Object Thinking with CRC cards

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With inspiration from Brett Schuchert's Monopoly Kata

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Classes, Responsibilities, Collaborations

- ▶ Class names
  1. Should not end in -er
  2. Should be names of *things*, not *actions*
  3. Should be related to the *domain* of the problem
- ▶ Responsibilities
  - ▶ For knowing
  - ▶ For doing
  - ▶ For deciding
    An object with less than three responsibilities does too little. An object with more than five responsibilities does too much.
- ▶ Collaborations.
  - ▶ To fulfill its responsibilities, an object must have the necessary information, or have a collaborator that can provide it.
  - ▶ An object should not *know too many other objects*; usually no more than three.

References

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http://c2.com/doc/oopsla89/paper.html, 1989

📄 Peter Coad, Jill Nicola
Object Oriented Programming
Yourdon Press, 1993

📄 Brett Schuchert
Katas.MonopolyTheGame(r)
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📄 Nancy M. Wilkinson
Using CRC Cards: An Informal Approach to Object-Oriented Development
Cambridge University Press, 1998

Scenario 1: *Movement*

- ▶ Given that player A is on "Oriental Avenue"
- ▶ He rolls 2 and 1.
- ▶ He lands on "Connecticut Avenue"

Scenario 2: *Passing through GO!*

- Given that
  - player B's balance is $1000,00
  - she is on "Park Place"
- She rolls 2 and 3.
- She lands on "Mediterranean Avenue".
- Player B collects $200,00 from the bank.
- Her balance is now $1200,00.

Scenario 3: *Go to jail*

- Player C lands on "Go to jail".
- He is moved immediately to "In Jail".
- He does not pass through "GO!"

Scenario 4: *Income Tax when assets are more than $2000,00: pay $200,00*

- Given that player C's balance is $3000,00.
- He lands on "Income Tax".
- He pays $200,00 to the bank. His balance is now $2800,00.

Scenario 5: *Income Tax when assets are less than $2000,00: pay 10% of all assets*

- Given that:
  - Player C's balance is $1000,00
  - Player C owns "Oriental Avenue", which has a purchase price of $100,00.
- Player C lands on "Income Tax".
- He pays $110,00 to the bank. His balance is now $890,00.

Scenario 6: *Players play in sequence*

- Given that:
  - the players in the game are A and B
  - it's A's turn
- Player A rolls and moves
- Player B rolls and moves
- Player A rolls and moves

Scenario 7: *Roll double dice*

- Given that:
  - The players in the game are A and B
  - It's A's turn
  - Player A is on "Go!".
- Player A rolls 3 and 3, he lands on "Reading Railroad"
- Then he rolls again and gets 1 and 2
- He arrives on "Vermont Avenue"
- Now it's B's turn

Scenario 8: *Roll double dice three times*

- Given that:
  - The players in the game are A and B
  - It's player B's turn
  - Player B is on "Go!".
- Player B rolls 1 and 1, she lands on "Community Chest"
- Then she rolls again and gets 2 and 2; she lands on "Oriental Avenue"
- Then she rolls again and gets 3 and 3; she is moved to "In Jail"
- Now it's A's turn

Scenario 9: *Buy property*

- Given that:
  - Player A's balance is $1000,00
  - "Baltic Avenue" has purchase cost $80,00 and is owned by the bank
- Player A lands on "Baltic Avenue".
- Player A is offered the chance to buy Baltic Avenue
- Player A decides to buy Baltic Avenue.
- He pays $80,00 to the bank. His balance is now $920,00.
- He now has the deed for Baltic Avenue

Scenario 10: *Not enough money to buy property*

- Given that:
  - Player A's balance is $10,00
  - "Baltic Avenue" has purchase cost $80,00 and is owned by the bank
- Player A lands on "Baltic Avenue"
- Player A is not offered the chance to buy Baltic Avenue

Scenario 11: *Pay rent on unimproved property*

- Given that:
  - Player A's balance is $1000,00.
  - Player B's balance is $1000,00.
  - Player B owns "Oriental Avenue",
  - "Oriental Avenue" has rent $6,00, has no houses or hotels, is not mortgaged
- Player A lands on "Oriental Avenue"
- Player A pays $6,00 to Player B.
- Player A's balance is now $994,00.
- Player B's balance is now $1006,00.

Scenario 12: *Pay rent on Railroad property (two railroads)*

- Given that:
  - Player A's balance is $1000,00.
  - Player B's balance is $1000,00.
  - Player B owns Reading Railroad and Pennsylvania Railroad; no mortgages.
- Player A lands on "Reading Railroad"
- Player A pays $50,00 to Player B.
- Player A's balance is now $950,00; Player B's balance is now $1050,00.

Scenario 13: *Everyone donates to you*

- Given that:
  - The players in the game are A, B and C
  - Player A, B anc C all have $1000,00 balance
- Player B lands on "Community Chance"
- She picks up the card "Everyone Must Donate 10% of His Holdings to You in Cash"
- Player A's and C's balance is now $900,00
- Player B's balance is $1200,00