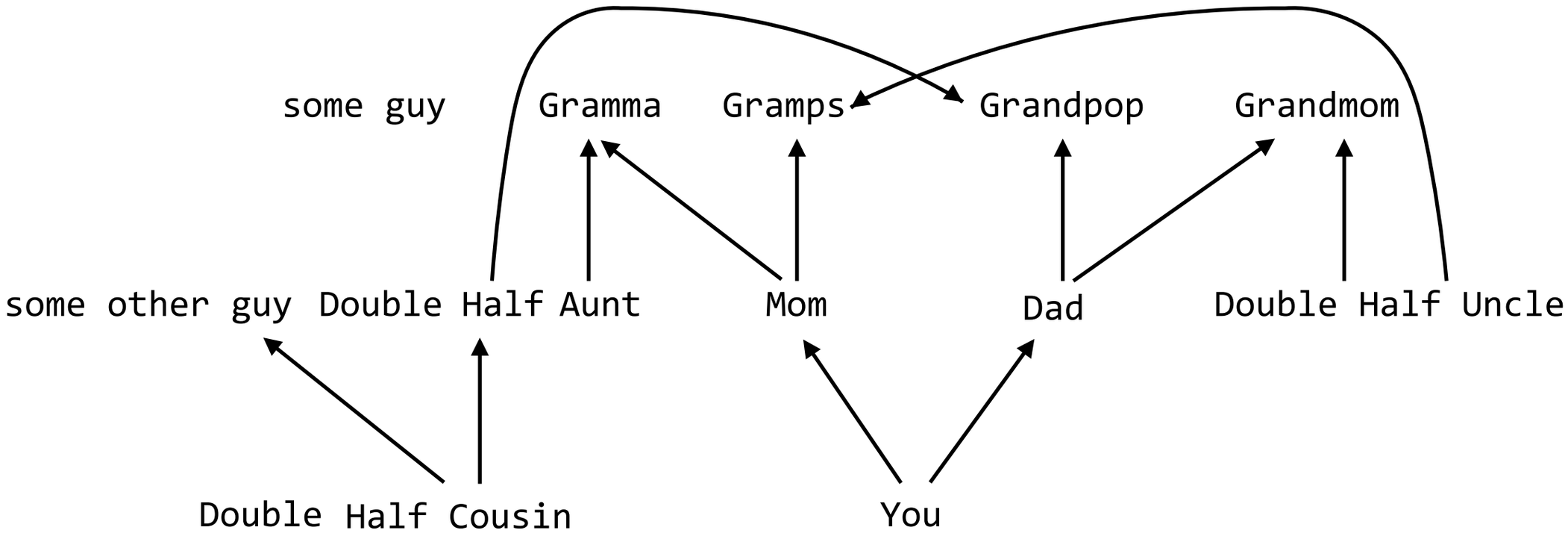

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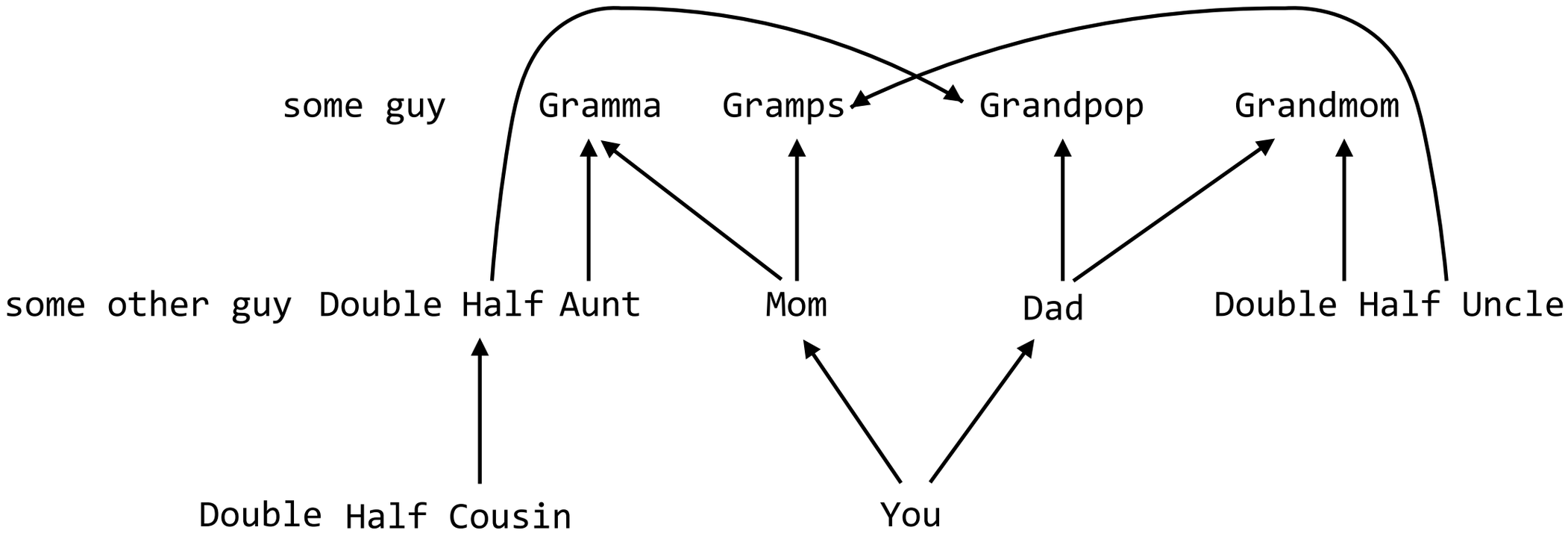

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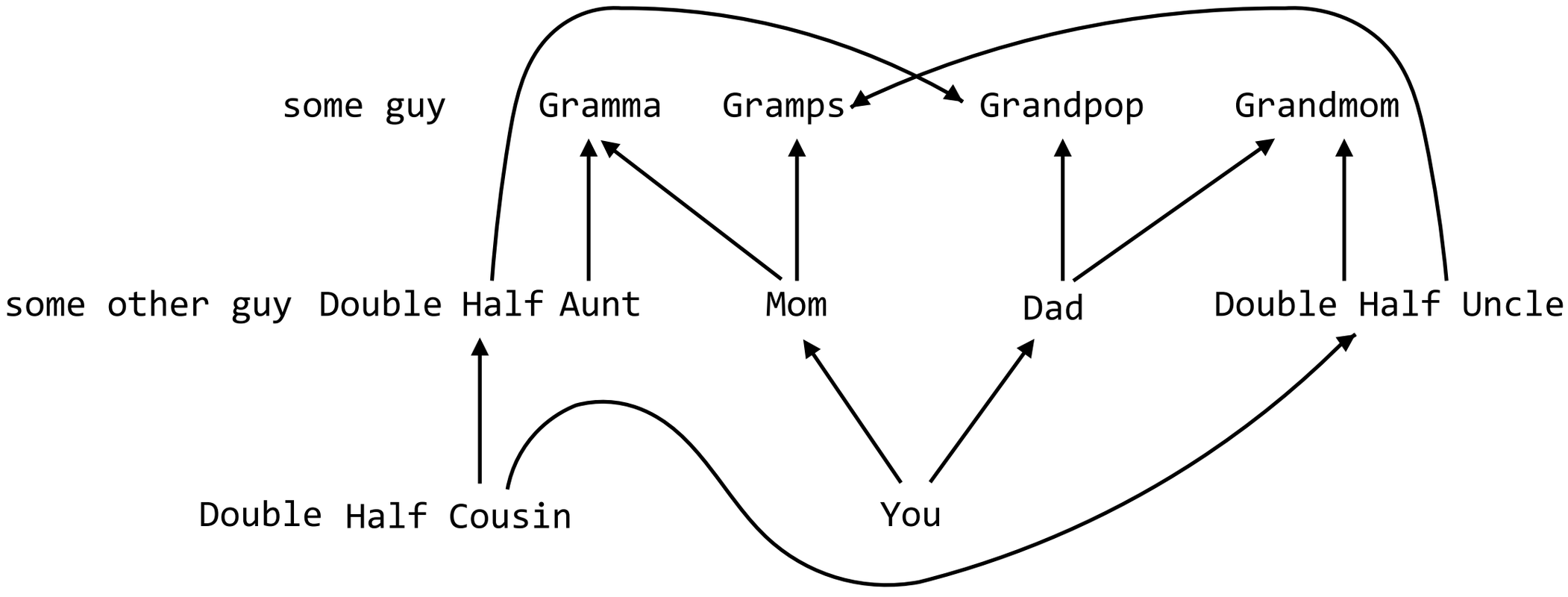

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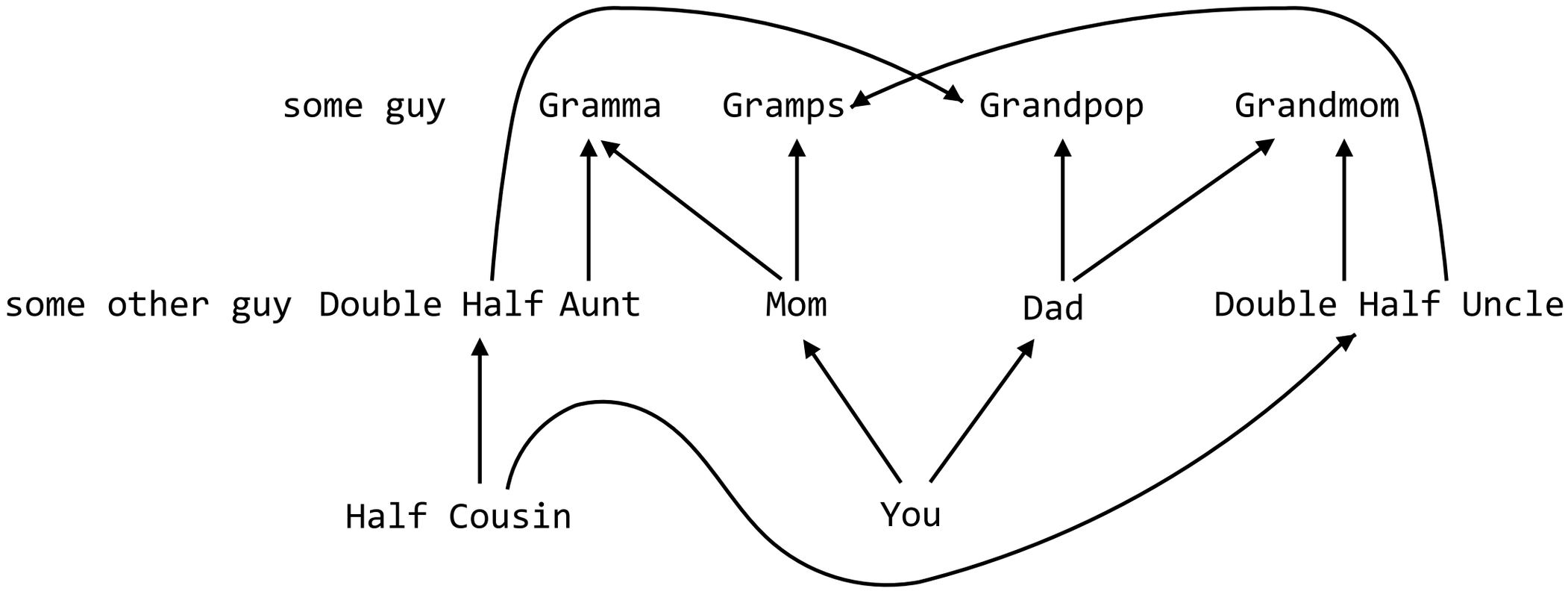

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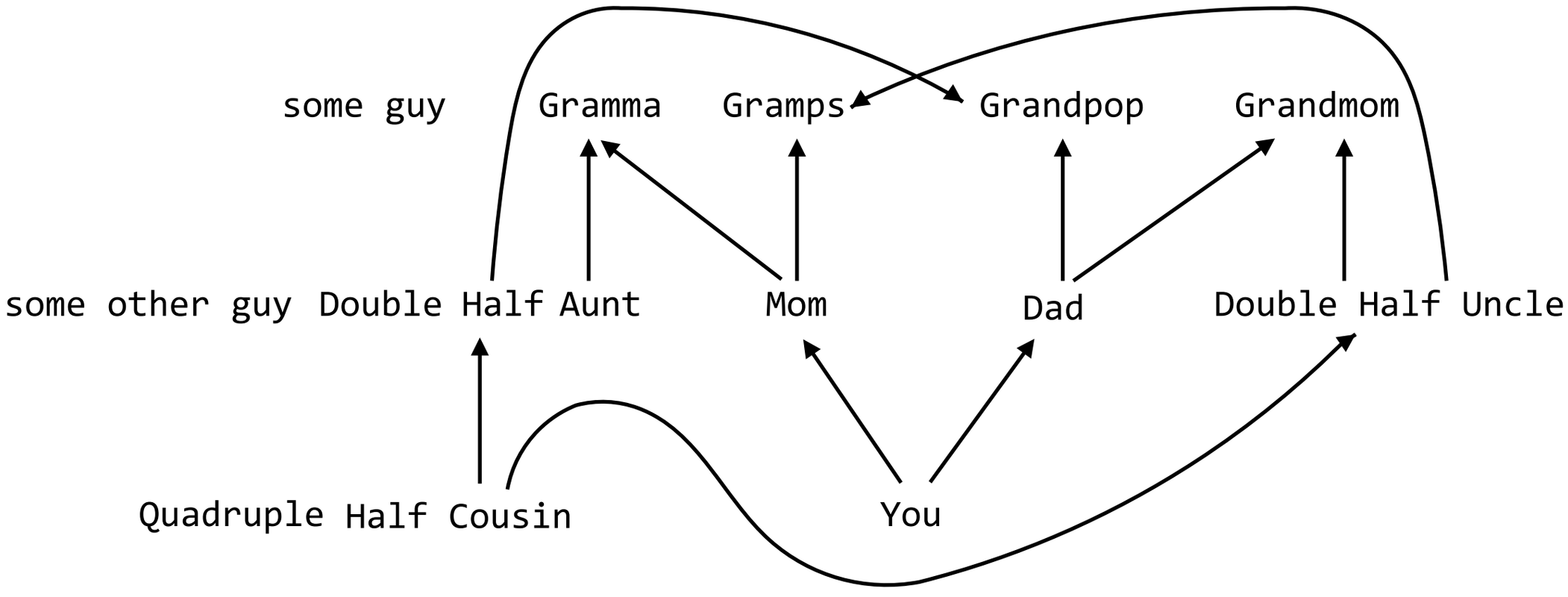

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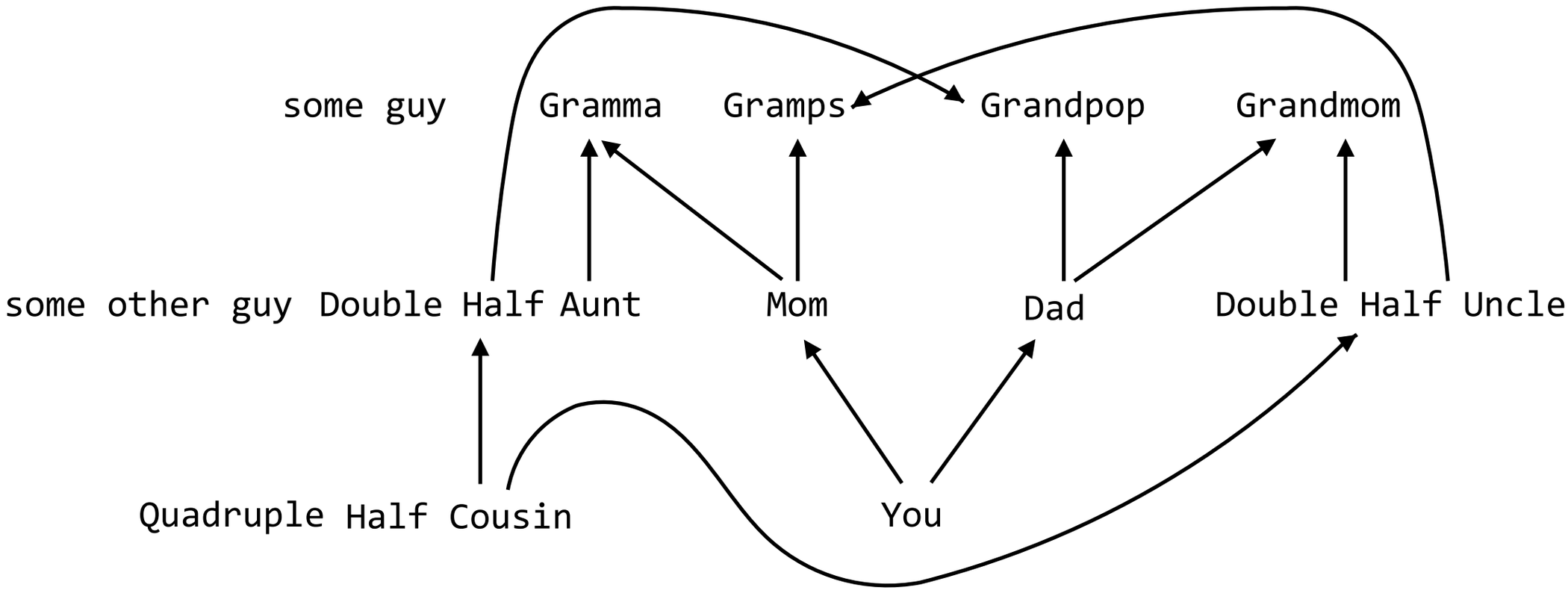

Moral of the story:
Inheritance, especially multiple inheritance,
is complicated and weird. Use it carefully!

Exceptions

Raising and handling exceptions

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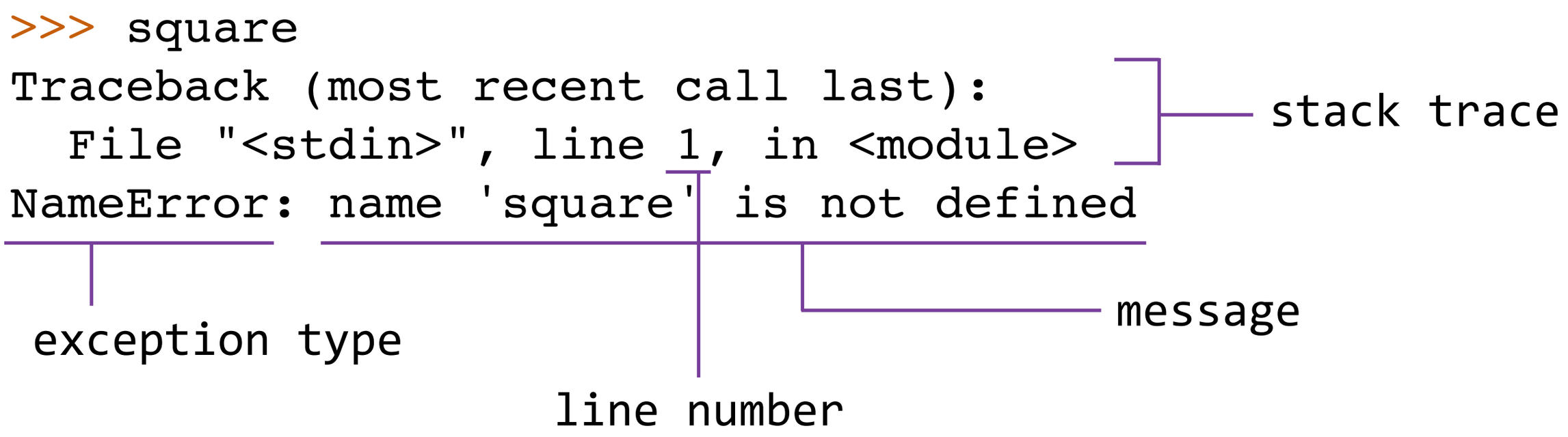

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  - Almost all built-in exceptions inherit from the **Exception** class, which inherits from **BaseException**

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- Both are tools for abstraction, and learning them well is one of the keys to becoming a great object-oriented programmer