Assignment 2: Object Methods

CS230
Fall 2000

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Due: Wednesday 27 September

The purpose of this assignment is to review the syntax for object methods and to design and implement a few simple algorithms (for identifying poker hands).

1 Object methods

Chapter 6 of the book explains the syntax for object methods and makes some suggestions about when you might choose one syntax over the other.

1. Go back over the Deck assignment from last week and consider which methods would be better as object methods. Go ahead and transform them and then test the program to make sure it still works.

2. Compare the number of lines and number of words in the program before and after this transformation. Which program is more concise? Which program seems easier to read to you? Which program seems like a more natural way to express the computation? Please write a paragraph or two to answer these questions.

2 Classification

The following are the possible hands in poker in increasing order of rank (and decreasing order of probability):

pair: two cards with the same rank

two pair: two pairs of cards with the same rank

three of a kind: three cards with the same rank

straight: five cards with ranks in sequence

flush: five cards with the same suit

full house: three cards with one rank, two cards with another

four of a kind: four cards with the same rank

straight flush: five cards in sequence and with the same suit

Chapter 3 of the book explains the notion of a histogram. You might want to review that material before continuing.

1. Write methods named `isPair`, `isTwoPair`, etc. that take a `Deck` as an argument and that return a boolean indicating whether or not the hand meets the relevant criteria. Your code should work correctly for "hands" that contain any number of cards (although 5 and 7 are by far the most common sizes).

   Something to think about is whether a hand that contains three of a kind should be considered to contain a pair as well.

2. Write a loop that shuffles a deck of cards, divides it into hands, classifies the hands, and counts the number of times various classifications appear.

3. Print a table of the classifications and their probabilities. Run your program with larger and larger numbers of hands until the output values converge to a reasonable degree of accuracy. You might want to express the results in a form like "A straight flush occurs 1 time out of 123456789 hands."

3 What to turn in

1. Prepare your code according to the instructions on the first assignment.

2. For the first part of this assignment, you should go through and highlight just the changes you made.

3. Please print a copy of the complete program, and also a copy of the probability table from the second part. Write your name in the upper-right corner of the first page and staple everything.