

Spider, Double Deck Solitaire
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INTRODUCTION

SPIDER is a particularly challenging double-deck solitaire. Unlike most solitaires, it provides extraordinary opportunities for the skillful player to overcome bad luck in the deal by means of careful analysis and complex manipulations. The SPIDER program does not actually play the game for you, but rather takes the place of the cards (by displaying the tableau on the screen) and keeping a record of the game so that you can follow out long lines of play without losing track of where you started from. Note the suggest minimum video resolution is 800x600. The game is playable at lower resolutions however the cards will not be as clear do to the lower resolution.

INSTALLATION

There are no special requirements for installing Spider. If you already know how to install a Windows application, then place the executable file wherever you like. Otherwise, copy the program file into your Windows directory and run Windows. Follow these steps:

1. In the Program Manager, open your Games icon (if it is not already open).
2. Select the File menu in the menu bar of the Program Manager and make the New... selection
3. When the dialog box opens, press the OK button.
4. In the file selector, scroll down to the bottom of the list. Double click on SPIDER.EXE, which will be one of the first files shown.
5. In the next dialog that appears, press Change Icon. If the icon shown is not acceptable, press the View Next button until a more appropriate icon is displayed. There are three icons total. When you are ready, press OK and OK again.

The SPIDER.EXE icon should now appear in your Games group. The program can be run by double clicking on the new icon.

RULES FOR SPIDER

The object of the game is to build a stack of cards in the same suit from King to Ace and remove the stack from the table to the stacks above. When all eight stacks have been built and removed, you have won the game. A more challenging version of this is to leave some or all of the eight stacks on the table until done instead of removing those that are complete to the stacks above.

One may move the next lower card onto a card of the same or different suit; however, one may only move contiguous cards of the same suit as a group. For example, one may move the 5 of spades into either a 6 of spades or a 6 of hearts. Moving the 5 of spades onto the 6 spades is a better move since now the 5-6 of spades group may be moved as a unit where the 5 of spades, 6 of hearts group may not. Also, moving the 4 of spades onto the 6 of spades is not a legal move. A King may only be moved into a space (or removed to the stacks above when the sequence K-Ace is complete) since there are no higher cards than a King.

For general strategy, one wants to try to create a "space" since this is the most

flexible way to move cards around. A space is where all cards in the table have been removed. Note: before dealing the next round, all spaces have to have at least one card in them.

When moving the cards, it is generally to your advantage to move the highest cards first and the lowest cards last doing the obvious moves first. For example, move a 5 of spades onto a 6 of spades, then Queen of hearts onto a King clubs before you move the 7 of clubs onto the 8 of hearts. Then you may choose to move 5-6 of spades group onto the 7 of clubs. The strategy is to combine the cards into same suit groups that may be moved as a unit. Once the group 5-6 of spades has been created, it may be broken up by placing the mouse on the 5 of spades and while holding the left mouse button down drag the card to the desired stack.

THE INITIAL TABLEAU. Shuffle together two decks of cards (104 cards in all) and deal ten cards face down in a row. Deal three more rows face down on the first. Next deal one card face down on each of four piles (traditionally the leftmost four, but it doesn't matter; for aesthetic reasons some people prefer the first, fourth, seventh, and tenth piles), for a total of 44 face-down cards. Finally, deal one card face up on each pile. These 54 cards constitute the initial tableau. NOTE: In the description below, the card at the "bottom" of a pile is taken to be the last one dealt or played onto that pile, as opposed to the card that is underneath all the others in the pile. Thus the "bottom" card is the one displayed bottommost on the screen by the Spider program.

BUILDING. All building is done in the tableau, there being no separate foundations. On the bottom card of a pile may be placed any card of next-lower rank, regardless of suit. (Cards rank King (highest), Queen, Jack, 10, 9, . . . , 3, 2, Ace.) The bottom card of a pile is always available to be moved, as is any sequence of cards at the bottom of a pile that are consecutive and ascending in rank and of the same suit.

For example, suppose the 6, 5, and 4 of hearts are together at the bottom of a pile, with the 4 bottommost. They may be moved as a unit, or the 4 can be moved by itself, or the 5 and 4 can be moved without moving the 6. If the 6, 5, and 4 were moved onto a 7 of hearts at the bottom of some other pile, the four cards could then be moved as a unit onto any 8; if the 7 were not a heart, however, then once the hearts were placed upon it would not be available to be moved until the hearts had been moved from it (to another 7 or into a space; see below). When all face-up cards have been removed from a pile, the bottom face-down card is turned up and becomes available for play.

SPACES. When all cards have been moved away from some pile, the resulting empty pile is called a "space" or "hole". Any card or sequence of cards available for moving may be moved into a space. A King, or sequence headed by a King, can be moved ONLY into a space, and once moved there can never be moved out (except into another space, which doesn't accomplish anything) unless it is being removed entirely as described below.

THE HAND. The 50 cards not dealt initially form the "hand". Whenever you wish (typically, whenever you get stuck), you may deal a new row of ten cards from the hand face-up upon the piles. NOTE: You are not allowed to do this if you have any spaces. You must first fill them in. Notice that these additional deals tend to introduce discontinuities in the piles; that is, you can get cards covering others that are not next-higher in rank. If you get stuck after having dealt the last of the five

additional deals, you have lost.

OBJECT OF PLAY. When you have assembled a complete suit of thirteen cards, in sequence from King down to Ace, at the bottom of a pile, you may remove the thirteen cards from the tableau entirely. Cards so removed are never brought back into play; thus it is not always desirable to remove a suit when you have the opportunity (though it usually is), since it may pay to keep it around to aid in manipulating the other cards of that suit (recall that there are 26 cards in each suit). The game is won if you manage to remove all eight suits.

If you find that a game is going so well that you're sure you're going to win, you can spice things up by trying to finish with as many completed suits as possible still in the tableau. Hardest of all is to finish the game with each of the eight suits brought together in sequence from King down to Ace, with all of the cards still in the tableau. Note that, once you start striving toward such a goal, you may make such a mess of the position that you won't be able to win at all!

SCORING. Spider is a difficult game to master, and some players like to be able to evaluate their progress by scoring unsuccessful games. No rules for scoring are in the literature, but the program implements the following rather arbitrary formula: 10 points for each initially face down card that gets turned over; 15 additional points for each column where all the face down cards have been turned over (even if you don't manage to get a space); 2 points for each card that is sitting atop the next higher card of the same suit; 50 points for each completed suit removed from the tableau (in which case you do not also score for the 12 cards sitting atop next higher cards). This yields a maximum score of 990. If you win the game with 4 or more completed suits still in the tableau, add 2 points for each suit after the first three. Thus winning with all eight suits still in the tableau yields a score of 1000.

THE SPIDER PROGRAM

The stack of cards in the upper left of the Spider window represents the undealt cards . The eight outlines to the right mark where the eight suits will go as you remove them from the tableau.

To start a new game, select the [New Game] menu selection. Playing the game is handled entirely within the main window.

If you click the left button over the last card in a single column, the program tries to move the specified cards to "the obvious place" by trying the following choices, in order: (1) remove them if they form a completed suit, else (2) move them onto a card of the same suit, else (3) move them onto a card of a different suit, else (4) move them into a space. If it can't do any of these, it complains. If the mouse is over a card that is moveable it says you want to move the card you're pointing at plus any cards covering it. If these cards cannot be moved as a unit (i.e., they are not a sequence within a suit), the program says so. Again, if you move the mouse to another column and release the button, the program moves as the selected cards to the destination. The only time you need to use this method (instead of using first method) is if you're moving cards AND you wish to move fewer than the maximum permitted or to a specific column.

If you instead use the right mouse button to select within a column, the column is expanded showing only the faceup cards. This is helpful when the number of cards

in column force the spacing to be small.

You can also remove a completed run(all 13 cards) to the tableau suit by selecting the column and click the left mouse button .

To deal a new round, click any button on the facedown stack in the upper left. The window's caption shows you how many more deals have been made. Remember that all spaces must be filled before you can deal a new round.

If you click with the right mouse button in the outline region where the removed suits go, the program will tell you which suits (if any) have enough cards face-up to form a complete sequence of thirteen.

The game also has a menu panel for performing some less frequent operations.

[File: Save in File], which writes a file containing the current state of the game, including the original deck and all the moves made so far. The name of the file is taken from the dialog box. The file also includes a human-readable text representation of the current tableau.

[File: Resume from File] reads a file created by the [File: Save in File] command. The name of the file is taken from the dialog box. Note, reading a file takes considerably longer than writing!

[New Game]: Throws away the current game and start a new one.

[Backup: One Move]: Undo the last move.

[Backup: Start Over]: Play the same hand again. This will restart the game with the initial deck, discarding what you've already done.

[Score]: Shows the current score.

[Help]: Gives a move suggestion. This isn't necessarily the best move, but may be helpful for beginners or confirming that there are no more moves.

EXAMPLES AND CONUNDRUMS

In all the examples below, the tableau will be given here in the text as best as can be done within the limits of the character set. Some of these examples are extremely complex. Novice players may wish to step through just the first example, to get an idea of how to play, and save the other examples for later. The final example is a deck that is especially easy to win with (unless you're trying to win with all eight suits still in the tableau), so you might try that one to boost your confidence if you're having a lot of trouble getting anywhere.

Here, to start you off, is an example of the beginning of a game. We'll step through it and look at the rationale behind the recommended moves. Here's the initial tableau:

```
--      --      --      --      --      --      --      --      --      --  
--      --      --      --      --      --      --      --      --      --
```

| | | | | | | | | | |
|----|-----|----|----|----|----|----|----|----|----|
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| -- | 10d | As | -- | 3h | 9s | -- | Jh | Qh | -- |
| 6d | | | 4s | | | 3c | | | 7c |

The two primary rules of thumb to bear in mind throughout the game, and particularly at the start, are (1) try to get a space, and (2) keep your options open. The first rule should be fairly clear; the second leads to a few common strategic decisions. First, given the choice, make a "natural" move instead of an "unnatural" one, where a natural move is one that brings together two cards of the same suit. This keeps our options open by allowing us to move the newly combined cards as a unit should we turn up an appropriate card. Second, given the choice, move a card (or pile) that has more than one place it can go. This keeps our options open by allowing us to move it to the other place if for some reason we want to dig into the pile sitting in the first location. Third, work from the top down. Thus we move a 9 onto a 10 before moving an 8 onto the 9 (unless the latter move is natural while the former is not), since once we move an unnatural 8 onto the 9 we won't be able to move the 9. Now, with these ideas in mind, let's look at the play of the above tableau.

Our highest-ranking move is Jack onto Queen, and it's also our only natural move, so it wins for sure. We move the Jh from column 8 to column 9, and in this particular game we chance to turn up a 6s in column 8. Now we have no natural moves. We could try for the space by moving the 6s to column 10, but that move isn't going to go away, so instead we go from the top down by moving the 10d from 2 to 9. This time we turn up a 4c. No hesitation about this one! We move the 3c from 7 to 2. (Note that we still have the 4s onto which we can, eventually, move the 3h, so we're not giving up our option of digging into pile 5. But even if we didn't have the other 4, making the natural move would be the better play.) In column 7 the card turned up is a 2c, which we promptly move to column 2, turning up a 10h. The tableau is now:

```

--      --      --      --      --      --      --      --      --      --
--      --      --      --      --      --      --      --      --      --
--      --      --      --      --      --      --      --      --      --
--      4c      --      --      --      --      10h      6s      --      --
--      3c      As      --      3h      9s      --      --      Qh      --
6d      2c      --      4s      --      --      --      --      Jh      7c
--      --      --      --      --      --      --      --      --      10d

```

Having once again run out of natural moves, we revert to working from the top down, and move the 9s from 6 to 9. This also follows the rule of moving a pile that has more than one place to go; if we find ourselves interested in digging through column 9 we can move the 9s to column 7 instead. But for now, since column 7 looks like a more likely place to dig, we'll bury column 9 a bit more. In column 6 we turn up a Kc. Since we have no place to move the 10d from column 9, we are unable to get pile 9 moved onto the newly revealed King. Them's the breaks.

Continuing from the top down, we decide it's time to move a 6 onto the 7c. Which 6 should we move? Neither is natural, but the one in column 8 looks like a better one to move since we're only 3 cards away from getting a space in that column. So we move the 6s from 8 to 10 and turn up a 6c. We're getting low on things to do now; we can move the 3h or the As. Going by the top-down rule, we move the 3h from 5 to 4, turning up a 2h, which we move onto the 3h (now in column 4). This time we turn up a 9d:

```

--      --      --      --      --      --      --      --      --      --
--      --      --      --      --      --      --      --      --      --
--      --      --      --      9d      --      --      6c      --      --
--      4c      --      --      --      Kc      10h      --      --      --
--      3c      As      --      --      --      --      --      Qh      --
6d      2c      --      4s      --      --      --      --      Jh      7c
--      --      --      3h      --      --      --      --      10d      6s
--      --      --      2h      --      --      --      --      9s

```

We could now move the 9d from 5 to 7, but instead we choose to move the As from column 3, since there are two places to put it. Column 4 is already unnatural, so we'll move it there. The card turned up is the other As. We could move this Ace onto the other deuce, but this would lose us our option of moving the first Ace there should we want to dig into column 4, so we'll let the top-down rule take precedence and move the 9d. But let's not be hasty! Instead of moving the 9d from 5 to 7, we'll move the 9s from 9 to 7 and then move the 9d from 5 to 9; this puts the 9d with a 10d, which it can't hurt to do. This time we turn up a Qh. Since we're so close to a space now, we keep going by moving the Qh from 5 to 6, turning up a 10d:

```

--      --      --      --      10d      --      --      --      --      --
--      --      --      --      --      --      --      --      --      --
--      --      --      --      --      --      --      6c      --      --
--      4c      As      --      --      Kc      10h      --      --      --
--      3c      --      --      --      Qh      9s      --      Qh      --
6d      2c      --      4s      --      --      --      --      Jh      7c
--      --      --      3h      --      --      --      --      10d      6s
--      --      --      2h      --      --      --      --      9d
--      --      --      As      --      --      --      --      --

```

Only one move left to try: we move the As from 3 to 2, turning up a 7h. Once again, we shuffle things around a bit so keep as many piles natural as possible; we move the 6s from 10 to 3 and the 6c from 8 to 10, turning up a 5d. We move the 5d from 8 to 1 (natural) and turn up a 3s:

```

--      --      --      --      10d      --      --      3s      --      --
--      --      --      --      --      --      --      --      --
--      --      7h      --      --      --      --      --      --
--      4c      6s      --      --      Kc      10h      --      --
--      3c      --      --      --      Qh      9s      --      Qh      --
6d      2c      --      4s      --      --      --      Jh      7c
5d      As      --      3h      --      --      --      10d      6c
--      --      --      2h      --      --      --      9d
--      --      --      As

```

We have no more moves (aside from useless maneuvers such as moving the 9d from 9 to 5), so it's now time to deal a new round. We never did get a space, but we got two piles down to a single card each, so we are quite likely to get a space soon after the new deal. This game is going somewhat better than average and will very likely be won with proper play. If you actually do get a space in the first round, you're doing particularly well.

Now, for your first "Spider problem", here is a relatively simple position. In the tableau shown below, what should you do? First off, what are your options? On what should you base your choice? (After the tableau is the "solution", so don't read further until you're ready!)

```

10h  (sp)  --      Ad      --      Qc      --      3s      Qh      --
--      7d      --      Jh      --      2s      --      --
--      6d      Kh      10d      --      --      --      --
8s      5d      Qc      6c      --      --      --      7d
7s      Qs      Jc      4c      Qd      --      --      6d
6s      Js      10c      3d      Jd      --      --      5d
--      10d      9c      2d      10h      --      --      4d
--      --      8c      --      Js      --      --      3d
--      --      7c      --      10s      --      --      2c
--      --      6c      --      9s      --      --      As
--      --      5c      --      8h      --      --      --
--      --      4c      --      7h      --      --      --
--      --      3c      --      6h      --      --      --
--      --      2c      --      5h      --      --      --
--      --      Ac      --      4s      --      --      --
--      --      Qd      --      3h      --      --      --
--      --      10c      --      10s      --      --      --
--      --      9c      --      8c      --      --      --
--      --      8s      --      7h      --      --      --
--      --      7s      --      6h      --      --      --
--      --      6s      --      5h      --      --      --
--      --      5s      --      4h      --      --      --
--      --      4s      --      3h      --      --      --
--      --      3s      --      2h      --      --      --
--      --      2s      --      Ah      --      --      --

```

Solution:
8

First, the options. There's no way to get through column 5 or 7 to turn up a new card. (This should be pretty obvious; we'll save detailed analyses of this sort of thing for cases where it's not as clear.) Nor does it do us any good to dig into column 4 or 6. We don't have any complete suits showing, so there's no way we can try to put one together. That leaves three fairly simple options: (1) we could move the 8-6s from column 3 into the space, turning up a new card, (2) we could dig through column 10 (moving the Ace onto a deuce, the 2c into the space, 5-3d onto the 6s in column 3, 2c out of the space and back onto the 5-3d, and finally the 7-6d into the space) and turn up a new card there, or (3) we could fill in the space and deal a new round.

It's usually a good idea to turn up more cards when possible rather than bury everything under a new deal, so we'll discount the third option. That leaves us with the choice of which column to dig through, 3 or 10. The two are equally close to becoming new spaces (three face-down cards each), so that's not a consideration here. Let's consider what the face-down card might be that will be revealed. If it's a Jack, 4, or King, we can get back the space (which we'll have lost in the process of getting to the new card). If it's a 9 or 8, we MIGHT get the space back right away; it depends on whether we moved the 8 (from column 3) or the 7 (from column 10) into the space. Looking at the tableau, we see there are five 8's visible, but only three 9's. Thus it's more likely we'll turn up a 9, so we should go for column 3. (Sorry for all this gory detail, but this is after all intended as an introductory example.)

So it looks like the best thing to do is move the 8-6s from column 3 into the space. But wait! Suppose the card turned up isn't a Jack, 4, King, or 9, and furthermore isn't an Ace or 5 (which we would be able to move elsewhere immediately)? Is there anything we can do ahead of time to hedge our bets? Yes! We can move the spade Ace from column 10 to column 5, then use the space to swap the deuces in columns 6 and 10 (move one deuce into the space, move the other deuce to the other column, and move the first deuce out of the space). Now column 10 contains just the 7 through deuce of diamonds, and if we chance to turn up an 8 in column 3 we can move the 7-2d onto it. Note that we have to do this BEFORE we move the 8-6s into the space, since we need the space to swap the deuces. In fact, in the game where this particular tableau arose, the card turned up in column 3 was the diamond 8. The preparations made in column 10 eventually produced not one but TWO spaces!

Turn up another face-down card WITHOUT dealing more cards or "using up" the space. (You may, of course, use the space, so long as you are sure you can get it back no matter what the card turned up turns out to be.) Note that there are enough clubs and hearts showing to form complete sets of those suits. Here's the tableau (again, the solution follows the tableau):

| | | | | | | | | | |
|-----|----|------|----|----|----|----|----|----|----|
| -- | -- | (sp) | -- | Qh | -- | -- | -- | -- | -- |
| -- | -- | | Ks | Jh | -- | Jc | -- | -- | -- |
| -- | -- | | 2s | 7h | -- | 8h | -- | -- | Kh |
| -- | -- | | As | | As | 7h | Kc | -- | Qc |
| Jc | Kd | | 9h | | 9h | | Qc | Kc | Jh |
| 10h | 9d | | 8d | | 8s | | Jd | 7s | Js |
| 9c | 8d | | | | 7c | | 5s | 6s | 3d |
| 8s | 7d | | | | 6c | | 4h | Qh | 2c |

7d
6h
5d
3d
2d
Ah
9s
10c

3h
2h
Ah
2d

5c
4h
3s
2s
5c
6d
5h

3c
2c
Ac
10s
9s
8c
7s
6s
5s
4c

Js
8c

Ad
8h

Solution:

First, we ascertain that we can't get a second space. The only place where we might be able to do so is column 5, and to move the Q-Jh we need to find a King that doesn't already have a Queen on it. (We'll call this a "free King", for short.) There are three free Kings, but the one in column 9 is useless since we need another free King to get to it, and those in columns 2 and 4 are inaccessible since there are no free 3's. Hence, whatever we do, we have to do it using only the one space.

Next, can we remove a complete set of clubs or hearts? Well, hearts are out, because the only Kh showing is in column 10, and the only 10h is in column 1, and getting to each of them requires that we move a 3 onto a free 4. Since there's only one free 4 (in column 8), we lose. How about clubs? They don't work out, either, but the proof is trickier. The only 9c is in column 1 and getting to it will require our sole free 4. Thus we can't use the Qc in column 10, and must instead use the Qc from column 8. To reach it we need a free 6; we have exactly one free 6, namely in column 9. We CAN get to this 6, without losing the space, by a fairly convoluted sequence of moves. You may want to figure out how it can be done before reading on. . . . Ready? Okay, proceed as follows: 7h from 5 to 10, 10c from 1 to 5, 8c from 9 to 1, Js from 9 to 3 (into the space), 10c from 5 to 3, Jh from 5 to 9, 10c from 3 to 9, Js from 3 to 5, 10c from 9 to 5, Q-Jh from 9 to 3, 7-6s from 9 to 4, and finally Q-Jh from 3 to 9, getting the space back.

Having determined that we can, if desired, obtain a free 6, let's get back to the question of the clubs. The only 7c is in column 6, and getting to it requires a free 6. But we need the free 6 to get to the Qc as well. So we again lose. We are thus reduced to uncovering a card without removing any suits and without getting any more spaces. Which column is it to be? It obviously can't be a column containing a King, since (given that we can't remove any completed suits) the only place a King can go is into the space. And it can't be column 1 or 7, since that would require a free Queen, and there isn't any. So it must be column 6. We can get through that column by first digging through to the free 6 as described earlier, and then playing: 5h from 6 to 4, 6d from 6 to 10, 5c from 6 to 10, 3-2s from 6 to 3, 4h from 6 to 4, 3-2s from 3 to 4, 7-5c from 6 to 1. The tableau now looks like this:

| | | | | | | | | | |
|-----|----|------|----|-----|----|----|-----|----|----|
| -- | -- | (sp) | -- | Qh | -- | -- | -- | -- | -- |
| -- | -- | | Ks | Js | -- | Jc | -- | -- | -- |
| -- | -- | | 2s | 10c | -- | 8h | -- | -- | Kh |
| -- | -- | | As | | As | 7h | Kc | -- | Qc |
| Jc | Kd | | 9h | | 9h | | Qc | Kc | Jh |
| 10h | 9d | | 8d | | 8s | | Jd | Qh | Js |
| 9c | 8d | | 7s | | | | 5s | Jh | 3d |
| 8s | 7d | | 6s | | | | 4h | | 2c |
| 7d | 3h | | 5h | | | | 3c | | Ad |
| 6h | 2h | | 4h | | | | 2c | | 8h |
| 5d | Ah | | 3s | | | | Ac | | 7h |
| 3d | 2d | | 2s | | | | 10s | | 6d |
| 2d | | | | | | | 9s | | 5c |
| Ah | | | | | | | 8c | | |
| 9s | | | | | | | 7s | | |
| 8c | | | | | | | 6s | | |
| 7c | | | | | | | 5s | | |

6c
5c

4c

Once again, it's time to make contingency plans. If we just move the 9h-8s onto the 10c and the As onto the 2s, we could be in trouble if we turn up a King. The lone space won't be sufficient for us to be able to move the stuff out of column 5 onto the King. So we undo some of what we did in the course of getting the free 6: Jh from 9 to 3, 10c from 5 to 3, Js from 5 to 9, 10c from 3 to 9, Jh from 3 to 5. While we're at it, it can't hurt to move the 4c from 8 to 1, and in a moment we'll match the 8s with a 9s, too. We now proceed: 8s from 6 to 3, 9h from 6 to 9, 8-5c from 1 to 9, 8s from 3 to 1, and finally As from 6 to 4. (Once again, preparation pays off; in the game where this took place, the card turned up was indeed a King.)

Again, complete sets of clubs and hearts are available. Without dealing any more cards or turning up any face-down cards, remove a set of clubs AND a set of hearts (not necessarily in that order). Can you remove them in the other order?

| | | | | | | | | | |
|-----|----|----|-----|-----|----|----|-----|------|----|
| -- | -- | 8c | Ks | Kh | 5c | Kc | -- | (sp) | -- |
| -- | -- | | Qh | Qh | | | -- | | -- |
| -- | -- | | Jc | Jh | | | -- | | Kh |
| -- | -- | | 10c | 10c | | | Kc | | Qc |
| Jc | Kd | | 9c | 9h | | | Qc | | Jh |
| 10h | 9d | | 8c | 8d | | | Jd | | Js |
| 9s | 8d | | 7c | 7d | | | 10h | | 3d |
| 8s | 7d | | 6c | 6d | | | 9h | | 2c |
| 7s | 3h | | 5c | 5d | | | 8h | | Ad |
| 6s | 2h | | 4c | 4h | | | 7h | | 8h |
| 5s | Ah | | 3c | 3d | | | 6h | | 7h |
| 4s | 2d | | 2c | 2d | | | 5h | | |
| 3c | Ah | | Ac | | | | 4h | | |
| 2s | | | | | | | 3h | | |
| As | | | | | | | | | |

Solution:

The clubs look like the better bet, since the Jack through Ace are already assembled and there's a King-Queen in column 8. Let's see what can be done. Since there are no free 9's or 6's, we have to remove the first completed suit without the benefit of any additional spaces. Since we are also short on free 4's, this means we can't use the Qc in column 10. That seems okay; the one in column 8 looks easier to get to anyhow. All we have to do is move the Jd somewhere (along with the 10-3h). There are no free Queens, so the Jack will have to move into the space (or some other Jack must move into the space to free up a Queen). But we can't move the Jd anywhere while the hearts are there, and the only free Jack is in column 10 where we can't get at it. We could move the 10-3h into the space, but then what do we do with the Jack? Looks like the clubs aren't going to work after all.

Let's try the hearts. It looks like we'll have the same problem, since we have to move the 10c from column 5 somewhere else to clear off the K-Jh. The only place we can move the 10c is the space, and to do that we have to do something about the 9h

attached to the 10c. Since we don't have any free 10's, what can we do? The idea is to use the space to swap things around such that the sequences of a single suit are where we need them most. We do it as follows: First we get the 4h out of the way by moving 3-2d from 5 to 9, 4h from 5 to 6, and 3-2d from 9 to 6. Then we move 8-5d from 5 to 9, 8-3h from 8 to 5, 8-5d from 9 to 8, 9-3h from 5 to 9, 9-Ac from 4 to 5, 9-3h from 9 to 4, 8-5d from 8 to 9, 8-3h from 4 to 8, 8-5d from 9 to 4 (we certainly have made a mess of all those nice clubs in column 4, haven't we?), 10-Ac from 5 to 9, 10-3h from 8 to 5, 10-Ac from 9 to 8. Now we can move the Ah from 2 to 6, 2d from 2 to 9, and 2-Ah from 2 to 5 to complete the hearts. The 2d comes out of the space and back to column 2, and removing the hearts gives us a second space. With two spaces we have no trouble straightening the clubs back out and completing a set.

Note that, rather than removing the completed set of clubs from column 8, we should pile a Q-Ac into column 7 and remove the suit from there. We can always move the Kc from column 8 into the newly created space in column 7 if we wish, but by getting the space we keep our options open. Note also that, had there been a 10d around, we might have been able to pull the same trick with the Jd in column 8 as we did with the 10c in column 5; since there wasn't, though, we had to go after the hearts first.

 In the tableau below, there are two deals (20 cards) remaining. What do you do?

| | | | | | | | | | |
|-----|-----|----|----|-----|-----|-----|----|-----|----|
| Kh | Ks | Kh | Qh | Jc | Qd | Js | 9s | 10s | 6d |
| Qh | 10h | Qs | Ac | 10c | Jh | Kc | 9c | Kd | Qs |
| Jd | 9d | 8s | Ac | 9h | 10h | Qc | Kc | Qd | Js |
| 10s | 8d | 7h | 4s | 8h | 6s | Jc | 9h | Jd | |
| 9s | | 6h | 3h | | 5s | 10c | 8h | 10d | |
| 8s | | 5h | | | 4h | 9c | 7h | 9d | |
| 7s | | 4h | | | 3h | 8c | 6h | 8c | |
| 6c | | 8d | | | 2h | 7c | 5d | 7s | |
| 5c | | 7d | | | As | 6c | 4s | 6s | |
| 4c | | 6d | | | | 5c | | 5s | |
| | | 5d | | | | 4c | | | |
| | | 4d | | | | 3c | | | |
| | | 3d | | | | 2c | | | |
| | | 2d | | | | 3s | | | |
| | | Ad | | | | | | | |
| | | 7d | | | | | | | |

Solution:

If you grabbed at the opportunity to remove a set of clubs from column 7, shame on you! Once you do that, you're stuck, and except for a little bit of "naturalising" (swapping cards so as to create longer runs in a single suit) you can do nothing but deal out another round. In fact, it is possible to remove TWO suits, get two spaces, and straighten out almost all the suit changes before running out of steam. But let's start by looking at the various options available to see what our reasoning should be. Ignoring for the moment whether we can remove any suits, can we get a space? Obviously, we can't get a space in any column containing a King, which leaves columns 4, 5, 6, and 10. Column 5 is hopeless because the only free Queens (columns 3 and 4) cannot be reached without either two free 9's or two free deuces.

We have one free deuce (column 7) and both free 9's are trapped under a King. Getting through any of the other columns requires a free King. The King in column 8 cannot be reached without the temporary use of a free 6, and the only such 6 is under a Queen and thus requires another free King to reach. On the other hand, we CAN reach the King in column 2. But in order to do so we need temporary use of a free 10, which means we'll have had to move the 6s from column 6 onto our only free 7. Thus, though we might be able to move the Qs out of column 10, we wouldn't have any place to move the 6d. And, since we lack a free Queen on which to park the Jh from column 6, the free King won't be enough to get through that column. Column 4 we've already identified as being hopeless. Thus we conclude that we can't get a space without removing any suits.

Now what? If we remove the clubs from column 7, all we get is a free Jack, which we have no use for, and which we can't move out of the way. We can't remove a set of spades since we have no 2s showing, and likewise there's no Ah visible. We can't remove diamonds (at least, not first) because we can't get to the Kd without a free 9 on which to park the 8c, and both free 9's are trapped under a Kc. So it looks like the first order of business is to remove a set of clubs from column 8, if possible.

That's a big "if"; it looks rather hopeless. Digging through to the Kc requires temporary use of a free 5 and 6, and permanent use of a free 10. Well, a moment ago we said we might be able to reach the 6d in column 10. Can we in fact do so? Yes, if we're VERY careful! Once we uncover the Ks in column 2, we want to be able to move the Q-Js from column 10, so we can't afford to put the 10h from column 2 on top of them. That means we have to find a 10s to move to column 10, thereby freeing up a different Jack. Such a 10 is in column 1, and we'd better move it BEFORE using up the free 7! Without further ado, here we go: 6-4c from 1 to 3, 10-7s from 1 to 10, 3s from 7 to 8, As from 6 to 7, 4-2h from 6 to 9, 6-5s from 6 to 10 (conveniently the correct suit), 9-8d from 2 to 6, 10h from 2 to 1, Q-5s from 10 to 2, 4-3s from 8 to 2, 5d from 8 to 10, 9-6h from 8 to 1, As from 7 to 9, Q-2c from 7 to 8, 3h from 4 to 3, 4s from 4 to 10, Ac from 4 to 8, and voila! we remove a set of clubs from column 8. Here's the new tableau:

| | | | | | | | | | |
|-----|-----|----|----|-----|-----|----|----|-----|----|
| Kh | Ks | Kh | Qh | Jc | Qd | Js | 9s | 10s | 6d |
| Qh | Qs | Qs | Ac | 10c | Jh | Kc | 9c | Kd | 5d |
| Jd | Js | 8s | | 9h | 10h | | | Qd | 4s |
| 10h | 10s | 7h | | 8h | 9d | | | Jd | |
| 9h | 9s | 6h | | | 8d | | | 10d | |
| 8h | 8s | 5h | | | | | | 9d | |
| 7h | 7s | 4h | | | | | | 8c | |
| 6h | 6s | 8d | | | | | | 7s | |
| | 5s | 7d | | | | | | 6s | |
| | 4s | 6d | | | | | | 5s | |
| | 3s | 5d | | | | | | 4h | |
| | | 4d | | | | | | 3h | |
| | | 3d | | | | | | 2h | |
| | | 2d | | | | | | As | |
| | | Ad | | | | | | | |
| | | 7d | | | | | | | |
| | | 6c | | | | | | | |
| | | 5c | | | | | | | |
| | | 4c | | | | | | | |
| | | 3h | | | | | | | |

Unfortunately, though we've uncovered a free 9, there's no longer anything we can do with it, because we've added some crud to column 9, not to mention column 3. Furthermore, if we're going to form a set of diamonds, we'd best not lose track of the stuff in column 3. So let's go back to the very beginning and try again, this time keeping things a bit more available: 7d from 3 to 5, 6-4c from 1 to 5, 10-7s from 1 to 10, 3s from 7 to 8, As from 6 to 7, 4-2h from 6 to 9, 6-5s from 6 to 10, 9-8d from 2 to 6, 10h from 2 to 1, Q-5s from 10 to 2, 4-3s from 8 to 2, 5d from 8 to 10, 9-6h from 8 to 1, 4-2h from 9 to 10, As from 7 to 10, Q-2c from 7 to 8, 3h from 4 to 5, 4s from 4 to 9, Ac from 4 to 8, and again we are able to remove a set of clubs from column 8. Now, however, the tableau looks like this:

| | | | | | | | | | |
|-----|-----|----|----|-----|-----|----|----|-----|----|
| Kh | Ks | Kh | Qh | Jc | Qd | Js | 9s | 10s | 6d |
| Qh | Qs | Qs | Ac | 10c | Jh | Kc | 9c | Kd | 5d |
| Jd | Js | 8s | | 9h | 10h | | | Qd | 4h |
| 10h | 10s | 7h | | 8h | 9d | | | Jd | 3h |
| 9h | 9s | 6h | | 7d | 8d | | | 10d | 2h |
| 8h | 8s | 5h | | 6c | | | | 9d | As |
| 7h | 7s | 4h | | 5c | | | | 8c | |
| 6h | 6s | 8d | | 4c | | | | 7s | |
| | 5s | 7d | | 3h | | | | 6s | |
| | 4s | 6d | | | | | | 5s | |
| | 3s | 5d | | | | | | 4s | |
| | | 4d | | | | | | | |
| | | 3d | | | | | | | |
| | | 2d | | | | | | | |
| | | Ad | | | | | | | |

Now we can get out a set of diamonds as follows: 7-4s from 9 to 6, 8c from 9 to 8, 8-Ad from 3 to 9, and remove the diamonds:

| | | | | | | | | | |
|-----|-----|----|----|-----|-----|----|----|-----|----|
| Kh | Ks | Kh | Qh | Jc | Qd | Js | 9s | 10s | 6d |
| Qh | Qs | Qs | Ac | 10c | Jh | Kc | 9c | | 5d |
| Jd | Js | 8s | | 9h | 10h | | 8c | | 4h |
| 10h | 10s | 7h | | 8h | 9d | | | | 3h |
| 9h | 9s | 6h | | 7d | 8d | | | | 2h |
| 8h | 8s | 5h | | 6c | 7s | | | | As |
| 7h | 7s | 4h | | 5c | 6s | | | | |
| 6h | 6s | | | 4c | 5s | | | | |
| | 5s | | | 3h | 4s | | | | |
| | 4s | | | | | | | | |
| | 3s | | | | | | | | |

Well, looking better, but it's still not obvious where we can find a space. Based on the "free" cards, there are only two possibilities: either we use the 10s in column 9 to uncover the 9s in column 8 and thus the Qs in column 3 and thus get a space in column 5, or we dig through column 6. Column 5 doesn't work because we need temporary use of a free 7. It may be that, by judicious advance planning, we could have arranged to have a clearer path through this column (e.g., by building column 1's hearts in column 5), but we needn't go back for a third try because we can get through column 6 anyway. We'll need temporary use of an 8, 10, and Queen, and getting the Queen will require permanent use of the 10, so we have to do things in the right order again. Moreover, we have to be careful not to build anything new in column 6 that will be hard to move out later. So we do it this way: 7-4s from 6 to 8, 9-8d from 6 to 9, 7-4s from 8 to 9, 9-6h from 1 to 6, 9-8c from 8 to 1, 7-4h from 3 to 1, 8s from 3 to 8, J-6h from 6 to 3, Q-3s from 2 to 7 (to prepare for later), and Qd from 6 to 2. And here we are:

| | | | | | | | | | |
|-----|----|-----|----|-----|------|-----|----|-----|----|
| Kh | Ks | Kh | Qh | Jc | (sp) | Js | 9s | 10s | 6d |
| Qh | Qd | Qs | Ac | 10c | | Kc | 8s | 9d | 5d |
| Jd | | Jh | | 9h | | Qs | | 8d | 4h |
| 10h | | 10h | | 8h | | Js | | 7s | 3h |
| 9c | | 9h | | 7d | | 10s | | 6s | 2h |
| 8c | | 8h | | 6c | | 9s | | 5s | As |
| 7h | | 7h | | 5c | | 8s | | 4s | |
| 6h | | 6h | | 4c | | 7s | | | |
| 5h | | | | 3h | | 6s | | | |
| 4h | | | | | | 5s | | | |
| | | | | | | 4s | | | |
| | | | | | | 3s | | | |

Without detailing the exact moves from here on, the next steps should probably be something like this: Jc-3h from column 5 onto Qd in column 2, getting second space. Swap 9-8d in column 9 with 9-8s in column 8 to form 10-4s in one chunk. Move Kc-3s from column 7 into a space and get the space back by moving 10-4s onto Js. Move Ac from column 4 into a space and get the space back by moving J-6h from column 3 onto Qh and J-4s onto Qs. After a bit more "naturalising", you should have a tableau something like:

| | | | | | | | | | |
|-----|-----|-----|------|----|-----|-----|----|------|----|
| Kh | Ks | Kh | (sp) | 9d | Kc | Qs | Ac | (sp) | 6c |
| Qh | Qs | Qh | | 8d | Qd | Js | | | 5c |
| Jc | Js | Jh | | 7d | Jd | 10s | | | 4c |
| 10c | 10s | 10h | | 6d | 10h | 9s | | | |
| 9c | 9s | 9h | | 5d | 9h | 8s | | | |
| 8c | 8s | 8h | | 4h | 8h | 7s | | | |
| | 7s | 7h | | 3h | 7h | 6s | | | |
| | 6s | 6h | | | 6h | 5s | | | |
| | 5s | 5h | | | | 4s | | | |
| | 4s | 4h | | | | | | | |
| | 3s | 3h | | | | | | | |
| | | 2h | | | | | | | |
| | | As | | | | | | | |

This is as much straightening out as you can accomplish with the cards available, so it's finally time to deal another round. But first, you have to fill in the spaces (them's the rules!). So how should you fill them in? It's largely a matter of personal preference, but one likely possibility is to move the Q-Jd into one space and the 10-6h into the other. The reason for this is that there's already a Queen in a space, so by creating a free King you have an extra chance at a space early in the next round. Granted that you are almost certain to win at this point, but you might as well maximise your chances anyway!

Can a set of spades be removed WITHOUT first getting a space or dealing any more cards? If so, how? If not, prove it! Would it make any difference if the Js in column 7 were swapped with the Jd in column 9? (The second "garbage" line above is for this modified tableau.) Finally, given that it can be done, remove a set of hearts (as usual, without dealing any more cards). What is the minimum number of other suits

that must be removed in order to do so? Does the order of the two face-down cards matter?

| | | | | | | | | | |
|-----|-----|-----|----|-----|----|-----|----|----|----|
| Kd | Jc | 9h | 9c | Qh | 9d | Qc | Ks | -- | Qs |
| Qd | 10c | 10s | 8c | Jc | Qh | Kc | Js | -- | Kc |
| Jd | 9c | | 5s | 10h | Jh | Qs | 2d | Jd | 3c |
| 10d | 8c | | 7d | 9h | Ad | Js | Ac | 7d | |
| 9d | 7c | | Kd | 8h | | 10d | 7h | 6h | |
| 8d | 6c | | | 6s | | 9s | | 5c | |
| 7h | 5c | | | 5s | | 8s | | 4h | |
| 6d | 4s | | | 4s | | 7s | | 3h | |
| 5d | 3s | | | 3s | | 6s | | 2d | |
| 4d | 2s | | | 2c | | Qd | | Ah | |
| 3d | As | | | 6h | | | | 4c | |
| 2h | As | | | 5d | | | | 3c | |
| Ah | | | | 4d | | | | 2c | |
| 8h | | | | 9s | | | | Ac | |
| | | | | | | | | 7c | |

Solution:

This is a complicated one, so take a deep breath! (If you didn't find it complicated, then perhaps you weren't thorough in your analysis. Unless you (a) decided the spades could not be removed without getting a space, (b) realised that swapping the Jacks affects this, and (c) considered the 9d in column 1 at some point in your proof, your analysis is incomplete.)

First let's consider the problem of putting together a set of spades. We begin by finding all the pieces. The only Ks is in column 8; the only Qs we can possibly get to without a space is in column 7. (Actually, we shouldn't be too hasty; if we could remove a set of clubs without getting a space, we could reach the Qs in column 10. But in moving the Qs we'd create a space, whether we needed it or not; and besides, the only Qc is in column 7 with the other Kc in the way.) In digging to the Ks and Qs we'll reach both Jacks, so they shouldn't be a problem. The 10s is in column 3, and the remaining spades are at various depths in columns 2, 5, and 7. Can we pull all these cards together?

To get to the Ks we need a free 8, a free 3, and a free Queen (even though we may end up using the Js from column 8, we need some place to put it in order to get to the King). The 8 in column 4 is inaccessible unless we can remove a set of diamonds, which in turn is impossible without a space since the 7d in column 4 is inaccessible and likewise for the 7d in column 9 due to the absence of free 5's. But we have a free 8 in column 1 and another in column 5 (if we can reach it), so there's no problem with that. We also have exactly one free 3, and one free Queen. So far so good. Can we reach the Qs in column 7? That requires a free King, which is no problem. It also requires someplace to move the 9-6s and the 10d. This should pose no problem either. Note that, though we need a free 10 and a free Jack for this, we don't "use up" those free cards by moving the 9-6s and 10d, since we uncover another 10 and Jack to become new free cards. However, notice that we're eventually going to have to reach the 5s in column 5, and this will use up the free 10. So we have to dig through column 7 before that. In fact, we have to move the 10d out of column 7 before moving the 9s out of column 5, because once we move the latter we'll have 9's on all the 10's, and the 10d won't be movable. Or will it? If we could put a 9d onto the 10d (freeing up a different 10), we could move the 9s onto the newly freed 10 and still be able to move the 10d. Let's assume for the moment that this is

impossible (we'll prove it later, but don't want to digress too far here). To repeat, then, we need to move the 10d out of column 7 before moving the 9s out of column 5. Where does the 10d go? The free Jack in column 9 is inaccessible without a free 5, and the other free Jacks (in columns 6 and 8) each require a free deuce (even though the Jack in column 8 doesn't require us to use up the deuce permanently). The only free deuce is in column 5, and we can't get to it without moving the 9s. So we're stuck!

Now let's follow out that digression and make sure we can't get a 9d onto the 10d. We certainly can't use the 9d in column 6, since that would create a space, which is verboten. In order to reach the 9d in column 1, we'd have to move the 8h. If we put it onto the 9s in column 5, we would then be unable to move that 9s later on (we have only one free 9 available; as we'll see later, we can't get to the one in column 3 without moving the 9s from column 5). If we moved the 8-6s from column 7 onto the 9s in column 5, and then moved the 8h onto the newly freed 9s, we wouldn't be able to move THAT 9s later, so we either wouldn't be able to reach the Qs (if we had left the 9s in column 7 when we put the 8h on it) or else we'd be unable to reach the 10s (if we had moved the 9s there first). So, although we might be able to get the 9d from column 1 onto the 10d in column 7, by the time we did so we'd have made a hopeless mess out of the spades. The conclusion from all this is that it's impossible to remove a set of spades without first getting a space.

Now, what if the Jacks were swapped as described? In that case, we wouldn't need a free Jack on which to park the 10d; we could move the J-10d as a unit. So the plan is to move the Qd out of column 7, followed by the 9-6s and J-10d. Then we can use up the free 10 by moving the 9s out of column 5 and finish bringing together the spades. The complete sequence is: Qd from 7 to 4, 9-6s from 7 to 3, J-10d from 7 to 4, 9s from 5 to 4, 5-4d from 5 to 3, 7h from 8 to 1, 6h from 5 to 1, 5-4d from 3 to 1, 2c from 5 to 10, 5-3s from 5 to 3, Ac from 8 to 10, and now we have to be careful not to move the 2d from column 8 onto the spades in column 3, so instead we move 3s from 3 to 1, 2d from 8 to 1, Js from 8 to 7, Q-Js from 7 to 8, 10-4s from 3 to 8, As from 2 to 1, and 3-As from 2 to 8. Voila!

That was for warm-up; what about removing the set of hearts? The first step is easy: we look around to see where all the hearts are and find that the King and 5 are missing. Hence these must be the two face-down cards. It remains to be seen whether their order is significant.

In the course of discussing the spades, we observed that we cannot remove a set of diamonds or clubs without first getting a space, and we also proved the same thing for the spades. Since we can't get past the 4c in column 9 without a space, it looks like our first order of business is getting one. Columns 1, 4, 7, 8, 9, and 10 are out, for obvious reasons. Column 3 looks like the best bet, but in order to move the 10s we need a free Jack, and that in turn requires a free deuce, and THAT requires that we move the 9s from column 5 onto the 10s. Thus, by the time we manage to move the 10s, we'll no longer have a free 10 on which to put the 9h to get the space. Column 6 is similarly hopeless; in order to move the Ad we need to use up the free 10. Column 2 is out of the question since there's no place to put the 4-As. That leaves column 5.

To get through column 5 we need to use up a 10, two 7's, and a King, and we also need temporary use of a 6, 3, Jack, and Queen. Getting the Jack will be no trouble once we've gotten to the 2c, and getting the 6 just needs another free King, which we

can get from either column 8 or column 10. Let's use the one in column 10; the only thing we have to watch out for is that if we wait too long to uncover that King (in particular, if we wait until we need it to put the Qh on to clear the space), we may find the 3c is immovable due to our having moved stuff onto it in the meanwhile. So we have to move the 3c onto the 4d at some early opportunity. Here we go: 9s from 5 to 3, Qd from 7 to 4, 5-4d from 5 to 7, 6h from 5 to 8, 2c from 5 to 10, 6-3s from 5 to 9, 3-2c from 10 to 7, Ad from 6 to 7, 10-8h from 5 to 6, Jc from 5 to 4, and finally Qh from 5 to 10. The tableau now looks like this:

| | | | | | | | | | |
|-----|-----|-----|----|------|-----|-----|----|----|----|
| Kd | Jc | 9h | 9c | (sp) | 9d | Qc | Ks | -- | Qs |
| Qd | 10c | 10s | 8c | | Qh | Kc | Js | -- | Kc |
| Jd | 9c | 9s | 5s | | Jh | Qs | 2d | Jd | Qh |
| 10d | 8c | | 7d | | 10h | Js | Ac | 7d | |
| 9d | 7c | | Kd | | 9h | 10d | 7h | 6h | |
| 8d | 6c | | Qd | | 8h | 9s | 6h | 5c | |
| 7h | 5c | | Jc | | | 8s | | 4h | |
| 6d | 4s | | | | | 7s | | 3h | |
| 5d | 3s | | | | | 6s | | 2d | |
| 4d | 2s | | | | | 5d | | Ah | |
| 3d | As | | | | | 4d | | 4c | |
| 2h | As | | | | | 3c | | 3c | |
| Ah | | | | | | 2c | | 2c | |
| 8h | | | | | | Ad | | Ac | |
| | | | | | | | | 7c | |
| | | | | | | | | 6s | |
| | | | | | | | | 5s | |
| | | | | | | | | 4s | |
| | | | | | | | | 3s | |

Where do we go from here? Well, we're trying to minimize the number of suits (other than hearts) removed, so let's see if we can get the hearts out right away. We would need to dig through column 9; to do that we would have to move the 4-Ac into the space (or onto a free 5; we'll come back to this), after which we would have no place to move the 4-3h. If we could get a free 5 without using up the space, we might fare better, but the only free 5 is in column 4, and to get to it we must put the Kd into the space (remember we're assuming we're not going to remove any other suits) and we have no free 10 with which to restore the space via column 4. Nor can we get any more spaces; all columns contain Kings or 9's or Aces, and there are no free 10's or deuces, so digging through any pile would cost us the space, and would get us at most one space in return. Thus we conclude that we must remove another suit before the hearts. Which suit is it to be? It can't be clubs. To reach the 10c (in column 2) we must move the first As into the space, since there are no free deuces anywhere. Having done so, we have no place to move the 4-As. (We have already noted that getting to the free 5 costs us the space.) On the other hand, we CAN remove either diamonds or spades. (If you thought you HAD to remove the diamonds, you might want to take a moment to study the above tableau and figure out how to remove the spades instead.) Let's look at the diamonds first. Most of them are already in column 1; all we need to dredge up are the 7, 2, and Ace. We'll ignore the diamonds in column 9 (we know we can't reach the 7d there, and the 2d is less accessible than that in column 8), and proceed thusly: 7-6h from 8 to 6, Ac from 8 to 5, Ad from 7 to 8, Ac from 5 to 7, 8h from 1 to 3, 2-Ah from 1 to 9, 2-Ad from 8 to 1, Jc from 4 to 10, K-Qd from 4 to 5, 6-Ad from 1 to 4, 7h from 1 to 3, and 7-Ad from 4 to 1. Removing the diamonds from column 1 would give us this position:

| | | | | | | | | | |
|------|-----|-----|----|----|-----|-----|----|----|----|
| (sp) | Jc | 9h | 9c | Kd | 9d | Qc | Ks | -- | Qs |
| | 10c | 10s | 8c | Qd | Qh | Kc | Js | -- | Kc |
| | 9c | 9s | 5s | | Jh | Qs | | Jd | Qh |
| | 8c | 8h | | | 10h | Js | | 7d | Jc |
| | 7c | 7h | | | 9h | 10d | | 6h | |
| | 6c | | | | 8h | 9s | | 5c | |
| | 5c | | | | 7h | 8s | | 4h | |
| | 4s | | | | 6h | 7s | | 3h | |
| | 3s | | | | | 6s | | 2d | |
| | 2s | | | | | 5d | | Ah | |
| | As | | | | | 4d | | 4c | |
| | As | | | | | 3c | | 3c | |
| | | | | | | 2c | | 2c | |
| | | | | | | Ac | | Ac | |
| | | | | | | | | 7c | |
| | | | | | | | | 6s | |
| | | | | | | | | 5s | |
| | | | | | | | | 4s | |
| | | | | | | | | 3s | |
| | | | | | | | | 2h | |
| | | | | | | | | Ah | |

Now, before we pursue this any further, let's go back and see how we can remove the spades instead. If we try to do so in the straightforward manner, we run into trouble. Presumably we would uncover the Ks in column 8 by moving the 7-6h onto an 8 and the 2d-Ac onto a 3 (probably swapping the Ac/Ad as we did in the previous paragraph). We would then move the Js out of column 8 and bring in a pile of spades from columns 7 (Q-J, 8-6), 3 (10-9), and 9 (5-3), piling them all onto the King. But then we'd be unable to get to the 2s in column 2. (Once we moved the first As into the space, we'd be unable to swap the 2-As with the 2-Ad (or whatever) blocking off the 3s in column 8.) The way out of this bind is to wait until the last minute to move anything onto the 3s, such that when we do it's the 2-As, and thus we won't need the space afterward. Here's how we can do it: 7-6h from 8 to 6, Ac from 8 to 5, Ad from 7 to 8, Ac from 5 to 7, 3-Ac from 7 to 5, 5-4d from 7 to 6, 3-Ac from 5 to 6, 8-6s from 7 to 3, 9s from 7 to 5, 10d from 7 to 4, 9s from 5 to 4, 10-6s from 3 to 7, 5-3s from 9 to 7. Now we're ready to go: As from 2 to 5, 2-As from 2 to 7, 2-Ad from 8 to 2, Js from 8 to 10, and Q-As from 7 to 8. Removing the suit gives this tableau:

| | | | | | | | | | |
|-----|-----|----|-----|----|-----|----|------|----|----|
| Kd | Jc | 9h | 9c | As | 9d | Qc | (sp) | -- | Qs |
| Qd | 10c | | 8c | | Qh | Kc | | -- | Kc |
| Jd | 9c | | 5s | | Jh | | | Jd | Qh |
| 10d | 8c | | 7d | | 10h | | | 7d | Js |
| 9d | 7c | | Kd | | 9h | | | 6h | |
| 8d | 6c | | Qd | | 8h | | | 5c | |
| 7h | 5c | | Jc | | 7h | | | 4h | |
| 6d | 4s | | 10d | | 6h | | | 3h | |
| 5d | 3s | | 9s | | 5d | | | 2d | |
| 4d | 2d | | | | 4d | | | Ah | |
| 3d | Ad | | | | 3c | | | 4c | |
| 2h | | | | | 2c | | | 3c | |
| Ah | | | | | Ac | | | 2c | |
| 8h | | | | | | | | Ac | |

7c
6s

Now, which of these two positions (resulting from removing either diamonds or spades) is better with regard to our ultimate goal -- the hearts? Well, in the tableau immediately above (with the spades removed), we still can't get through column 9 (same reasoning as before), nor can we get any more spaces (column 2 is the only chance, but we can't get through it). And since we can't get through column 2, we can't remove a set of clubs yet, so all we can do is remove a set of diamonds. If that's the case, we might as well have removed the diamonds first and then seen whether we could do without removing the spades! So we'll use the earlier tableau and proceed from there.

Now we can dig through column 9 and turn up a new card, but we'll lose the space in the process, because we've got only one free 8 left. Furthermore, to get to that free 8 we must use up our only free 6, so no matter which heart gets turned up we won't be able to move it, nor can it possibly get us the space back. Furthermore, we still can't get any additional spaces (short of removing more suits) due to the lack of free 10's and deuces. Thus we can't get out a set of hearts yet, but we're getting closer!

What next? We can now remove either spades or clubs. Either way we end up getting a new space. Removing the clubs has the advantage that it digs all the way to the 4-Ac in column 9, so let's try that approach. We'll start by dredging out the Qc: 3-Ac from 7 to 1, 5-4d from 7 to 6, 3-Ac from 1 to 6, 9-6s from 7 to 1, 10d from 7 to 10, 9-6s from 1 to 10, Js from 8 to 5, Q-Js from 7 to 8, Kc from 7 to 1, Qc from 7 to 1. Now we finish the job: As from 2 to 7, 4-As from 2 to 4, J-5c from 2 to 1, 2-Ah from 9 to 2, 6-3s from 9 to 3, 2-Ah from 2 to 3, 5-As from 4 to 10, 7c from 9 to 4, 4-Ac from 9 to 1. Removing the clubs from column 1 yields:

| | | | | | | | | | |
|------|------|-----|----|----|-----|----|----|----|-----|
| (sp) | (sp) | 9h | 9c | Kd | 9d | As | Ks | -- | Qs |
| | | 10s | 8c | Qd | Qh | | Qs | -- | Kc |
| | | 9s | 7c | Js | Jh | | Js | Jd | Qh |
| | | 8h | | | 10h | | | 7d | Jc |
| | | 7h | | | 9h | | | 6h | 10d |
| | | 6s | | | 8h | | | 5c | 9s |
| | | 5s | | | 7h | | | 4h | 8s |
| | | 4s | | | 6h | | | 3h | 7s |
| | | 3s | | | 5d | | | 2d | 6s |
| | | 2h | | | 4d | | | Ah | 5s |
| | | Ah | | | 3c | | | | 4s |
| | | | | | 2c | | | | 3s |
| | | | | | Ac | | | | 2s |
| | | | | | | | | | As |

Surely two spaces will suffice! Except that now we've used up the last of the free 8's, so both the 7d and the Jd will cost us spaces (we can move the Jd onto the Qs in column 10, but that too costs us a space). If the 5h turns up, we'll be stuck, but what if we get the Kh? Then, with a bit of judicious planning, we can move the Qs out of column 10 onto the Kh. (The planning involves putting a Js on the Qs so the Jd can go elsewhere.) But the lone space won't be enough to get the Kh off of column 9, once the Q-Js are placed with it. So we must plan even further and leave a Q-Jh to be picked up by the Kh. This is our only hope of getting the hearts out (without removing the spades), so let's see how it works out: 9-As from 10 to 1, 10d from 10 to

5, 9-As from 1 to 5, 3-Ac from 6 to 1, 5-4d from 6 to 2, 10-6h from 6 to 8, 3-Ac from 1 to 2, Jc from 10 to 1, Jh from 6 to 10, Jc from 1 to 6. Now we've got the Jh with the Qh that we can move. (We can't move the Qh in column 6 since that would cost us a space.) Continuing: 5-As from 5 to 8, 3-Ac from 2 to 1, 5-4d from 2 to 5, 3-Ac from 1 to 5, Ah from 9 to 1, 2d from 9 to 2, 2-Ah from 3 to 9, 2d from 2 to 3, Ah from 1 to 3, 4-Ah from 9 to 1, 5c from 9 to 2, 6h from 9 to 4, 5c from 2 to 4, 4-Ah from 1 to 4, Q-Jh from 10 to 1, Kc from 10 to 2, Qs from 10 to 2, 7d from 9 to 10, Jd from 9 to 2, and we assume the Kh is turned up. We move Q-Jh from 1 to 9 and reach the following position:

| | | | | | | | | | |
|------|----|-----|----|-----|----|----|-----|----|----|
| (sp) | Kc | 9h | 9c | Kd | 9d | As | Ks | -- | 7d |
| | Qs | 10s | 8c | Qd | Qh | | Qs | Kh | |
| | Jd | 9s | 7c | Js | Jc | | Js | Qh | |
| | | 8h | 6h | 10d | | | 10h | Jh | |
| | | 7h | 5c | 9s | | | 9h | | |
| | | 6s | 4h | 8s | | | 8h | | |
| | | 5s | 3h | 7s | | | 7h | | |
| | | 4s | 2h | 6s | | | 6h | | |
| | | 3s | Ah | 5d | | | 5s | | |
| | | 2d | | 4d | | | 4s | | |
| | | Ah | | 3c | | | 3s | | |
| | | | | 2c | | | 2s | | |
| | | | | Ac | | | As | | |

Unfortunately, despite our best preparations, we will be unable to combine the hearts once we move the K-Jh into the space and turn up the 5h. We could go back and try removing the spades instead of the clubs earlier, but it wouldn't help. We must remove both the spades AND the clubs (and the diamonds) before removing the hearts. We can't get the spades together starting with the above tableau -- we can't get through column 3 with only one space. So we'll back up to the previous tableau and proceed thusly: 2-Ah from 3 to 1, 6-3s from 3 to 4, 8-7h from 3 to 2, 10-9s from 3 to 8, 8-7h from 2 to 3, Ah from 9 to 2, 2d from 9 to 4, Ah from 2 to 4, 2-Ah from 1 to 9, 8-As from 10 to 8, and remove the spades. We now have this:

| | | | | | | | | | |
|------|------|----|----|----|-----|----|------|----|-----|
| (sp) | (sp) | 9h | 9c | Kd | 9d | As | (sp) | -- | Qs |
| | | 8h | 8c | Qd | Qh | | | -- | Kc |
| | | 7h | 7c | Js | Jh | | | Jd | Qh |
| | | | 6s | | 10h | | | 7d | Jc |
| | | | 5s | | 9h | | | 6h | 10d |
| | | | 4s | | 8h | | | 5c | 9s |
| | | | 3s | | 7h | | | 4h | |
| | | | 2d | | 6h | | | 3h | |
| | | | Ah | | 5d | | | 2h | |
| | | | | | 4d | | | Ah | |
| | | | | | 3c | | | | |
| | | | | | 2c | | | | |
| | | | | | Ac | | | | |

With THREE spaces we should have no trouble! Then again, considering how careful we had to be to even come close using two spaces, perhaps we should be cautious! If we just start dumping things into spaces we may find we don't have enough spaces to move things around once we know what we want moved. So we'll start by gathering what hearts we have: 3-Ac from 6 to 1, 5-4d from 6 to 2, 6h from 6 to 3, 5-4d from 2 to 3, 3-Ac from 1 to 3, 4-Ah from 9 to 1, 5c from 9 to 2, 6h from 9 to 6, 5c from 2 to 6, 4-Ah from 1 to 6. Now, if we stuff the 7d and Jd from column 9 into a pair of spaces, and the 5h turns up, we can move 4-Ah from 6 to 9, 5c from 6 to 8, 5-Ah from 9 to 6, and Q-Ah from 6 onto the newly revealed Kh. But if the Kh is the first card turned up, we'll be in rough shape. So let's prepare for that contingency just as we did in our earlier attempt. We move 9s from 10 to 1, 10d from 10 to 5, 9s from 1 to 5, 4-Ah from 6 to 1, 5c from 6 to 2, J-6h from 6 to 8, Jc from 10 to 6, J-6h from 8 to 10, 10-6h from 10 to 6, 5c from 2 to 6, 4-Ah from 1 to 6, Q-Jh from 10 to 8, Kc from 10 to 1, Qs from 10 to 1, 7d from 9 to 10, and here we are:

| | | | | | | | | | |
|----|------|----|----|-----|-----|----|----|----|----|
| Kc | (sp) | 9h | 9c | Kd | 9d | As | Qh | -- | 7d |
| Qs | | 8h | 8c | Qd | Qh | | Jh | -- | |
| | | 7h | 7c | Js | Jc | | | Jd | |
| | | 6h | 6s | 10d | 10h | | | | |
| | | 5d | 5s | 9s | 9h | | | | |
| | | 4d | 4s | | 8h | | | | |
| | | 3c | 3s | | 7h | | | | |
| | | 2c | 2d | | 6h | | | | |
| | | Ac | Ah | | 5c | | | | |
| | | | | | 4h | | | | |
| | | | | | 3h | | | | |
| | | | | | 2h | | | | |
| | | | | | Ah | | | | |

No matter which heart is revealed when we move the Jd from 9 to 1, we will be able to finish combining the hearts.

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