Elknase Card System

Dominic Dietiker

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1 Synopsis

Card System based on Si Stebbins stack with improved visual disguise. From the bottom card, the top card is calculated quickly. Other positions are only a matter of practice.

2 Appearance

Whereas the Si Stebbins stack easily unveils an obvious pattern to any layperson putting it under scrutiny, the Elknase Card System might even fool an expert:

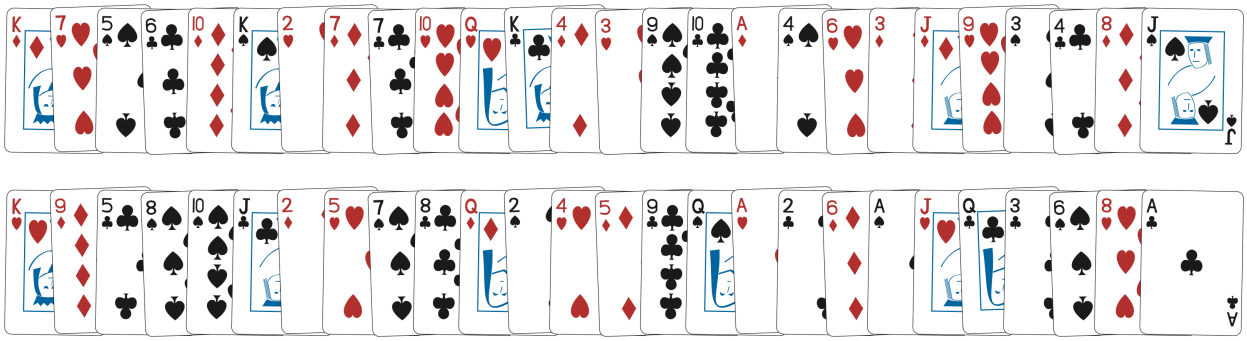

Figure 1: Elknase Card System

3 Philosophy

It's virtually impossible to create a system with appropriate visual disguise without making it overly complicated. That's why the Elknase Card System utilizes a two-tier approach. A mathematical tier wrapped in another tier cloaking the former's visual pattern. Figure 1 shows you the result of this process. The mathematical tier unwrapped looks as follows:

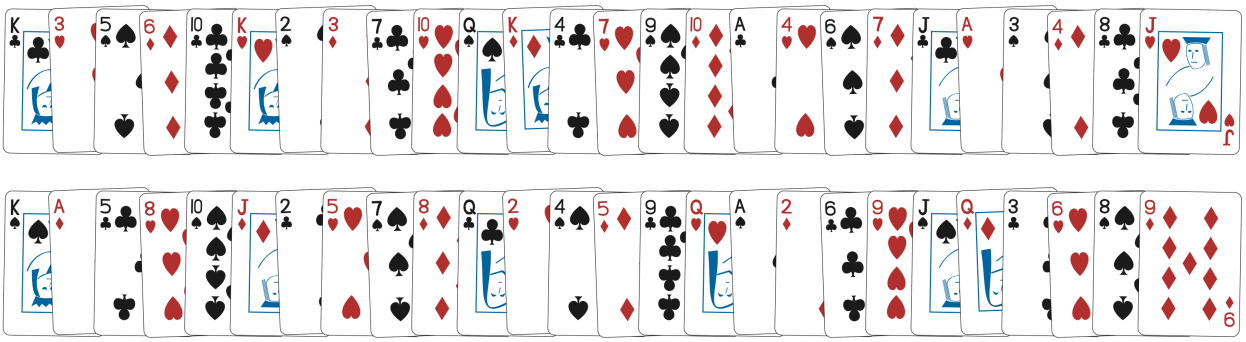

Figure 2: Elknase Card System *(Mathematical tier)*

4 Elknase Card System Features I

4.1 Card values

The rules for card values are given below:

- Aces → 1, Kings → 13, Queens → 12, Jacks → 11.
- All other cards count face value.

4.2 Mathematical tier

Starting with the king of clubs, stacking the deck according to the following rules results in what you already know from Figure 2:

- **CHaSeD** order: ♣(Clubs), ♥(Hearts) , ♠(Spades), ♦(Diamonds)
- ♣ = +3, ♥ = +2, ♠= +1, ♦ = +4

4.3 Encoding the Mathematical tier

After having obtained the Mathematical tier, encoding works as follows:

1. Switch **odd card values** of colored suits (♥,♦) for their *complement values* to 10.
   Complement values: $1 \to 9$, $3 \to 7$, $5 \to 5$, $7 \to 3$, $9 \to 1$

2. Switch suits for Kings, Queens, Jacks, Aces and even values from 10-2:
   ♣→♦, ♦→♣, ♠→♥, ♥→♠

Note: The first encoding rule cannot be applied after the second encoding rule made the card fit to work with the first rule!

4.4 Decoding the Mathematical tier

Simply enough, the reversal of the previous process:

1. Switch suits for Kings, Queens, Jacks, Aces and even values from 10-2:
   ♣→♦, ♦→♣, ♠→♥, ♥→♠

2. Switch **odd card values** of colored suits (♥,♦) for their *complement values* to 10.
   Complement values: $1 \rightarrow 9$, $3 \rightarrow 7$, $5 \rightarrow 5$, $7 \rightarrow 3$, $9 \rightarrow 1$

Note: The first decoding rule cannot be applied after the second decoding rule made the card fit to work with the first rule!

5 Stacking the deck to the Mathematical tier

The following description takes you through the whole procedure of stacking the system according to the rules given for the Mathematical tier:

K♣ | Starting with the king of clubs, the **card value** of the subsequent card is obtained by adding the **suit value** of the current card to the **card value** of the current card. The **card value** of the king of clubs is **13**, its **suit value** equals **3**. Therefore, the **card value** of the next card is $13+3 = 16$. But **16** is an **out-of-range value**!

That's for the last rule:

If the **card value** is greater than **13**, subtract *multiples of 13* until an **in-range value** is obtained. **In-range values are:** 1, 2, 3 ,4, 5, 6, 7, 8, 9, 10, 11, 12 and 13.

Applying the rule results in $16-(1\times13) = \mathbf{3}$. That's the **card value** of the susequent card. Now, for the **suit value**: The next suit in **CHaSeD** order is **hearts**.

3♥ | **Remember:** The **card value** of the subsequent card is obtained by adding the **card value** of the current card to the **suit value** of the current card: $3+2 = \mathbf{5}$, that is. The **suit value** of the next card according to **CHaSeD** order is **spades**.

5♠ | **Now, things get clearer:** $5+1 = \mathbf{6}$ for the **card value** of the next card. Next suit in **CHaSeD** order is **diamonds**.

6♦ | $6+4 = \mathbf{10}$ for the **card value** of the next card. Next suit in **CHaSeD** order starts over with **clubs** for the first time.

T♣ | 10+3 = **13**. Next suit: **hearts**.

K♥ | 13+2 = **15**. That's an **out-of-range value**: 15−(1×13) = **2**. Next suit: **spades**.

2♠ | Simple: 2+1 = **3**. Next suit: **diamonds**.

3♦ | 3+4 = **7**. Next suit: **clubs**.

7♣ | 7+3 = **10**. Next suit: **hearts**.

T♥ | 10+2 = **12**. Next suit: **spades**.

Q♠ | 12+1 = **13**. Next suit: **diamonds**.

K♦ | 13+4 = **17**. Resolving **out-of-range value**: 17−(1×13) = **4**. Next suit: **clubs**.

4♣ | 4+3 = **7**. Next suit: **hearts**.

7♥ | 7+2 = **9**. Next suit: **spades**.

9♠ | 9+1 = **10**. Next suit: **diamonds**.

T♦ | 10+4 = **14**. **Out-of-range value** resolved: 14−(1×13) = **1** . Next suit: **clubs**.

A♣ | 1+3 = **4**. Next suit: **hearts**.

4♥ | 4+2 = **6**. Next suit: **spades**.

6♠ | 6+1 = **7**. Next suit: **diamonds**.

7♦ | 7+4 = **11**. Next suit: **clubs**.

J♣ | 11+3 = **14**. Resolving **out-of-range value**: 14−(1×13) = **1**. Next suit: **hearts**.

A♥ | 1+2 = **3**. Next suit: **spades**.

3♠ | 3+1 = **4**. Next suit: **diamonds**.

4♦ | 4+4 = **8**. Next suit: **clubs**.

8♣ | 8+3 = **11**. Next suit: **hearts**.

J♥ | 11+2 = **13**. Next suit: **spades**.

K♠ | 13+1 = **14**. 14−(1×13) = **1**. Next suit: **diamonds**.

A♦ | 1+4 = **5**. Next suit: **clubs**.

5♣ | 5+3 = **8**. Next suit: **hearts**.

8♥ | 8+2 = **10**. Next suit: **spades**.

T♠ | 10+1 = **11**. Next suit: **diamonds**.

J♦ | 11+4 = **15**. 15−(1×13) = **2**. Next suit: **clubs**.

2♣ | 2+3 = **5**. Next suit: **hearts**.

5♥ | 5+2 = **7**. Next suit: **spades**.

7♠ | 7+1 = **8**. Next suit: **diamonds**.

8♦ | 8+4 = **12**. Next suit: **clubs**.

Q♣ | 12+3 = **15**. 15−(1×13) = **2**. Next suit: **hearts**.

2♥ | 2+2 = **4**. Next suit: **spades**.

4♠ | 4+1 = **5**. Next suit: **diamonds**.

5♦ | 5+4 = **9**. Next suit: **clubs**.

9♣ | 9+3 = **12**. Next suit: **hearts**.

Q♥ | 12+2 = **14**. 14−(1×13) = **1**. Next suit: **spades**.

1♠ | 1+1 = **2**. Next suit: **diamonds**.

2♦ | 2+4 = **6**. Next suit: **clubs**.

6♣ | 6+3 = **9**. Next suit: **hearts**.

9♥ | 9+2 = **11**. Next suit: **spades**.

J♠ | 11+1 = **12**. Next suit: **diamonds**.

Q♦ | 12+4 = **16**. 16−(1×13) = **3**. Next suit: **clubs**.

3♣ | 3+3 = **6**. Next suit: **hearts**.

6♥ | 6+2 = **8**. Next suit: **spades**.

8♠ | 8+1 = **9**. Next suit: **diamonds**.

9♦ | 9+4 = **13**. Next suit: **clubs**.

That's the king of clubs, making the stack seamlessly connect to the first card.

The Elknase Card System is circular: Having the deck in this condition, you could cut it as many times as you liked and at any point, easily tell the top card by peeking at the bottom card.

6 Stacking the Elknase Card System

Now, that you learned to stack the Mathematical tier, you're ready for the next step. The following description takes you through the whole procedure of stacking the Elknase Card System.

Remember:

> **Always calculate in the Mathematical tier!**

Therefore, you calculate from the king of clubs!

K♦ | Again, we start with the king of clubs. But now we encode the *Mathematical tier* in order to arrive at the *Elknase Card System*. According to stated rules in **Encoding the Mathematical tier** on page 3, the king of clubs turns into the king of diamonds. Nevertheless, calculations always happen in the *Mathematical tier* ...

The **card value** of the subsequent card is obtained by adding the **suit value** of the current card to the **card value** of the current card. The **card value** of the king of clubs is **13**, its **suit value** equals **3**. Therefore, the **card value** of the next card is $13+3 = 16$. Reduced to an in-range value: $16-(1\times13) = \mathbf{3}$. Next suit according to **CHaSeD** order: **hearts**. Applying the encoding rules, the three of hearts becomes the seven of hearts.

7♥ | Calculating from the three of hearts, the next **card value** is: $3+2 = \mathbf{5}$. Next suit: **spades**. Applying the encoding rules, not much changes: The five of spades stays.

5♠ | Next card value: $5+1 = \mathbf{6}$. Next suit in **CHaSeD** order is **diamonds**. Applying encoding rules: Six of diamonds turns into six of clubs.

6♣ | Calculating from six of diamonds, the next card value is: $6+4 = \mathbf{10}$. Next suit: **Clubs**. Applying encoding rules: The ten of clubs turns ten of diamonds.

T♦ | Next card value: $10+3 = \mathbf{13}$. Next suit: **Hearts**. Encoded: King of hearts turns king of spades.

K♠ | Calculating from the king of hearts: $13+2 = 15$. Reduced to in-range value: $15-(1\times13) = \mathbf{2}$. Next suit: **Spades**. Encoded: Two of spades turns 2 of hearts.

2♥ | Calculating from the two of spades, the next card value is: $2+1 = \mathbf{3}$. Next suit: **Diamonds**. Encoded: Three of diamonds turns seven of diamonds.

7♦ | Calculating from the three of diamonds, the next card value is: $3+4 = \mathbf{7}$. Next suit: **Clubs**. Encoded: Nothing changes.

7♣ | Next card value: $7+3 = \mathbf{10}$. Next suit: **Hearts**. Encoded: The ten of hearts turns into the ten of spades.

T♠ | Calculating from the ten of hearts, the next card value: $10+2 = \mathbf{12}$. Next suit: **Spades**. Encoded: Queen of spades turns queen of hearts.

Q♥ | Calculating from the Queen of spades, the next card value is: $12+1 = \mathbf{13}$. Next suit: **Diamonds**. Encoded: The king of diamonds turns king of clubs.

K♣ | Calculating from the King of diamonds, the next card value is: $13+4 = \mathbf{17}$. Reduced to

in-range value: $17-(1\times13)$ = **4**. Next suit: **Clubs**. Encoded: The four of clubs turns into the four of diamonds.

4♦ | Calculating from the four of clubs, the next card value is: $4+3$ = **7**. Next suit: **Hearts**. Encoded: The seven of hearts turns into the three of hearts.

3♥ | Calculating from the seven of hearts, the next card value is: $7+2$ = **9**. Next suit: **Spades**. Encoded: Nothing changes.

9♠ | Next card value: $9+1$ = **10**. Next suit: **Diamonds**. Encoded: Ten of diamonds turns ten of clubs.

T♣ | Next card value: $10+4$ = 14. Reduced to in-range value: $14-(1\times13)$ = **1**. Next suit: **Clubs**. Encoded: The ace of clubs turns into the ace of diamonds. **But there's more:** The first encoding rule says, that odd card values shall be switched with their complement values. Recall the note given on page 3 which states, that: *The first encoding rule cannot be applied after the second encoding rule made the card fit to work with the first rule!*

A♦ | Calculating from the ace of clubs, the next card value is: $1+3$ = **4**. Next suit: **Hearts**. Encoded: The four of hearts turns to the four of spades.

4♠ | Calculating from the four of hearts, the next card value is: $4+2$ = **6**. Next suit: **Spades**. Encoded: The six of spades turns into the six of hearts.

6♥ | Calculating from the six of spades, the next card value is: $6+1$ = **7**. Next suit: **Diamonds**. Encoded: The seven of diamonds turns into the three of diamonds.

3♦ | Calculating from the seven of diamonds, the next card value is: $7+4$ = **11**. Next suit: **Clubs**. Encoded: The jack of clubs turns jack of diamonds.

J♦ | Calculating from the jack of clubs, the next card value is: $11+3$ = **14**. Reduced to in-range value: $14-(1\times13)$ = **1**. Next suit: **Hearts**. Encoded: The ace of hearts turns into the nine of hearts.

9♥ | Calculating from the ace of hearts, the next card value is: $1+2$ = **3**. Next suit: **Spades**. Encoded: The three of spades stays.

3♠ | Next card value: $3+1$ = 4. Next suit: **Diamonds**. Encoded: The four of diamonds turns into the four of clubs.

4♣ | Calculating from the four of diamonds, the next card value is: $4+4$ = **8**. Next suit: **Clubs**. Encoded: The eight of clubs turns into the eight of diamonds.

8♦ | Calculating from the eight of clubs, the next card value is: 8+3 = **11**. Next suit: **Hearts**. Encoded: The jack of hearts turns into the jack of spades.

J♠ | Calculating from the jack of hearts, the next card value is: 11+2 = **13**. Next suit: **Spades**. Encoded: The king of spades turns king of hearts.

K♥ | Calculating from the king of spades, the next card value is: 13+1 = **14**. Reduced to in-range value: 15−(1×13) = **1**. Next suit: **Diamonds**. Encoded: The ace of diamonds turns into the nine of diamonds.

9♦ | Calculating from the ace of diamonds, the next card value is: 1+4 = **5**. Next suit: **Clubs**. Encoded: Nothing changes.

5♣ | Next card value: 5+3 = 8. Next suit: **Hearts**. Encoded: The eight of hearts turns eight of spades.

8♠ | Calculating from the eight of hearts, the next card value is: 8+2 = **10**. Next suit: **Spades**. Encoded: Ten of spades turns ten of hearts.

T♥ | Calculating from the ten of spades, the next card value: 10+1 = 11. Next suit: **Diamonds**. Encoded: The jack of diamonds turns jack of clubs.

J♣ | Calculating from the jack of diamonds, the next card value is: 11+4 = 15. Reduced to in-range value: 15−(1×13) = **2**. Next suit: **Clubs**. Encoded: The two of clubs turns into the two of diamonds.

2♦ | Calculating from the two of clubs, the next card value is: 2+3 = **5**. Next suit: **Hearts**. Encoded: Nothing changes.

5♥ | Next card value: 5+2 = 7. Next suit: **Spades**. Encoded: Nothing changes.

7♠ | Next card value: 7+1 = 8. Next suit: **Diamonds**. Encoded: The eight of diamonds turns eight of clubs.

8♣ | Calculating from the eight of diamonds, the next card value is: 8+4 = **12**. Next suit: **Clubs**. Encoded: The queen of clubs turns queen of diamonds.

Q♦ | Calculating from the queen of clubs, the next card value is: 12+3 = **15**. Reduced to in-range value: 15−(1×13) = **2**. Next suit: **Hearts**. Encoded: The two of hearts turns into the

two of spades.

2♠ | Calculating from the two of hearts, the next card value is: 2+2 = **4**. Next suit: **Spades**. Encoded: The four of spades becomes the four of hearts.

4♥ | Calculating from the four of spades, the next card value is: 4+1 = **5**. Next suit: **Diamonds**. Encoded: The five of diamonds switches to its complement value. Still the five of diamonds!

5♦ | Next card value: 5+4 = 9. Next suit: **Clubs**. Encoded: Nothing changes.

9♣ | Next card value: 9+3 = 12. Next suit: **Hearts**. Encoded: The queen of hearts turns queen of spades.

Q♠ | Calculating from the queen of hearts, the next card value is: 12+2 = **14**. Reduced to in-range value: 14−(1×13) = **1**. Next suit: **Spades**. Encoded: The ace of spades turns into the ace of hearts.

A♥ | Calculating from the ace of spades, the next card value is: 1+1 = **2**. Next suit: **Diamonds**. Encoded: The two of diamonds turns into the two of clubs.

2♣ | Calculating from the two of diamonds, the next card value is: 2+4 = **6**. Next suit: **Clubs**. Encoded: The six of clubs turns into the six of diamonds.

6♦ | Calculating from the six of clubs, the next card value is: 6+3 = **9**. Next suit: **Hearts**. Encoded: The nine of hearts turns into the ace of hearts and the ace of hearts turns into the ace of spades!

A♠ | Calculating from the nine of hearts, the next card value is: 9+2 = **11**. Next suit: **Spades**. Encoded: The jack of spades turns into the jack of hearts.

J♥ | Calculating from the jack of spades, the next card value is: 11+1 = **12**. Next suit: **Diamonds**. Encoded: The queen of diamonds becomes queen of clubs.

Q♣ | Calculating from the queen of diamonds, the next card value is: 12+4 = **16**. Reduced to in-range value: 16−(1×13) = **3**. Next suit: **Clubs**. Encoded: Nothing changes.

3♣ | Next card value: 3+3 = 6. Next suit: **Hearts**. Encoded: The six of hearts turns into the six of spades.

6♠ | Calculating from the six of hearts, the next card value is: 6+2 = **8**. Next suit: **Spades**. Encoded: The eight of spades turns into the eight of hearts.

8♥ | Calculating from the eight of spades, the next card value is: 8+1 = **9**. Next suit: **Diamonds**. Encoded: The nine of diamonds turns into the ace of diamonds. The ace of diamonds turns into the ace of clubs.

A♣ | Calculating from the nine of diamonds, the next card value is: 9+4 = **13**. Next suit: **Clubs**. Encoded: The king of clubs turns into the king of diamonds and you made a seamless connection to the first card in the *Elknase Card System*!

7 Basic Applications

7.1 Shuffling/Cutting

You obviously need to maintain full deck order to have the *Elknase Card System* work for you. Nevertheless, fast subsequent cuts could mime a legitimate shuffle. Any full deck false shuffle like the *Heinstein shuffle* or any form of an continuous *up-the-letter cut* might make it look even more convincing. Let the spectators single-cut the deck as many times they like. As long as you maintain the circular order of the system, anything goes!

7.2 Calculating the top card

Given you know the bottom card, calculating the top card requires three steps:

1. Decode the bottom card
2. Calculate the next card in the *Mathematical tier*
3. Encode the result

8 Elknase Card System Features II

Important: The following rules *only* work in the *Mathematical tier*.

8.1 Shortcut rule I

The $\mathbf{4n^{th}}$ card from top equals bottom card value less $\mathbf{3n}$, same suit.
Note: If the bottom card value is smaller than the value to be subtracted ($\mathbf{3n}$), add 13 to the minuend!

Well, what does it mean? Let me give you an example: Suppose you know the bottom card and further want to find out about the 8th card from top. Therefore, the 8th card from top equals $\mathbf{4n}$ in the equation, right? So we can say $\mathbf{4n = 8}$! And if we subtract $\mathbf{3n}$ from the bottom card value, we obtain the value of the card being 8th from top! But first of all, we need to resolve the value of $\mathbf{4n}$! (By the way, $\mathbf{4n}$ is arithmetic writing for $\mathbf{4 \times n}$) As we already know: $\mathbf{4 \times n = 8}$. So, what's $\mathbf{n}$? $8 \div 4 = \mathbf{n}$. Therefore, $\mathbf{n = 2}$. But we need to subtract $\mathbf{3n}$ from the bottom card value. Simple enough: $\mathbf{3n = 3 \times 2 = 6}$. The 8th card from top equals bottom card value less six!

This rule works with all card positions divisible by four. So, you easily could calculate the 4th, 8th, 12th, 16th etc. card from top!

8.1.1 Examples

Given the bottom card is ...

K♠| ... and you need to know the 4th card from top. First of all, you need to decode the card according to the rules in **Decoding the Mathematical tier** on page 4. The king of spades turns into king of hearts. Now, you already know that the suit of the the 4th card from top is **hearts**! Now, let's calculate the card value: The 4th card from top equals $\mathbf{13 - 3n}$, whereas $\mathbf{4n = 4}$ (the 4th card from top). Resolve $\mathbf{n}$, subtract $\mathbf{3 \times n}$, encode and your done! $\mathbf{n} = 4 \div 4 = \mathbf{1}$. $13 - (3 \times 1) = \mathbf{10}$. That's the ten of hearts in the *Mathematical tier*. Encoding according to the rules given in **Encoding the Mathematical tier** on page 3 has no effect. **The result:** The 4th card from top is the ten of hearts!

Let us try the 8th card from top under the same conditions: King of spades decoded turns into the king of hearts. The 8th card from top equals $\mathbf{13 - 3n}$, whereas $\mathbf{4n = 8}$ (the 8th card from top). Remember: Resolve $\mathbf{n}$, subtract $\mathbf{3n}$, encode and your done! $\mathbf{n} = 8 \div 4 = \mathbf{2}$. $13 - (3 \times 2) = \mathbf{7}$. That's the seven of hearts in the *Mathematical tier*. Encode and your done: The seven of hearts turns into the three of hearts. **Result:** The 8th card from top is the three of hearts!

Now, let's try a difficult one with the bottom card being ...

4♠| What's the 12th card from top? First of all, you need to decode the card: the four of spades turns into the four of hearts. So the suit of the card in the *Mathematical tier* is **hearts**. The 12th card from top equals $\mathbf{4 - 3n}$, whereas $\mathbf{4n = 12}$ (the 12th card from top). Resolve: $\mathbf{n} = 12 \div 4 = \mathbf{3}$. But $4 - (3 \times 3) = \mathbf{-5}$! Now, the rule says that *if the bottom card value is smaller than the value to be subtracted, add 13!* That's what we do: We simply add $13 + 4$ and arrive at $17 - (3 \times 3) = \mathbf{8}$. That's the eight of hearts in the *Mathematical tier*. Encode: The eight of hearts turns into the eight of spades. **Result:** the 12th card from top is the eight of spades!

8.2 Shortcut rule II

> The $\mathbf{16^{th}}$ card from top equals bottom card value $+\mathbf{1}$, same suit.

8.3 Shortcut rule III

> The $\mathbf{36^{th}}$ card from top equals bottom card value $-\mathbf{1}$, same suit.

9 Advanced Applications

9.1 Calculating positions I

9.2 Calculating positions II

10 Thanks

Many thanks go to Swiss professional Magician *Roberto Giobbi*. With his help I could fine-tune some points and make the system what it is today. Thanks also goes to *Si Stebbins*, for all the inspiration he gave me with his stack. Thanks to *Edward Stoddard* for his wonderful Japanese soroban theory, which was the key inspiration to the value complements of the coding system.

11 Terms Of Use

The *Elknase Card System* is freeware and may be modifyed to fit individual needs. I wish you plenty of great performances with happy and astonished spectators. Please send me an email to info@elknase.com and let me know if you like the system. Ideas, corrections and inspirations are always welcome. Enjoy and have fun!