```
/*************************************************
 * analyze_hand: Determines whether the hand contains a   *
 *               straight, a flush, four-of-a-kind,       *
 *               and/or three-of-a-kind; determines the   *
 *               number of pairs; stores the results into *
 *               external variables.                      *
 *************************************************/
void analyze_hand(void)
{
  ...
}

/*************************************************
 * print_result: Notifies the user of the result, using   *
 *               the external variables set by            *
 *               analyze_hand.                            *
 *************************************************/
void print_result(void)
{
  ...
}
```

The most pressing question that remains is how to represent the hand of cards. Let's see what operations `read_cards` and `analyze_hand` will perform on the hand. During the analysis of the hand, `analyze_hand` will need to know how many cards are in each rank and each suit. This suggests that we use two arrays, `num_in_rank` and `num_in_suit`. The value of `num_in_rank[r]` will be the number of cards with rank `r`, and the value of `num_in_suit[s]` will be the number of cards with suit `s`. (We'll encode ranks as numbers between 0 and 12, and suits as numbers between 0 and 3.) We'll also need a third array, `card_exists`, so that `read_cards` can detect duplicate cards. Each time `read_cards` reads a card with rank `r` and suit `s`, it checks whether the value of `card_exists[r][s]` is `true`. If so, the card was previously entered; if not, `read_cards` assigns `true` to `card_exists[r][s]`.

Both the `read_cards` function and the `analyze_hand` function will need access to the `num_in_rank` and `num_in_suit` arrays, so I'll make them external variables. The `card_exists` array is used only by `read_cards`, so it can be local to that function. As a rule, variables should be made external only if necessary.

Having decided on the major data structures, we can now finish the program:

poker.c

```
/* Classifies a poker hand */

#include <stdbool.h>   /* C99 only */
#include <stdio.h>
#include <stdlib.h>

#define NUM_RANKS 13
#define NUM_SUITS 4
#define NUM_CARDS 5
```