

# Homework 3: Object Methods

cs230  
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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 13 of the book explains the syntax for object methods and makes some suggestions about when you might choose one syntax over the other.

1. If there was any part of your Homework 2 that was incomplete or incorrect, go over it and fix it (possibly using the solutions I hand out).
2. Look over the methods in the Card and Deck classes and consider which would be better as object methods. Transform them and then test the program to make sure it still works.
3. Write methods called `equals`, `clone`, `compareTo` and `toString`. \*\*\*\*\*
4. 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, in comments at the end of the code, 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 10 explains the notion of a histogram. You might want to review that material before continuing.

1. Write object methods named `isPair`, `isTwoPair`, etc. that can be invoked on a `Deck` object 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 (5 and 7 are 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. You should remove unnecessary print statements you included for debugging, but please include the code you used for testing.