CSCI 334:
Principles of Programming Languages

Lecture 20: Object-oriented programming II

Instructor: Dan Barowy

Williams

Topics

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Resume project activity

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Dynamic dispatch

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Resume project activity

Dynamic dispatch

C++ (time permitting)

Activity

Read your partners' project proposal (10 minutes).

Take turns coming up with a program in their language *on paper*.

Partner: does this program make sense? If not, what about your documentation tripped them up?

OO vs Functional Tradeoff

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- FP makes it easy to add operations (rows).
- OOP makes it easy to add data (columns).

Dynamic Dispatch

(the secret to understanding how
Java, Python, Ruby, etc. work)

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- If so, you have an OO system.

Dynamic Dispatch Example

Dynamic Dispatch

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```
c.honk()
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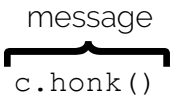

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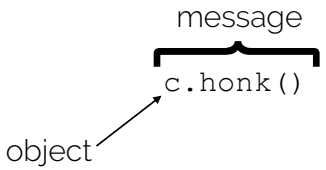

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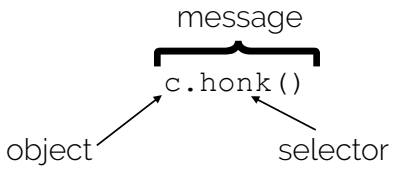

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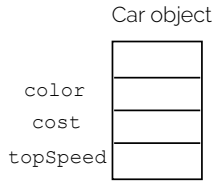

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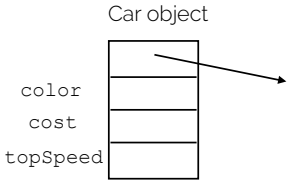

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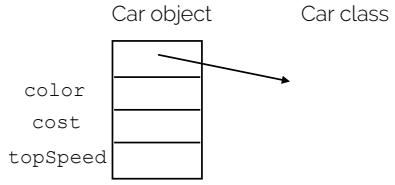

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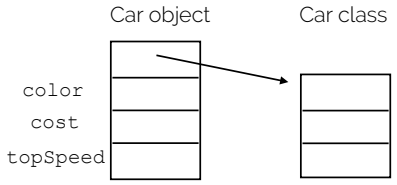

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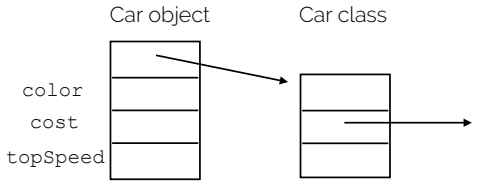

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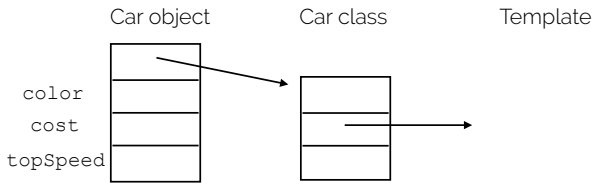

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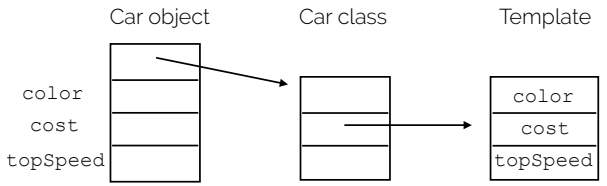

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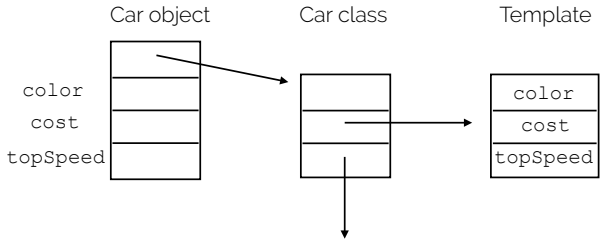

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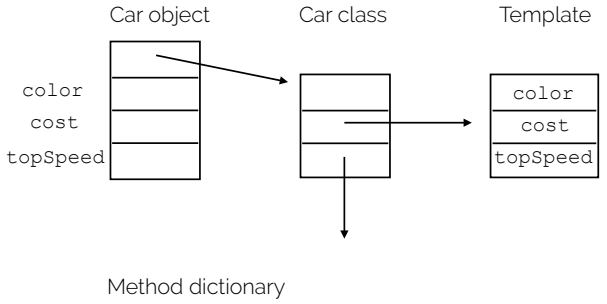

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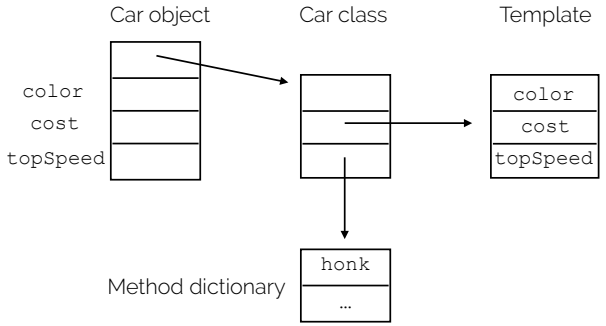

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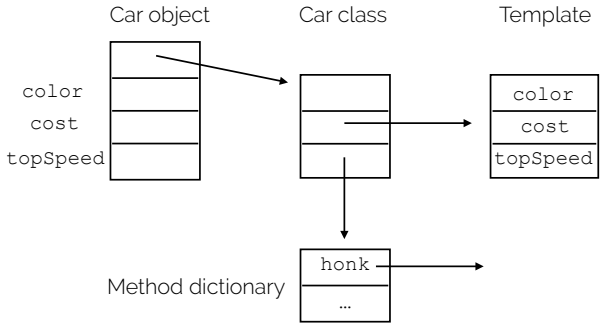

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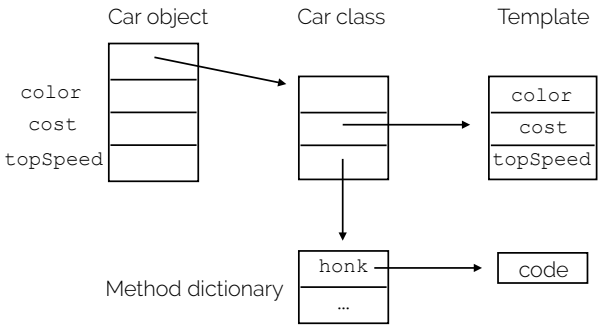

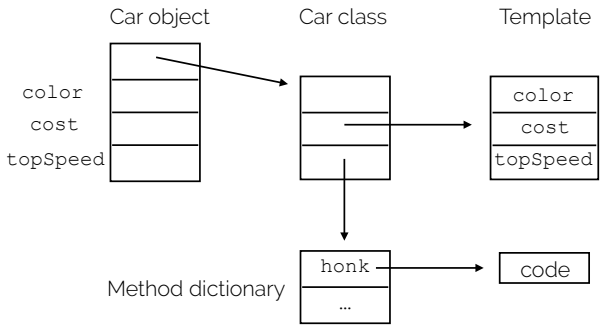

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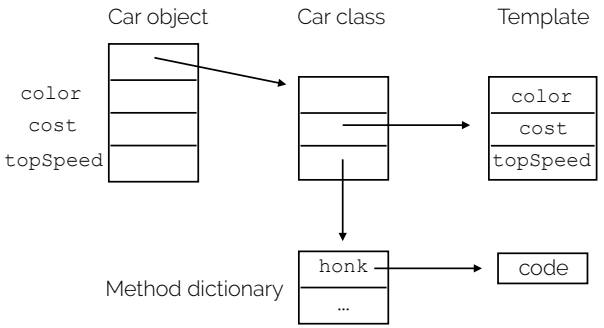

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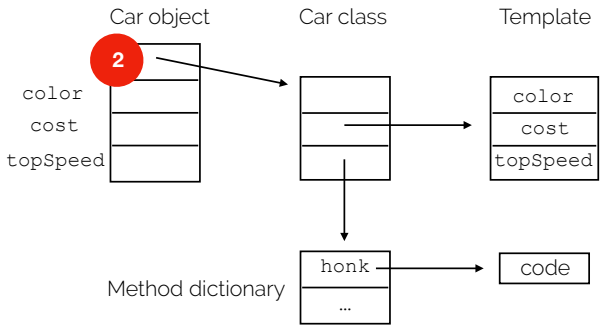

1. Call `c.honk();`
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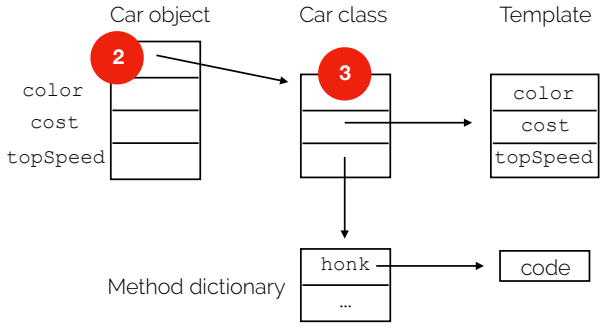

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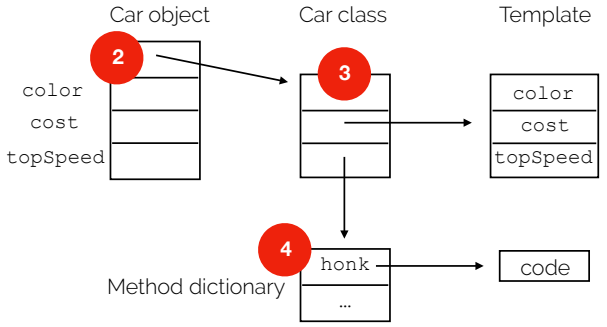

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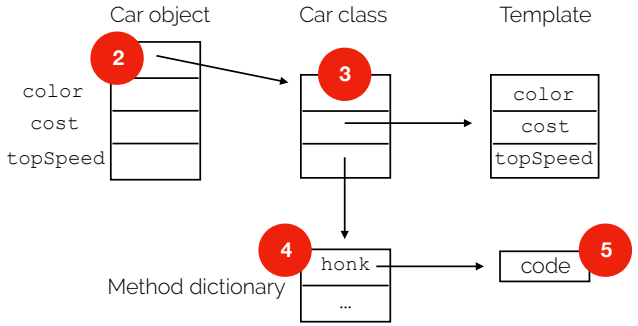

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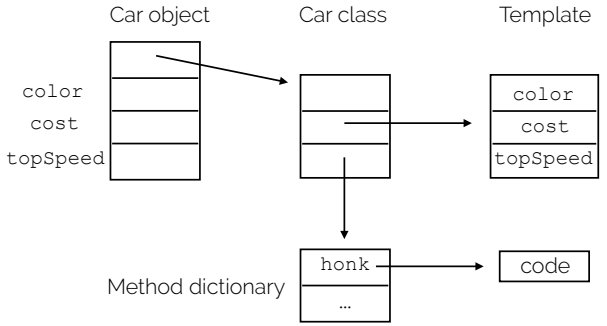

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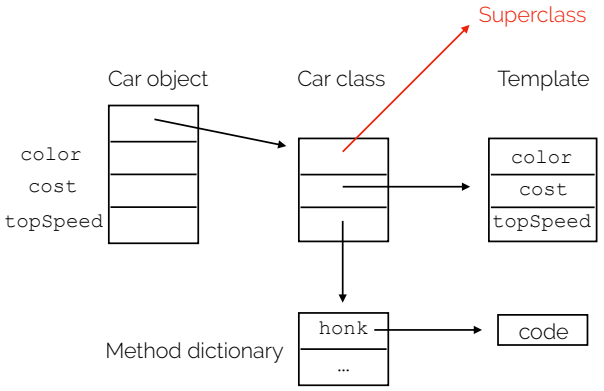

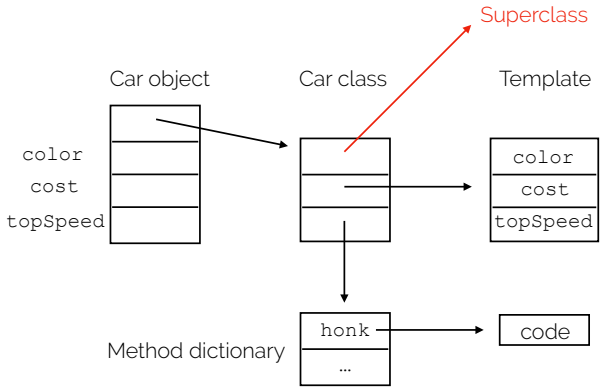

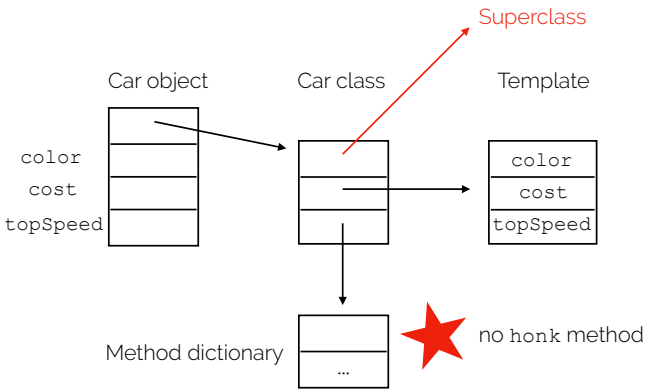

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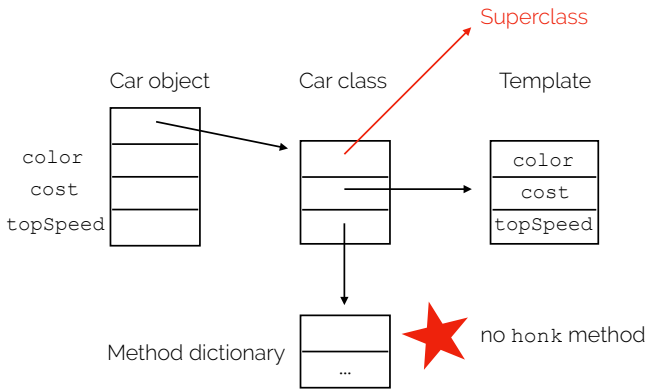

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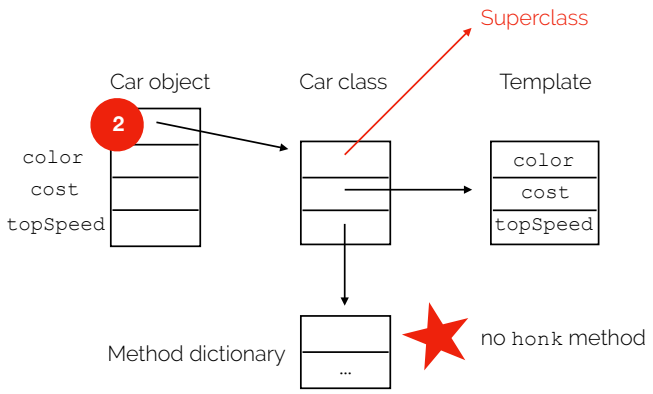

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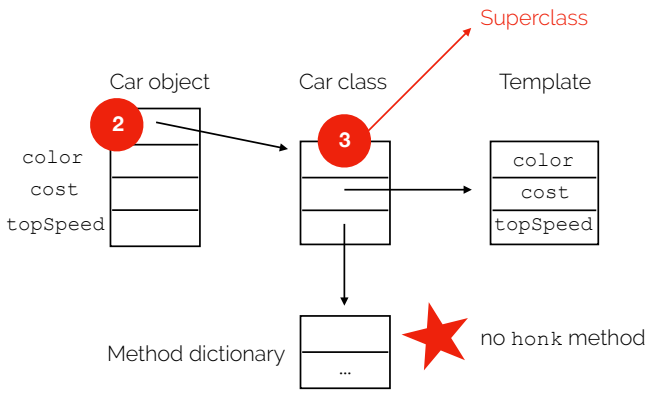

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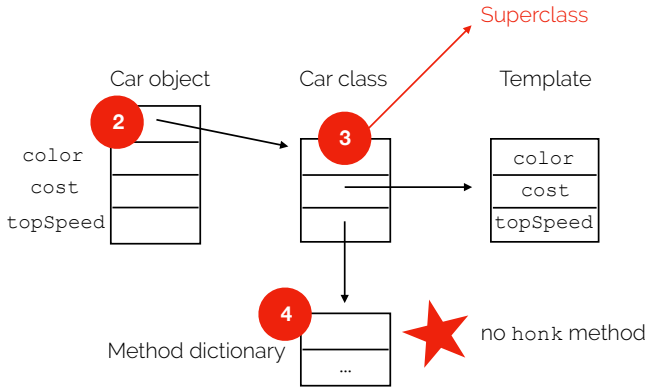

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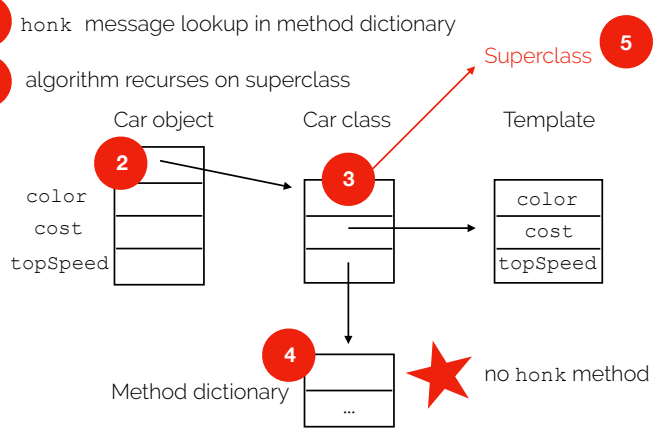
5. algorithm recurses on superclass



Activity

Draw the dynamic dispatch data structures for `Honks`, `Car`, and `Goose`.

C++

Efficient object oriented programming.

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- Major driving philosophy: "only pay for what you use."
- C++ has many features. We will cover only the essential ones here.

C++ example