DEIF – Card game exercise

The purpose of the test is not only to get a game working which meets the requirements, but to do design a solution which is still valid in the face of changing requirements.

In this test you will design and implement a simple game of cards. Basically, a Player is dealt some Cards from a Deck. When a number of cards have been dealt, the Player with the highest sum of card values is the winner of the game. The details of the games and its constituents are as follows:

Cards:
- A Card can be of suit Red, Blue, Green or Yellow and has a card number between 1 and 8
- The suit corresponds to a multiplier:
  - Red: 1
  - Blue: 2
  - Green: 3
  - Yellow: 4
- The value of a Card is the product of the suit multiplier value and the card number. E.g., a "Green 7" has a value of 3 x 7 = 21, while a "Blue 4" has a value of 2 x 4 = 8.

Player:
- A Player has a name and can hold any number of cards.
- A Player can be dealt a Card, and can be asked for the total value of his hand.
- A Player can be asked to "show his hand", i.e. output the cards (suit and card number) of every card in his hand.

Deck:
- A Deck holds a number of cards,
- A Deck can be asked to deal a number of cards to a given player

Game:
The game controls the card game, i.e.
- Accepts new players in the game before it is started
- Commands the dealing of cards
- Can be asked to announce the winner of a game.

When the winner is announced, the game is over, and a new game can begin.

Exercise 1:
Draw a domain model of the card game. As you do, look at the details above and ask yourself:
- What is the state ("knowledge") of each domain class?
- What is the behavior ("responsibility") of each domain class?
- What other classes do the individual domain classes relate to?

Exercise 2:
Create a design of the system. In doing so, be sure to think about how to encapsulate the "knowledge" of each class and how to expose the necessary behavior of each class.

Exercise 3:
Implement your game and test it: Add 3 players, deal each player 5 cards, have them show their hands and then have the winner announced. Compare the shown hands to the announced winner - is the result correct?