

# CS301 Software Development

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## CRC Cards in Object-Oriented Design

# CRC Cards

## OO Design is iterative

- Needed: flexible, light weight technology to describe a design

## CRC = Classes, Responsibilities, Collaborators

- Developed by Beck and Cunningham

## Concept

- Use an index card for each class
- Class name on top of card
- Responsibilities on left (or front)
- Collaborators on right (or back)

It is small, rugged, low-tech ...

# CRC Cards

- Responsibilities should be **high level**
- 1 - 3 responsibilities per card
- Collaborators are for the class, not for each responsibility, list them in any order

Mailbox	
<i>manage passcode</i>	MessageQueue
<i>manage greeting</i>	
<i>manage new and saved messages</i>	

## Tips

- Avoid extremes:

### Too much

- Beware the omnipotent system class.
- Avoid mission creep. Do not heap too much on one class.
- Watch out for unrelated responsibilities.
- Do not add functionality that is not required.

### Too little

- A class with no responsibilities is not useful.

- Use CRC to inform, not to design
- Don't have a single monster card
- Omit inessential details

# Walkthroughs

What to do once CRC Cards look fine? Walkthrough Use Cases

Use case: "Leave a message"

- Caller connects to voice mail system
- Caller dials extension number
- "Someone" must locate mailbox

but neither Mailbox nor Message can do this

=> New class: MailSystem

Responsibility: manage mailboxes

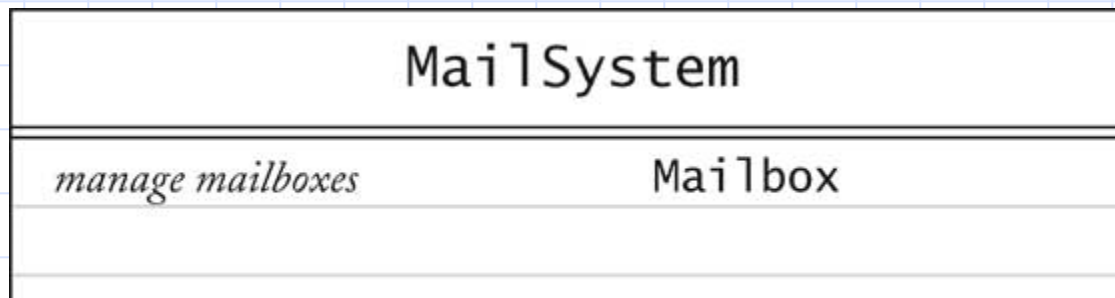


Figure: Cay Horstmann, Object Oriented Design & Patterns, 2nd edition, Wiley

# CRC Cards - Summary

- **Classes - Responsibilities - Collaborators**
  - Identify classes, clarify responsibilities & collaborators
  - Focus on primary objective of system
  - Apply design heuristics & principles
  - Omit inessential details
- **Strength**
  - Index card size appropriate for targeted level of detail
    - Not too many responsibilities, not too many collaborators
  - Good tool for developing designs
    - Supports trial & error, low tech, quick
- **Weaknesses**
  - Not good for documenting / presenting final designs