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.

$$\boxed{??}\ \boxed{2\clubsuit}\ \boxed{7\diamondsuit} \qquad \equiv 011 \equiv 3$$

$$\boxed{5\heartsuit} \qquad \boxed{6\heartsuit}, \boxed{7\heartsuit}, \boxed{8\heartsuit}$$

$$\boxed{??} \qquad \equiv \boxed{8\heartsuit}$$

Example 2. Suppose the five cards are as follows.

$$\boxed{3\clubsuit}\ \boxed{??}\ \boxed{K\diamondsuit} \qquad \equiv 101 \equiv 5$$

$$\boxed{Q\spadesuit} \qquad \boxed{K\spadesuit}, \boxed{A\spadesuit}, \boxed{2\spadesuit}, \boxed{3\spadesuit}, \boxed{4\spadesuit}$$

$$\boxed{??} \qquad \equiv \boxed{4\spadesuit}$$

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.

Binary Number	001	010	011	100	101	110	111
Decimal Number	1	2	3	4	5	6	7

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