5-Card Trick

To my accomplice for the “5-Card Trick”. In this trick, I’ll put 5 cards on the table in the shape of a “T”, always with the bottom card face down as in the following 2 examples. For the 3 cards in the top row, let each face-down card be a “0” and each face-up card be a “1”, then you get a 3-digit binary number. Here are two examples illustrating this and the rest of the trick.

Example 1. Solution: the top row gives the binary number 3, count up 3 cards from the next card, and that gives the hidden card to be the 8 of Hearts.

\[
\begin{array}{ccc}
?? & 2♣ & 7♥ \\
5♥ & 6♥, 7♥, 8♥ \\
?? & = 8♥
\end{array}
\]

Example 2. Suppose the five cards are as follows.

\[
\begin{array}{ccc}
3♠ & ?? & K♢ \\
Q♣ & K♣, A♠, 2♣, 3♠, 4♣ \\
?? & = 4♠
\end{array}
\]

Solution: the top row gives the binary number 5, count up 5 cards from the next card, and that gives the hidden card to be the 4 of Spades. Note here how we count “up” from ace to 2”.

For your information, here are the binary numbers from 1 to 7.

<table>
<thead>
<tr>
<th>Binary Number</th>
<th>001</th>
<th>010</th>
<th>011</th>
<th>100</th>
<th>101</th>
<th>110</th>
<th>111</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decimal Number</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Question for the audience: Why can you always do this?