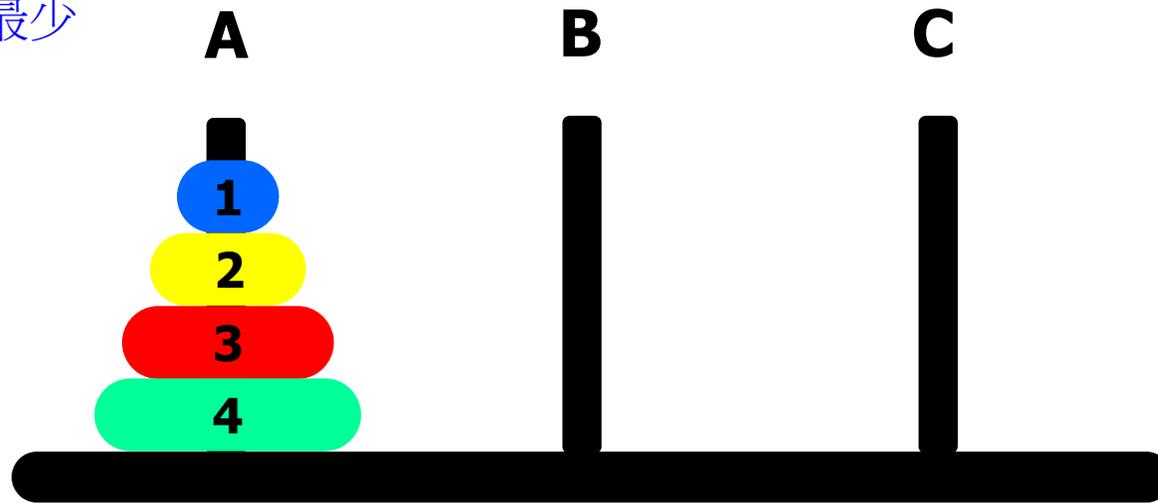


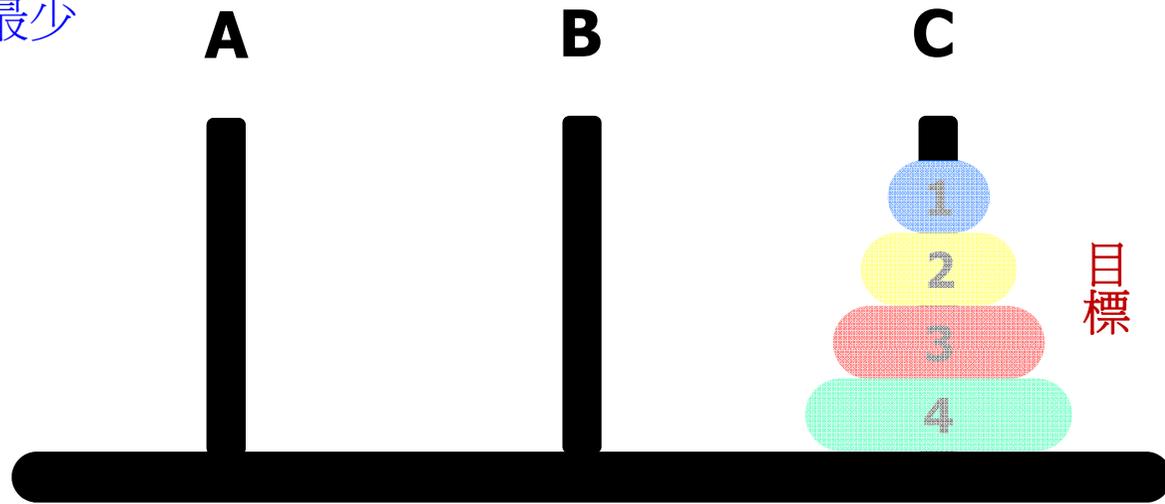
# 河內塔

要求: 移動次數最少



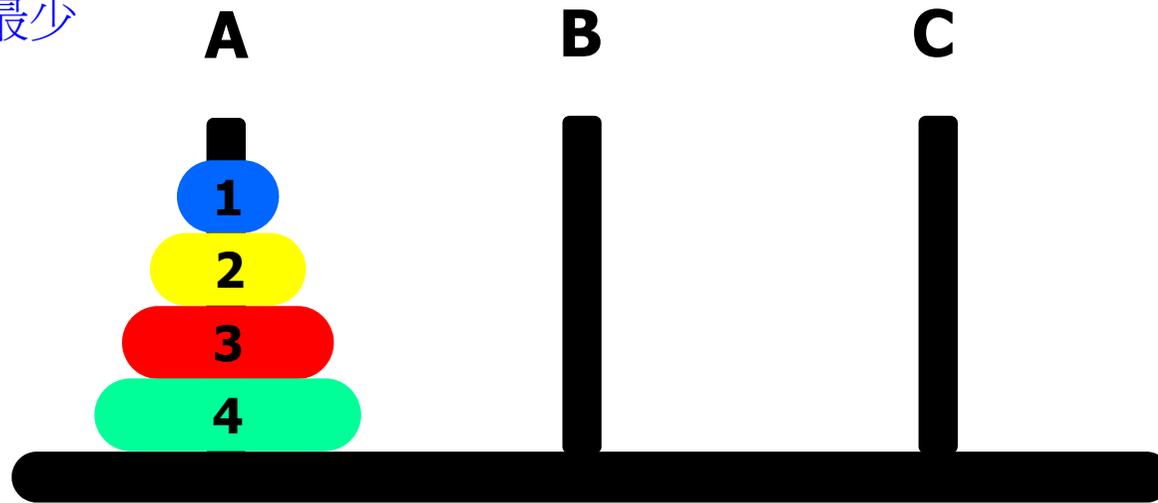
# 河內塔

要求: 移動次數最少



# 河內塔

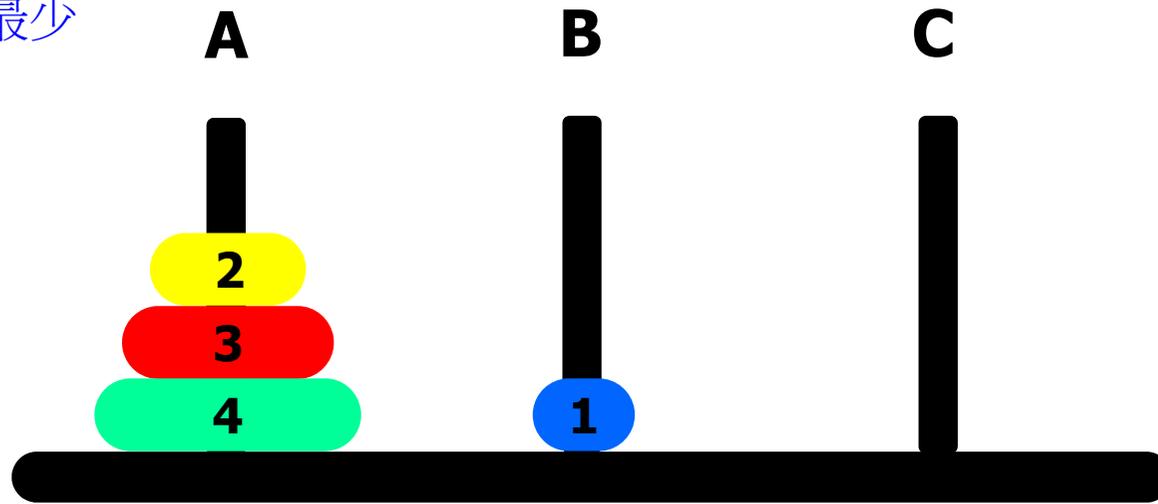
要求: 移動次數最少



程式輸出

# 河內塔

要求: 移動次數最少

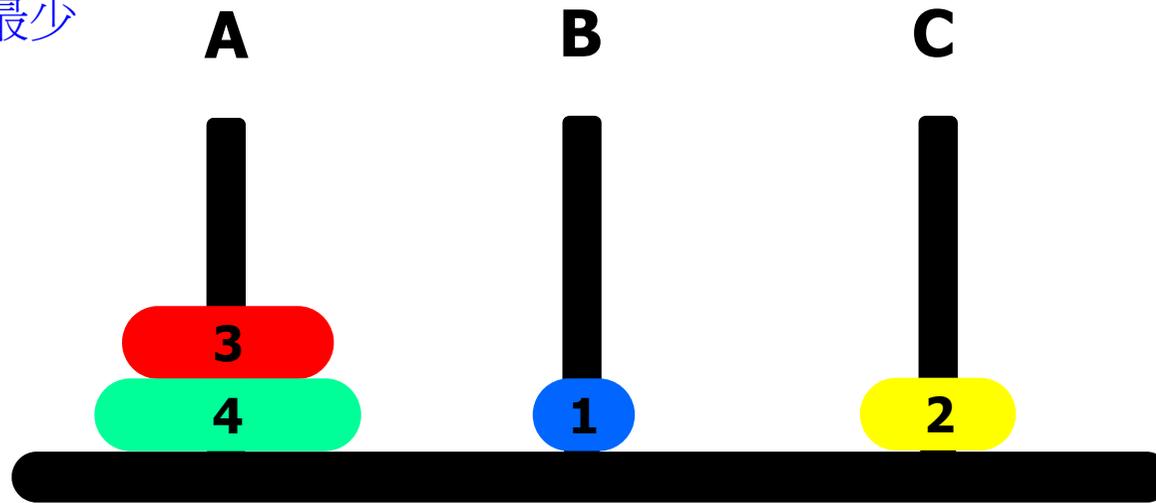


程式輸出

**1, A -> B**

# 河內塔

要求: 移動次數最少



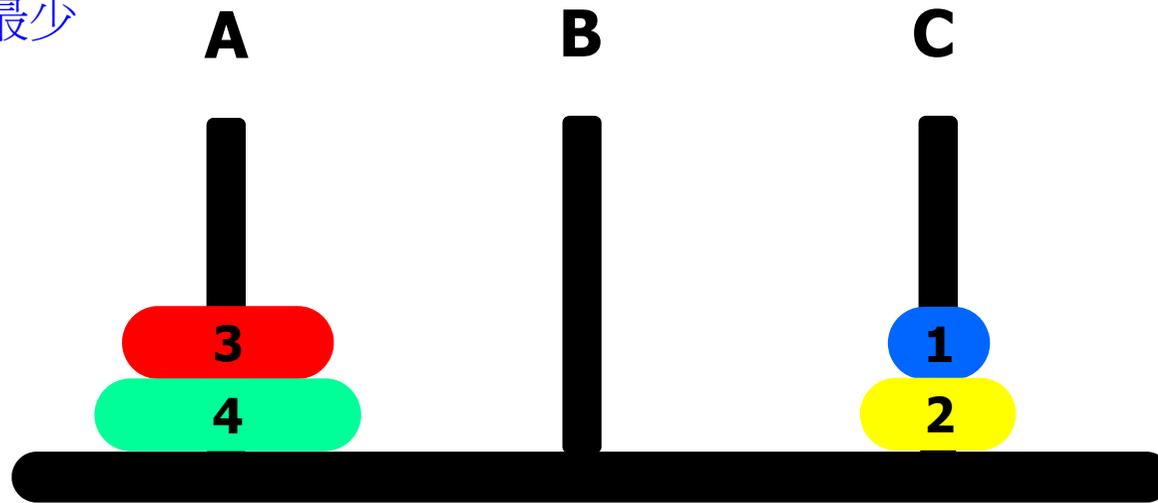
程式輸出

1, A -> B

2, A -> C

# 河內塔

要求: 移動次數最少



程式輸出

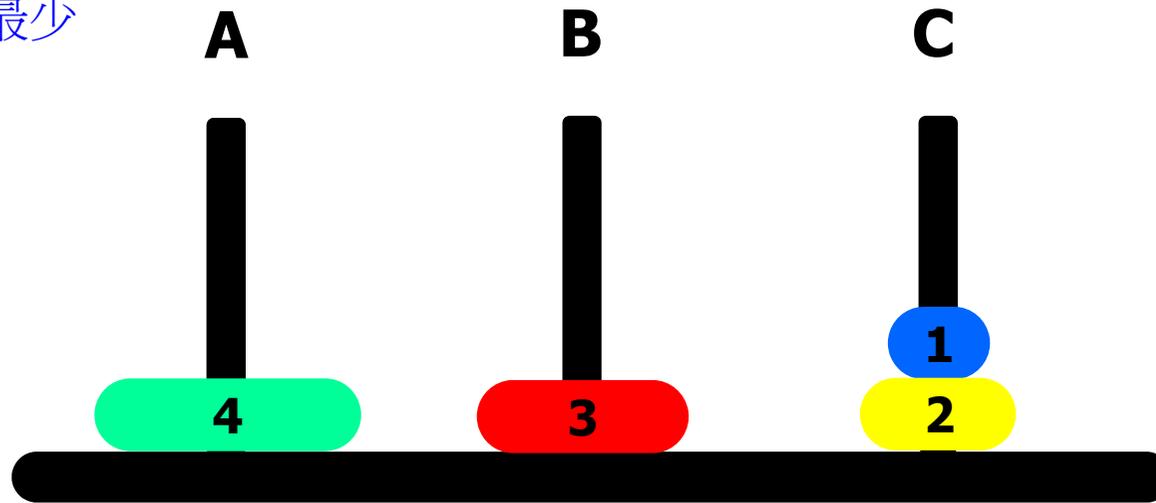
**1, A -> B**

**2, A -> C**

**1, B -> C**

# 河內塔

要求: 移動次數最少



程式輸出

**1, A -> B**

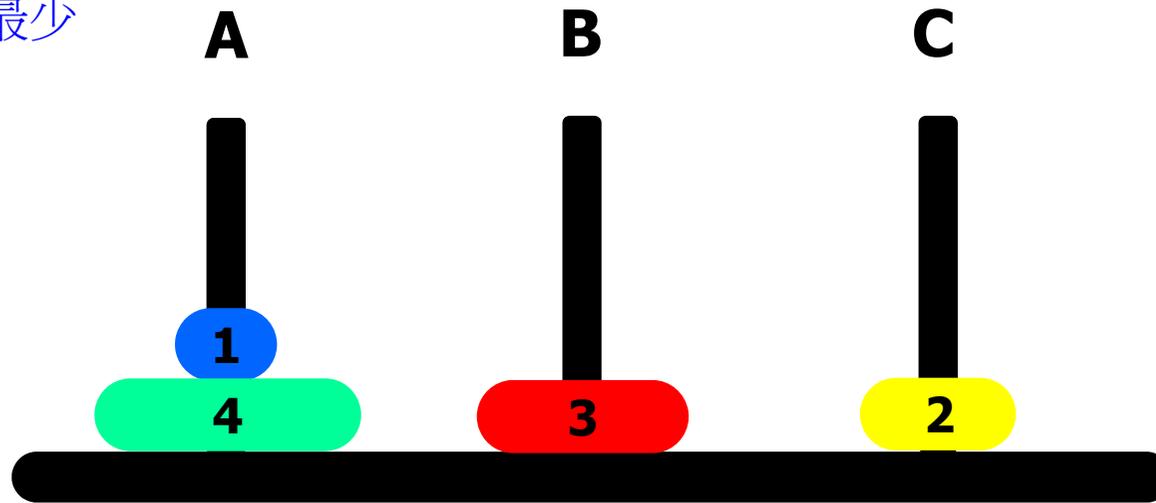
**2, A -> C**

**1, B -> C**

**3, A -> B**

# 河內塔

要求: 移動次數最少

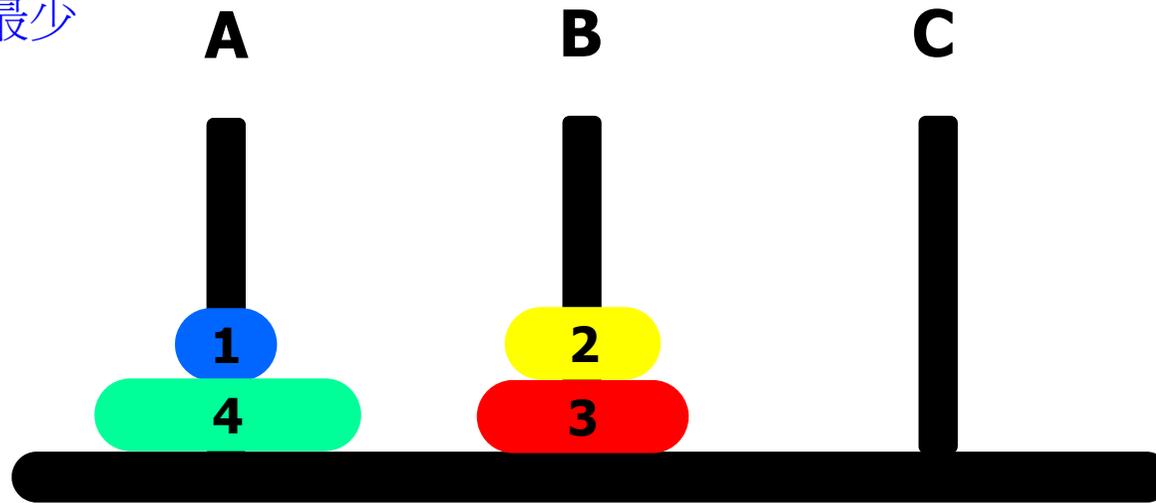


程式輸出

**1, A -> B    1, C -> A**  
**2, A -> C**  
**1, B -> C**  
**3, A -> B**

# 河內塔

要求: 移動次數最少

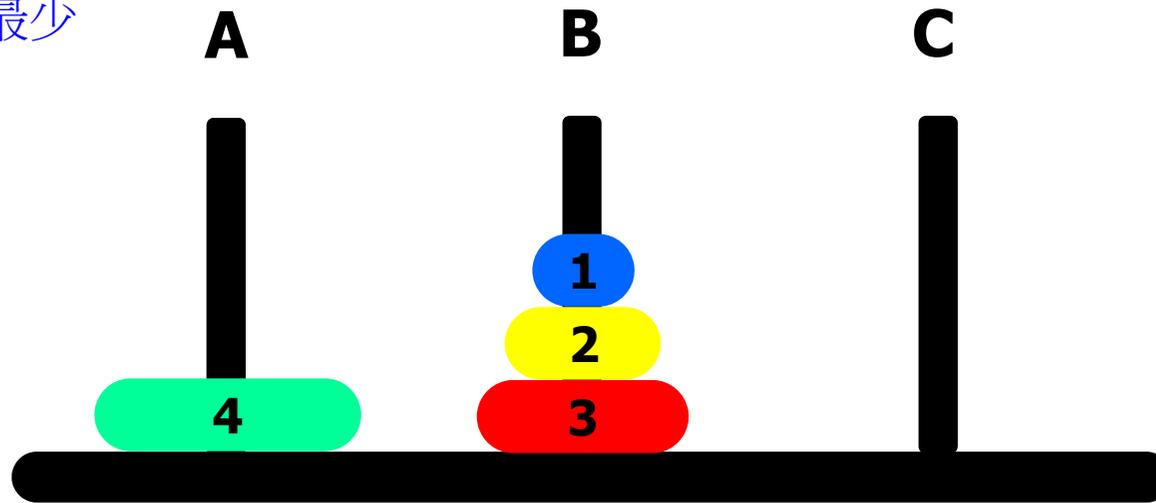


程式輸出

**1, A -> B**      **1, C -> A**  
**2, A -> C**      **2, C -> B**  
**1, B -> C**  
**3, A -> B**

# 河內塔

要求: 移動次數最少

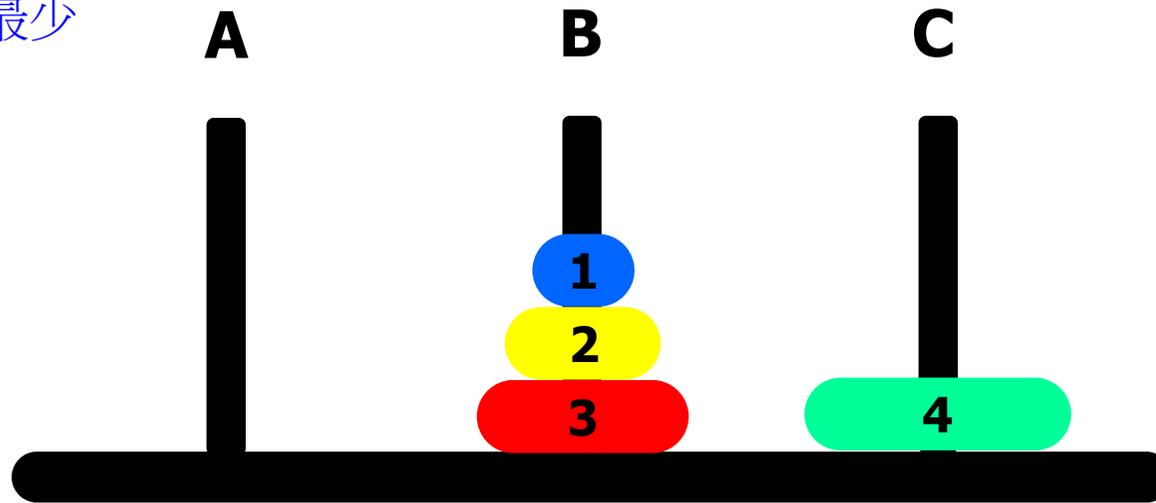


程式輸出

<b>1, A -&gt; B</b>	<b>1, C -&gt; A</b>
<b>2, A -&gt; C</b>	<b>2, C -&gt; B</b>
<b>1, B -&gt; C</b>	<b>1, A -&gt; B</b>
<b>3, A -&gt; B</b>	

# 河內塔

要求: 移動次數最少

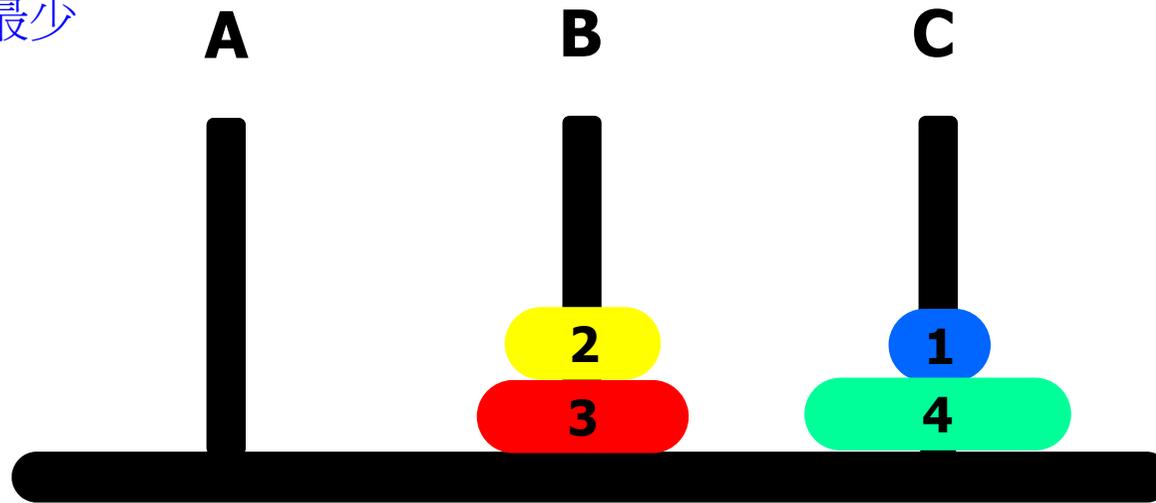


程式輸出

<b>1, A -&gt; B</b>	<b>1, C -&gt; A</b>
<b>2, A -&gt; C</b>	<b>2, C -&gt; B</b>
<b>1, B -&gt; C</b>	<b>1, A -&gt; B</b>
<b>3, A -&gt; B</b>	<b>4, A -&gt; C</b>

# 河內塔

要求: 移動次數最少

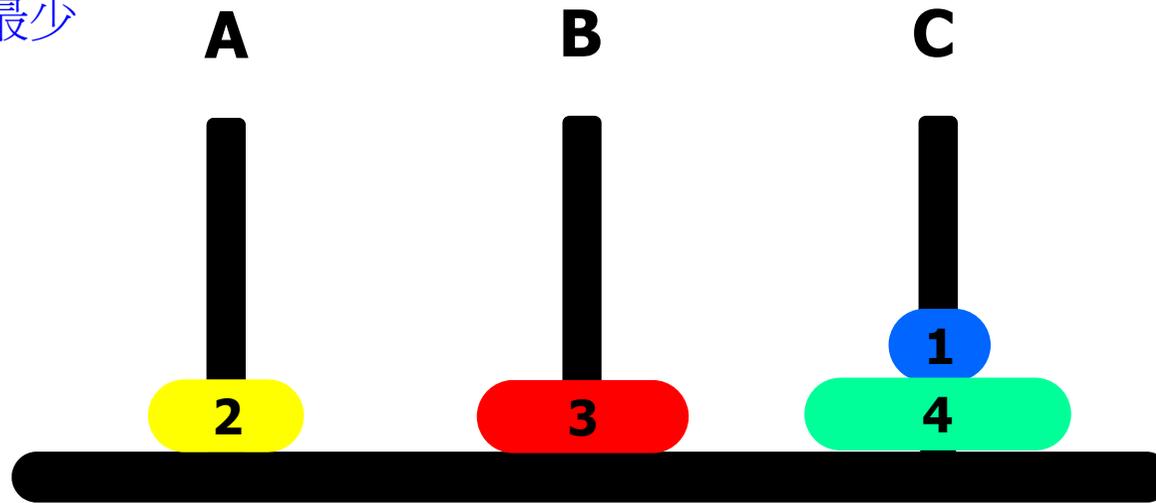


程式輸出

<b>1, A -&gt; B</b>	<b>1, C -&gt; A</b>	<b>1, B -&gt; C</b>
<b>2, A -&gt; C</b>	<b>2, C -&gt; B</b>	
<b>1, B -&gt; C</b>	<b>1, A -&gt; B</b>	
<b>3, A -&gt; B</b>	<b>4, A -&gt; C</b>	

# 河內塔

要求: 移動次數最少

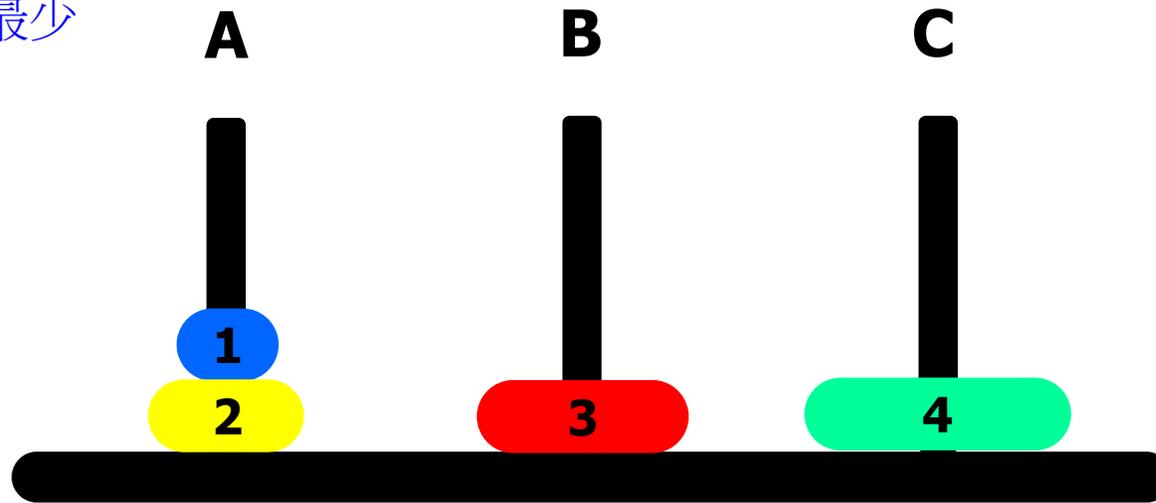


程式輸出

1, A -> B	1, C -> A	1, B -> C
2, A -> C	2, C -> B	2, B -> A
1, B -> C	1, A -> B	
3, A -> B	4, A -> C	

# 河內塔

要求: 移動次數最少

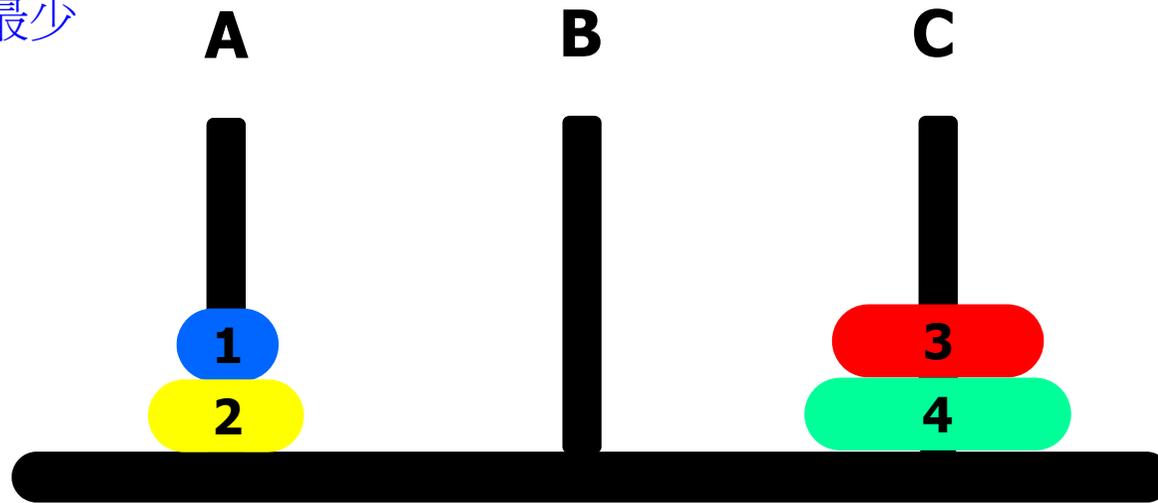


程式輸出

1, A -> B	1, C -> A	1, B -> C
2, A -> C	2, C -> B	2, B -> A
1, B -> C	1, A -> B	1, C -> A
3, A -> B	4, A -> C	

# 河內塔

要求: 移動次數最少

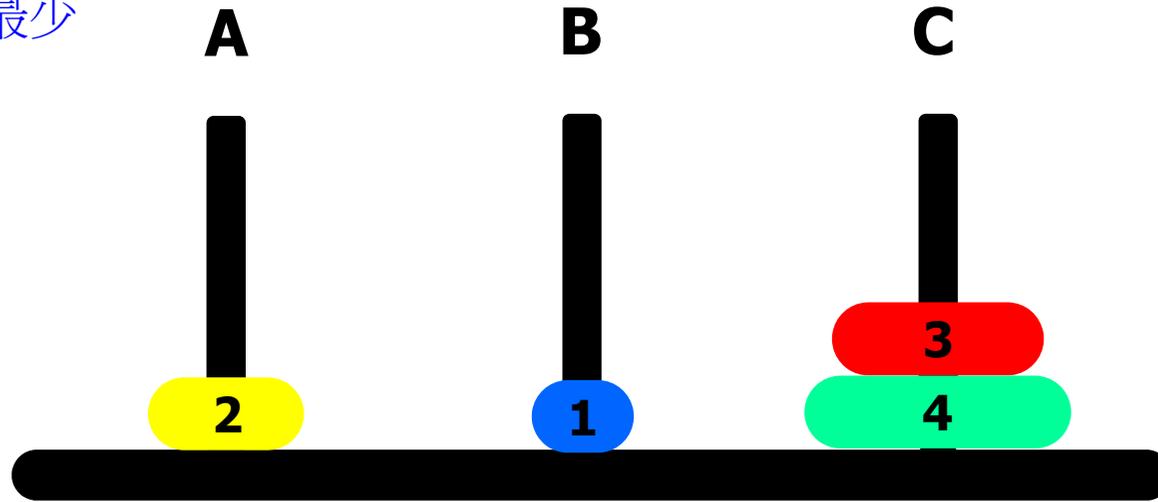


程式輸出

<b>1, A -&gt; B</b>	<b>1, C -&gt; A</b>	<b>1, B -&gt; C</b>
<b>2, A -&gt; C</b>	<b>2, C -&gt; B</b>	<b>2, B -&gt; A</b>
<b>1, B -&gt; C</b>	<b>1, A -&gt; B</b>	<b>1, C -&gt; A</b>
<b>3, A -&gt; B</b>	<b>4, A -&gt; C</b>	<b>3, B -&gt; C</b>

# 河內塔

要求: 移動次數最少

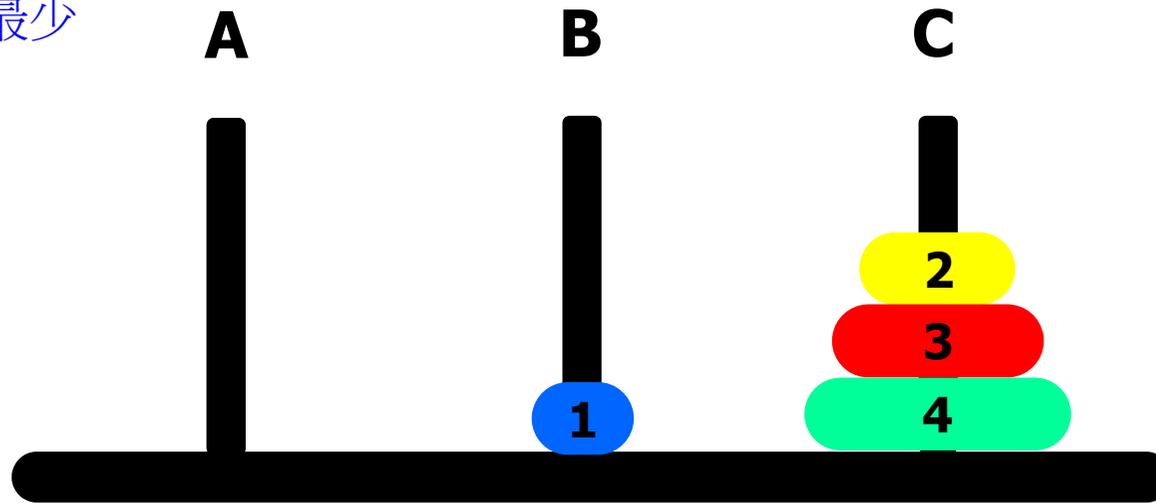


程式輸出

<b>1, A -&gt; B</b>	<b>1, C -&gt; A</b>	<b>1, B -&gt; C</b>	<b>1, A -&gt; B</b>
<b>2, A -&gt; C</b>	<b>2, C -&gt; B</b>	<b>2, B -&gt; A</b>	
<b>1, B -&gt; C</b>	<b>1, A -&gt; B</b>	<b>1, C -&gt; A</b>	
<b>3, A -&gt; B</b>	<b>4, A -&gt; C</b>	<b>3, B -&gt; C</b>	

# 河內塔

要求: 移動次數最少

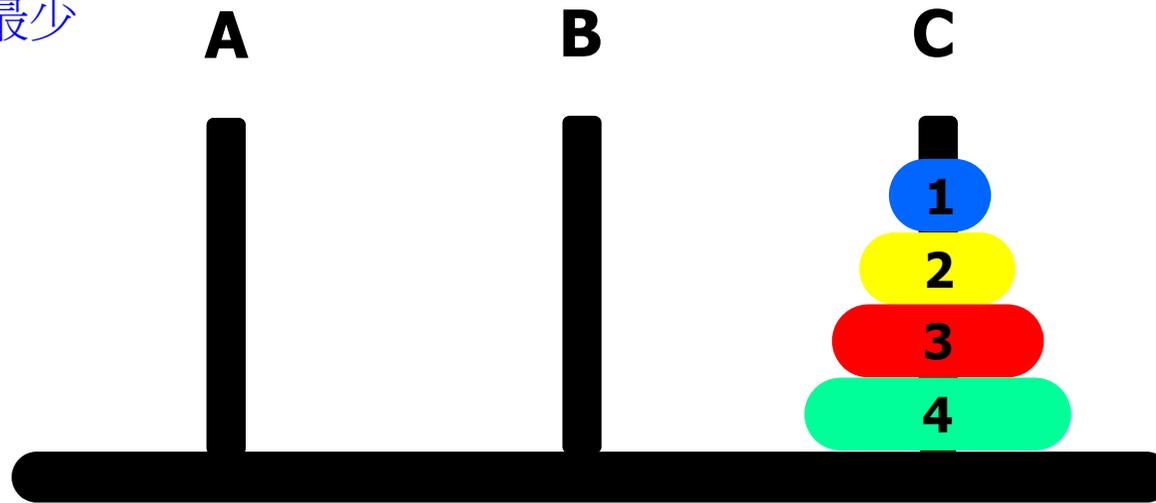


程式輸出

<b>1, A -&gt; B</b>	<b>1, C -&gt; A</b>	<b>1, B -&gt; C</b>	<b>1, A -&gt; B</b>
<b>2, A -&gt; C</b>	<b>2, C -&gt; B</b>	<b>2, B -&gt; A</b>	<b>2, A -&gt; C</b>
<b>1, B -&gt; C</b>	<b>1, A -&gt; B</b>	<b>1, C -&gt; A</b>	
<b>3, A -&gt; B</b>	<b>4, A -&gt; C</b>	<b>3, B -&gt; C</b>	

# 河內塔

要求: 移動次數最少



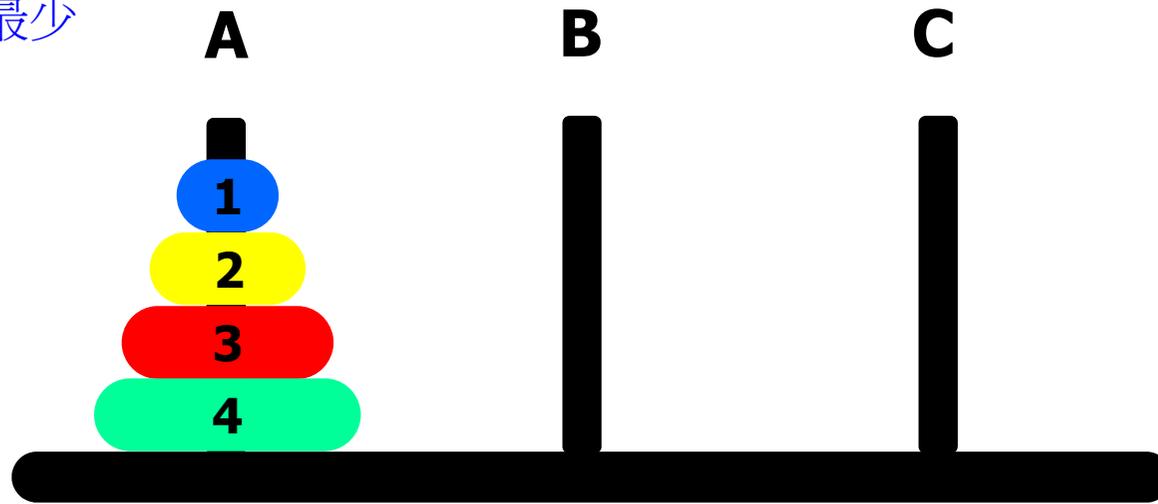
程式輸出

<b>1, A -&gt; B</b>	<b>1, C -&gt; A</b>	<b>1, B -&gt; C</b>	<b>1, A -&gt; B</b>
<b>2, A -&gt; C</b>	<b>2, C -&gt; B</b>	<b>2, B -&gt; A</b>	<b>2, A -&gt; C</b>
<b>1, B -&gt; C</b>	<b>1, A -&gt; B</b>	<b>1, C -&gt; A</b>	<b>1, B -&gt; C</b>
<b>3, A -&gt; B</b>	<b>4, A -&gt; C</b>	<b>3, B -&gt; C</b>	

**2<sup>4</sup>-1**

# 河內塔

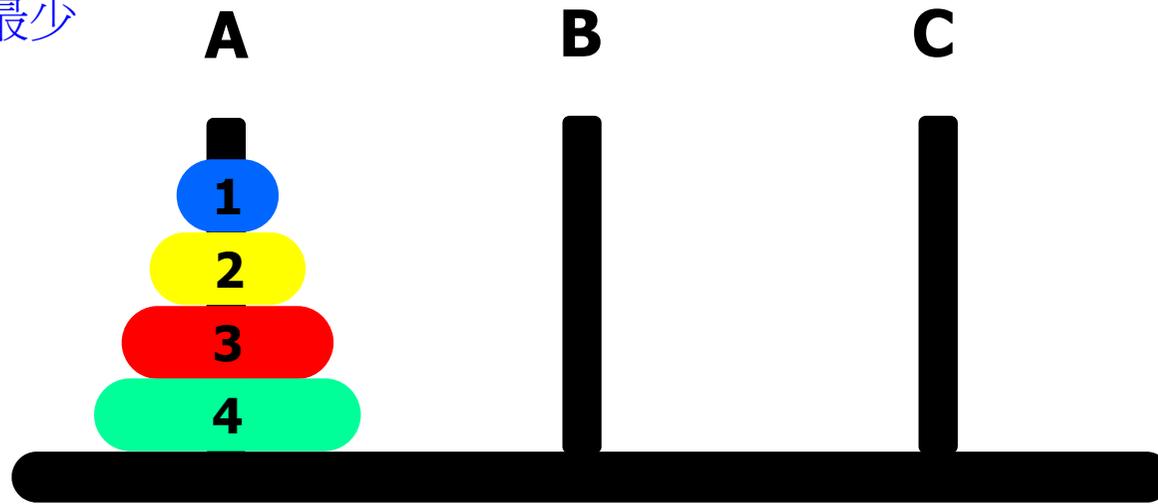
要求: 移動次數最少



思考方法

# 河內塔

要求: 移動次數最少

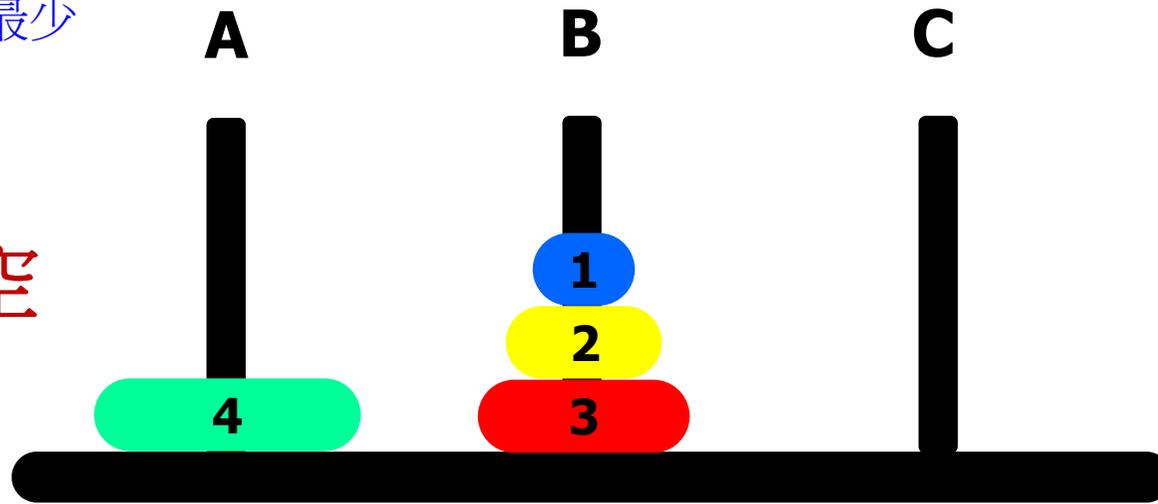


思考方法

# 河內塔

要求: 移動次數最少

淨空



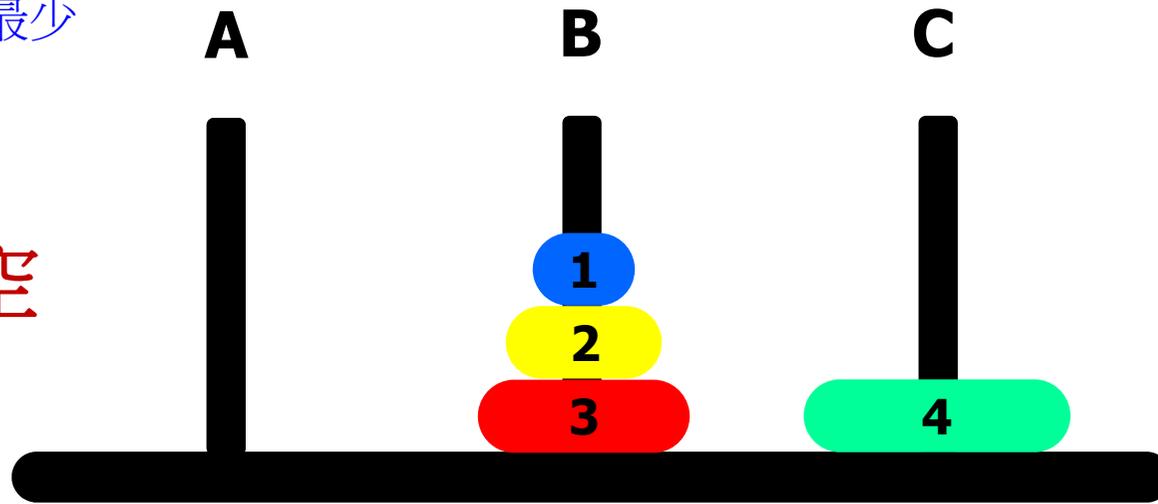
思考方法

$$(2^3-1)$$

# 河內塔

要求: 移動次數最少

淨空



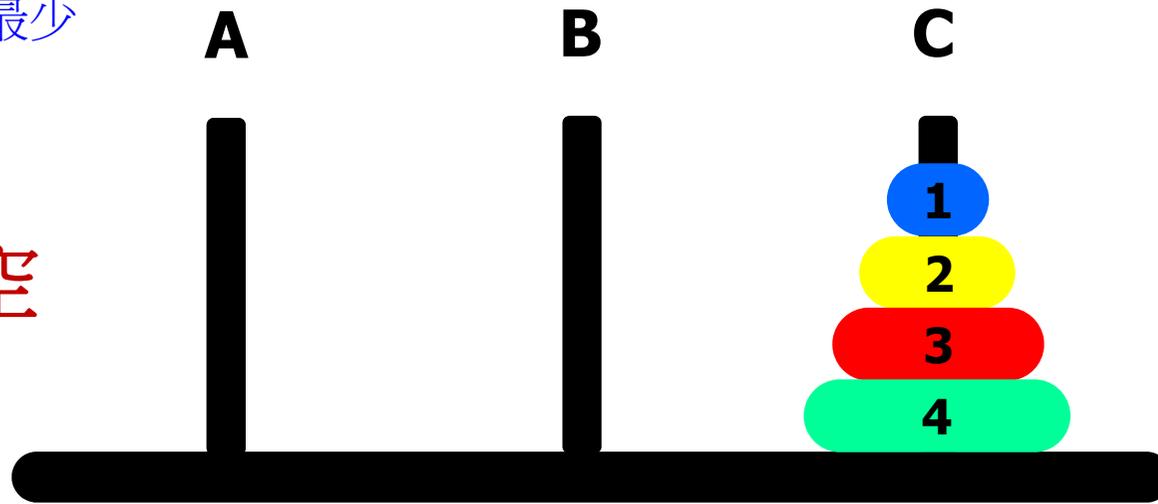
思考方法

$$(2^3 - 1) + 1$$

# 河內塔

要求: 移動次數最少

淨空

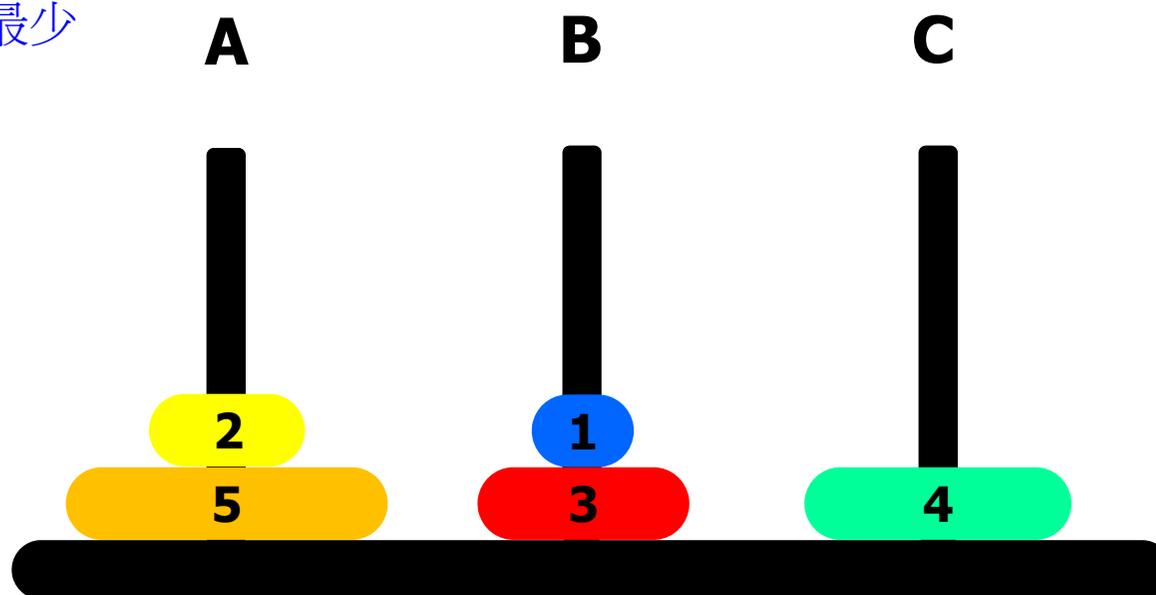


思考方法

$$(2^3-1) + 1 + (2^3-1) = 2^4-1$$

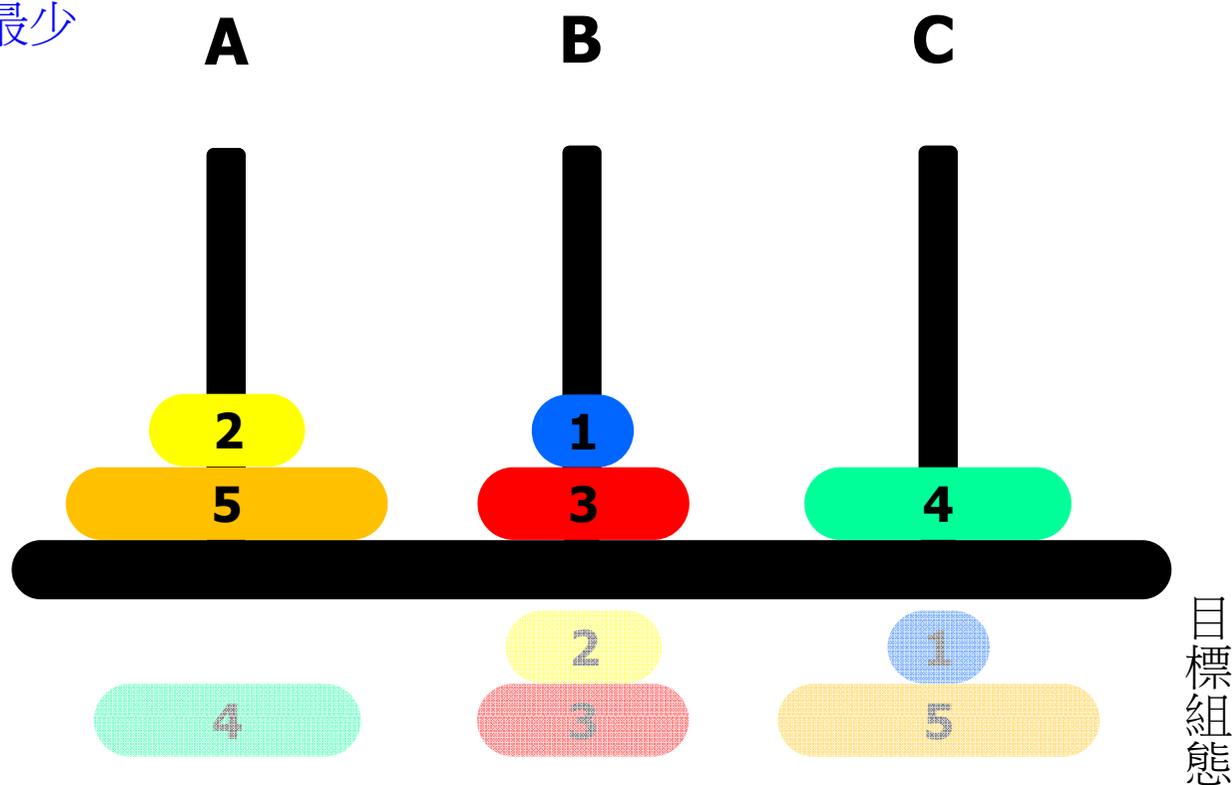
# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



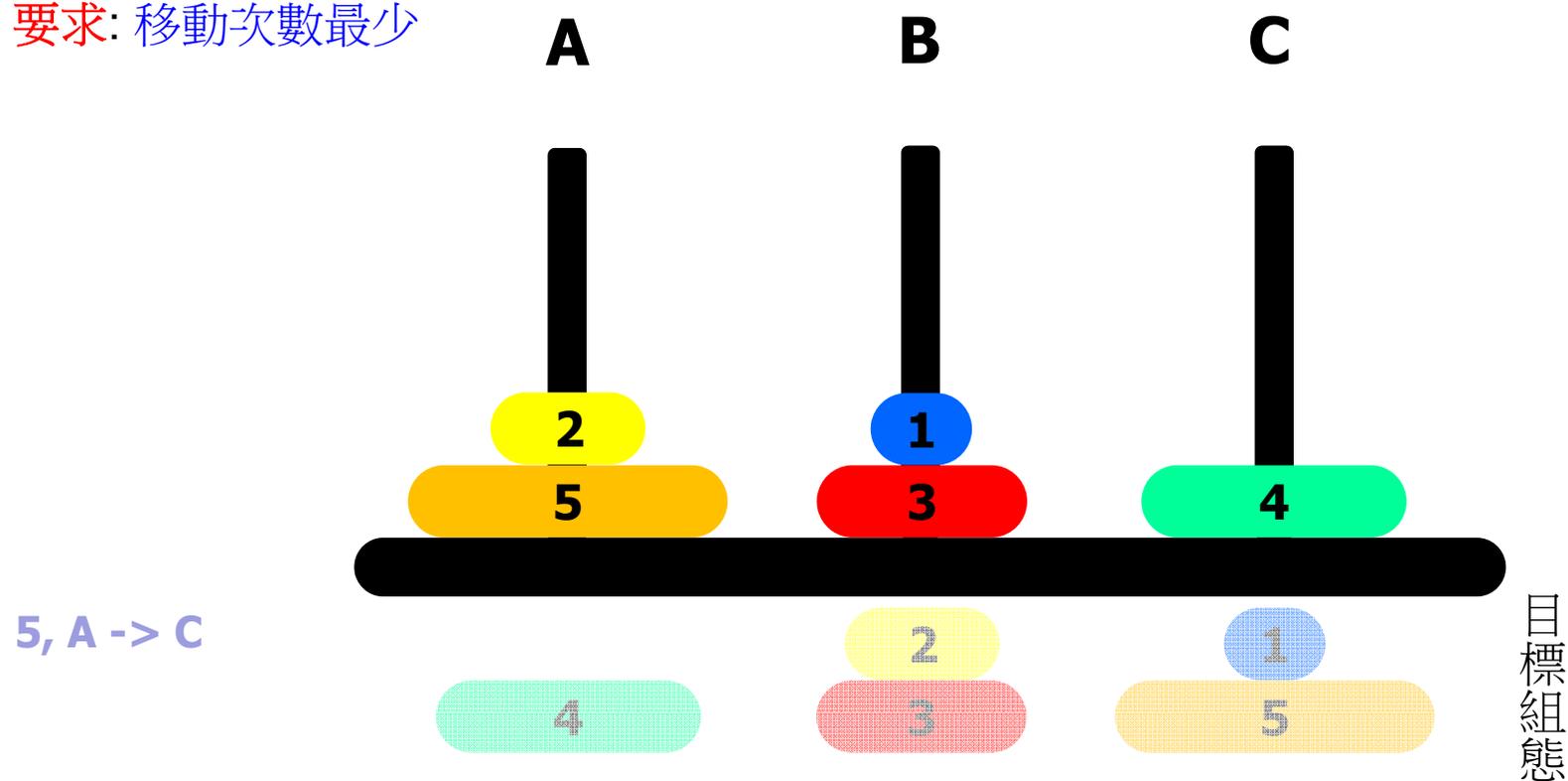
# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



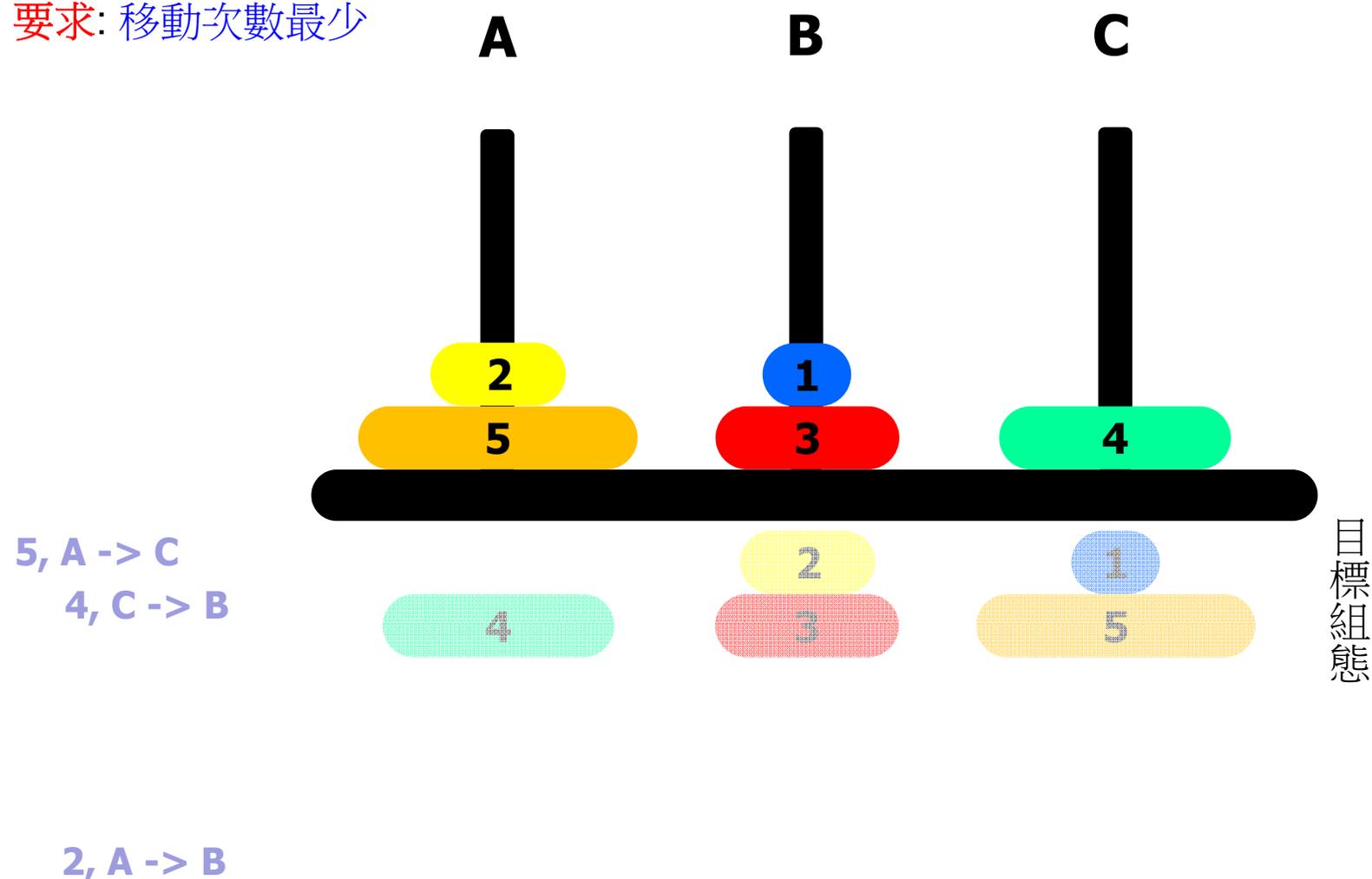
# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



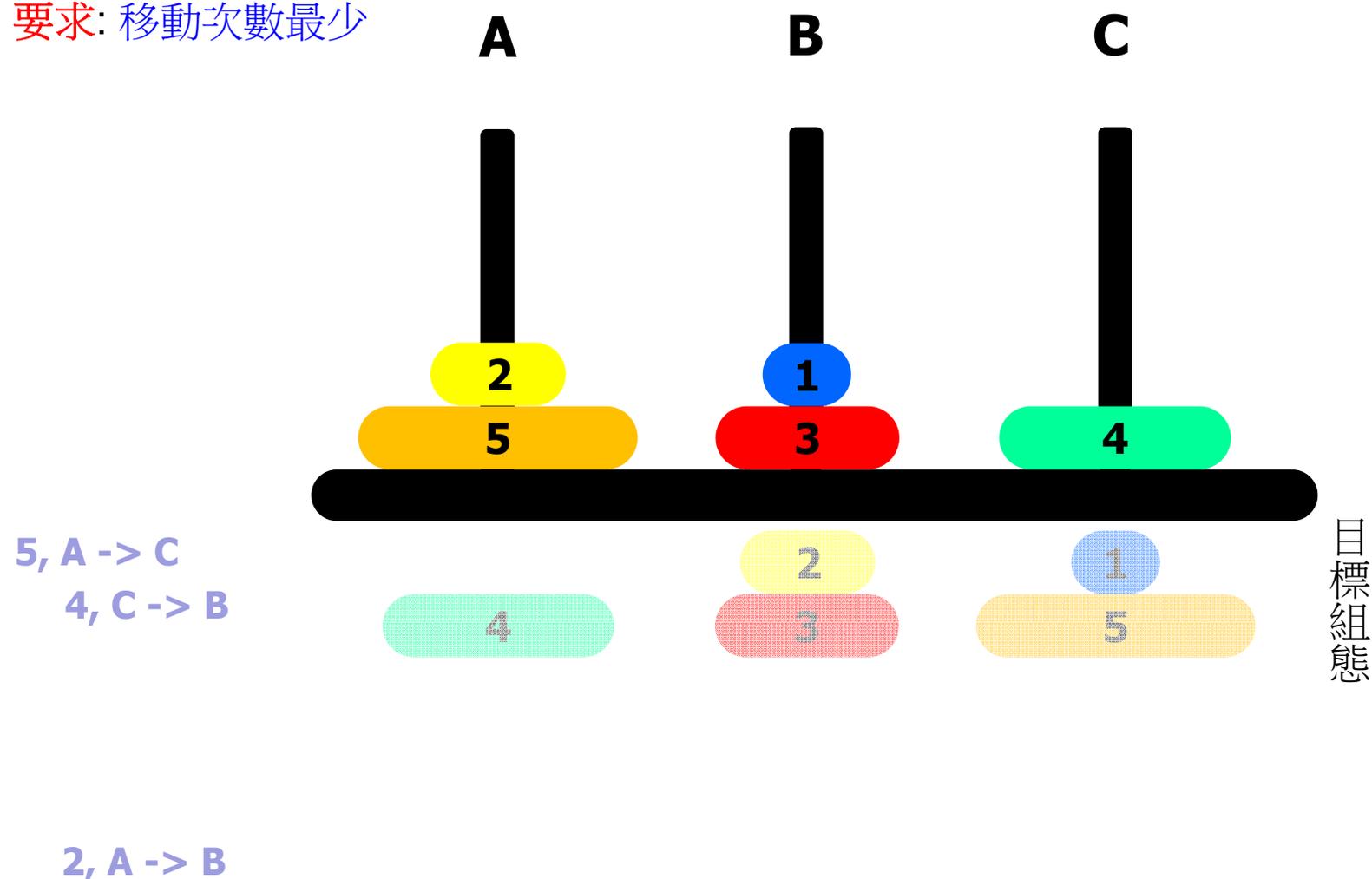
# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



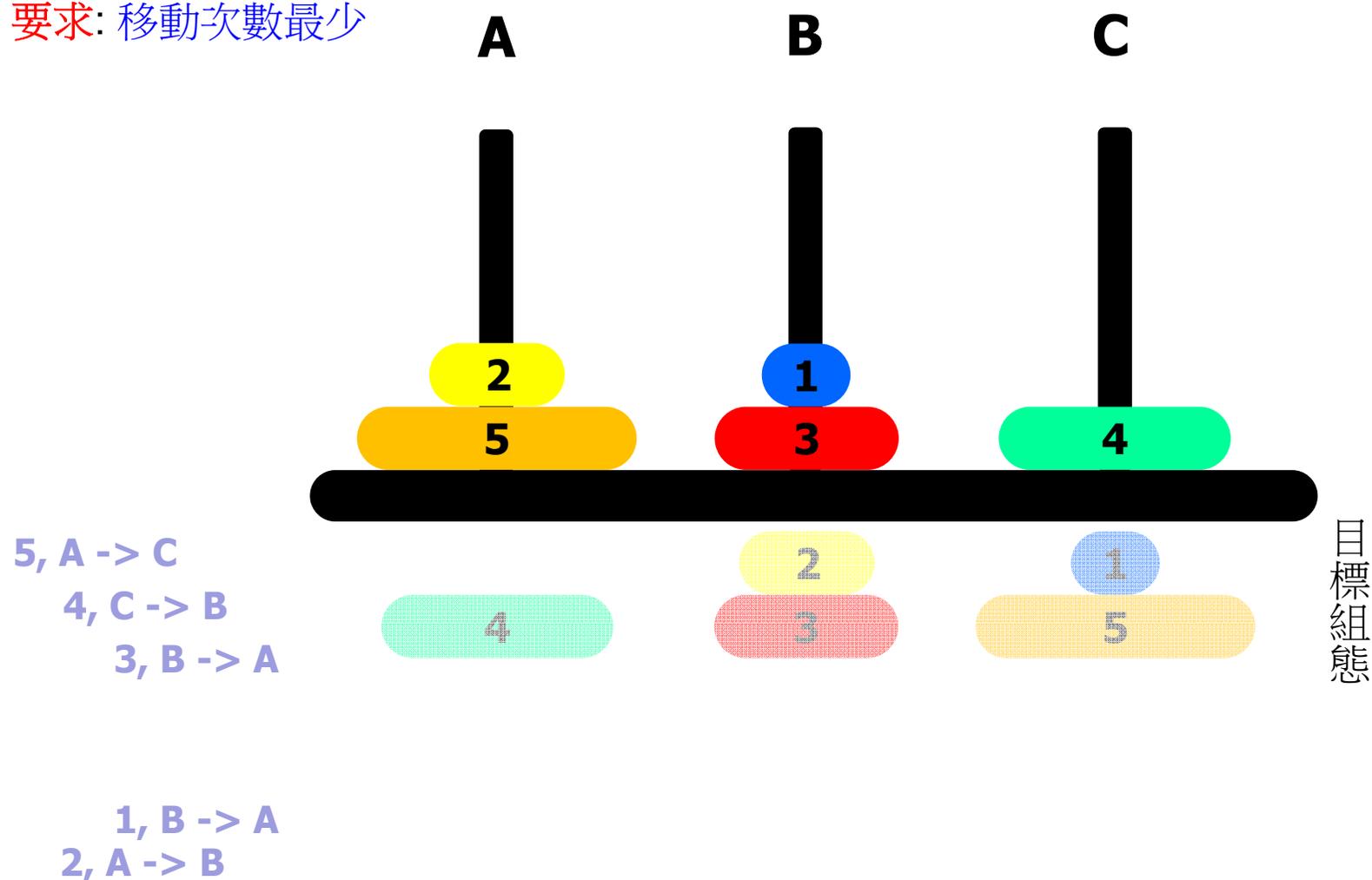
# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



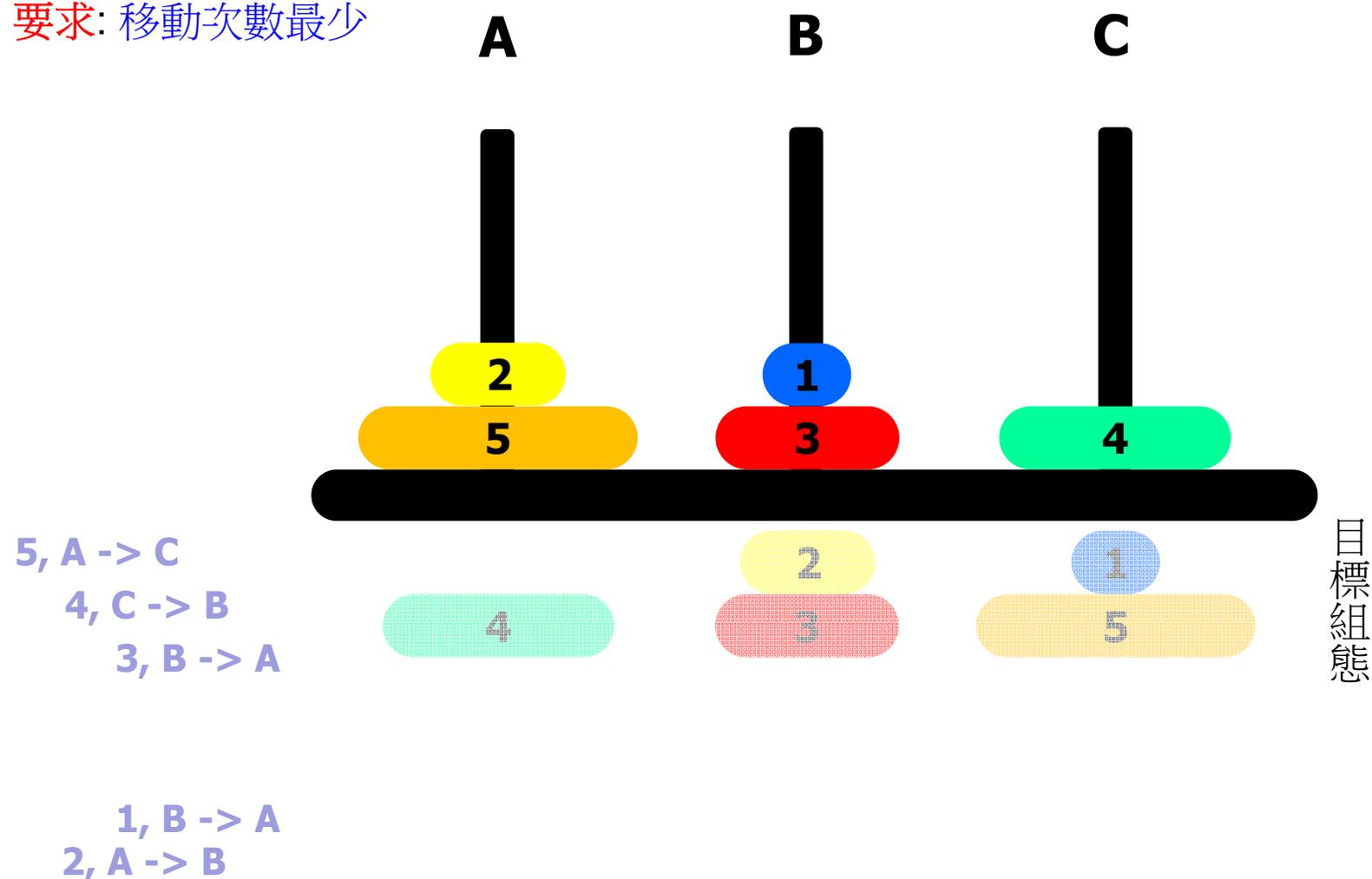
# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



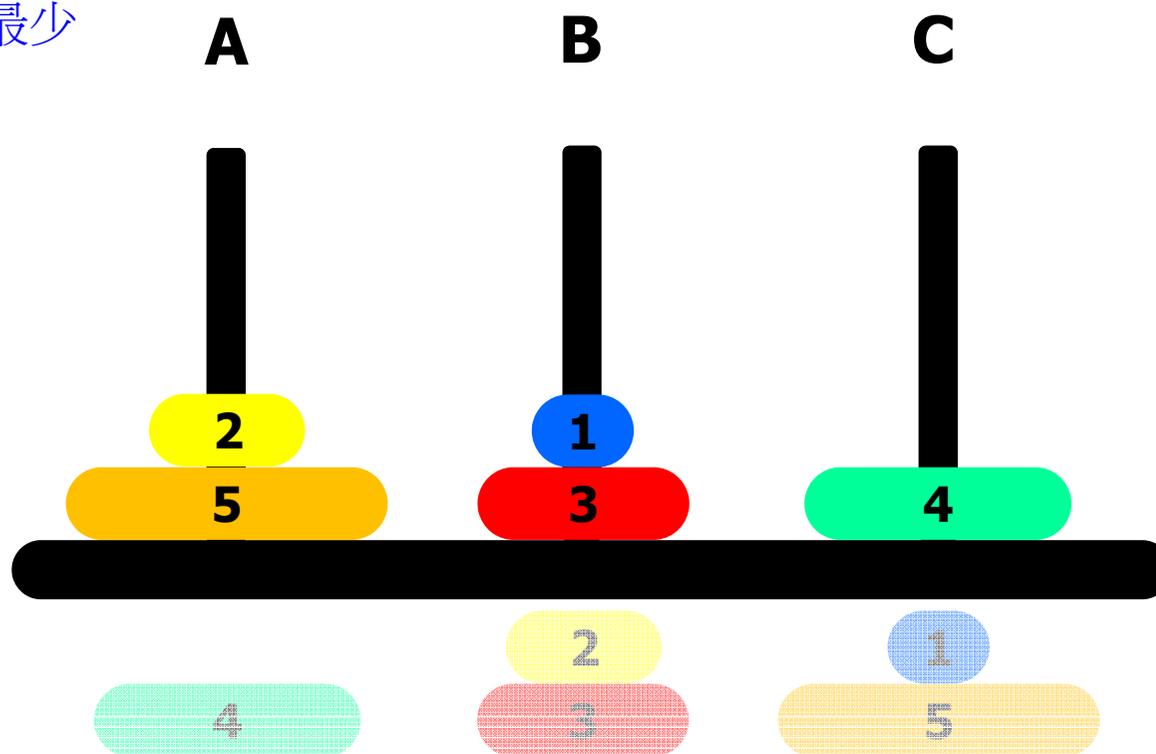
# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



# 由任意組態移成任意組態的河內塔

要求: 移動次數最少

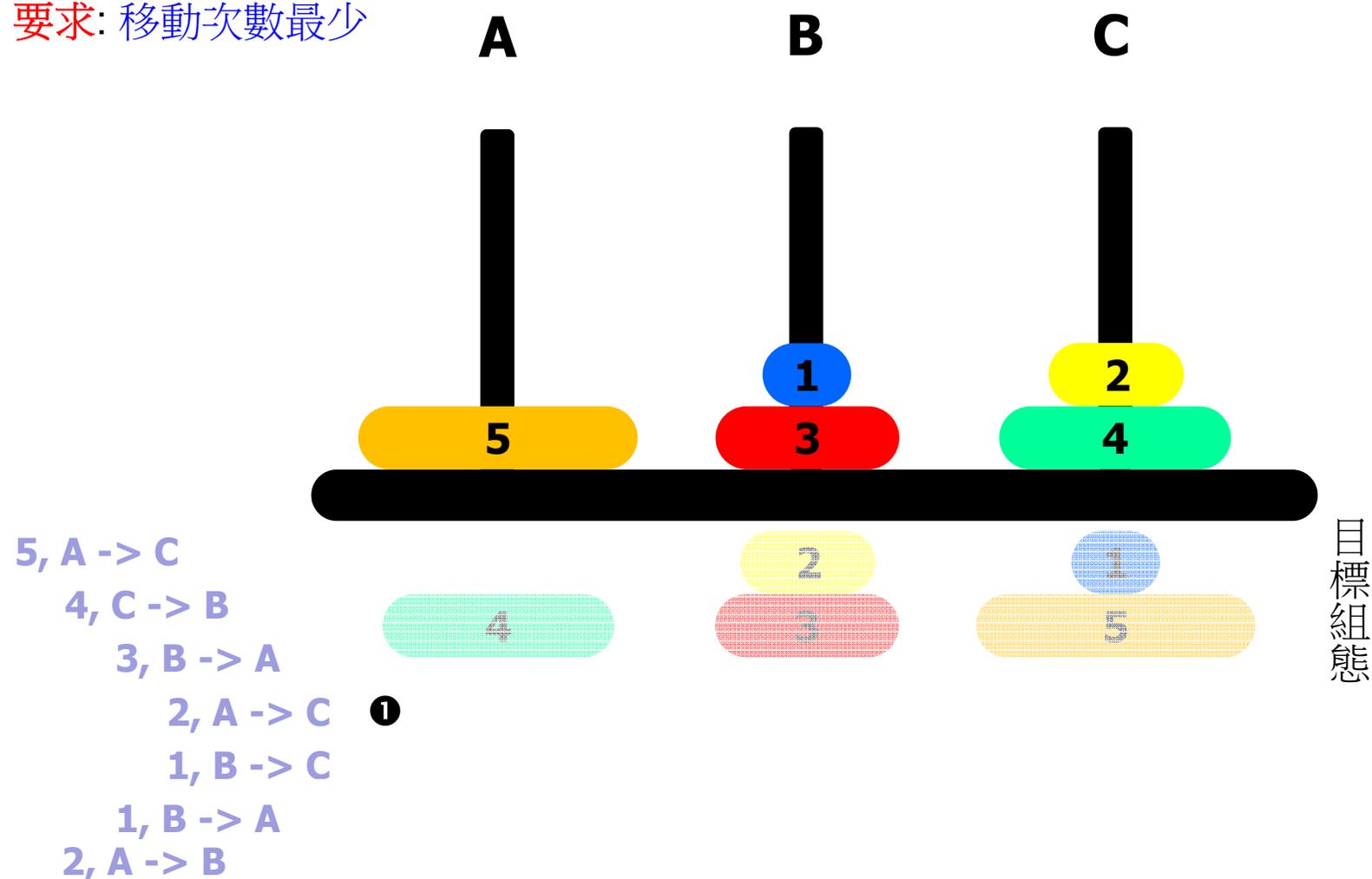


5, A -> C  
4, C -> B  
3, B -> A  
2, A -> C  
1, B -> C  
1, B -> A  
2, A -> B

目標組態

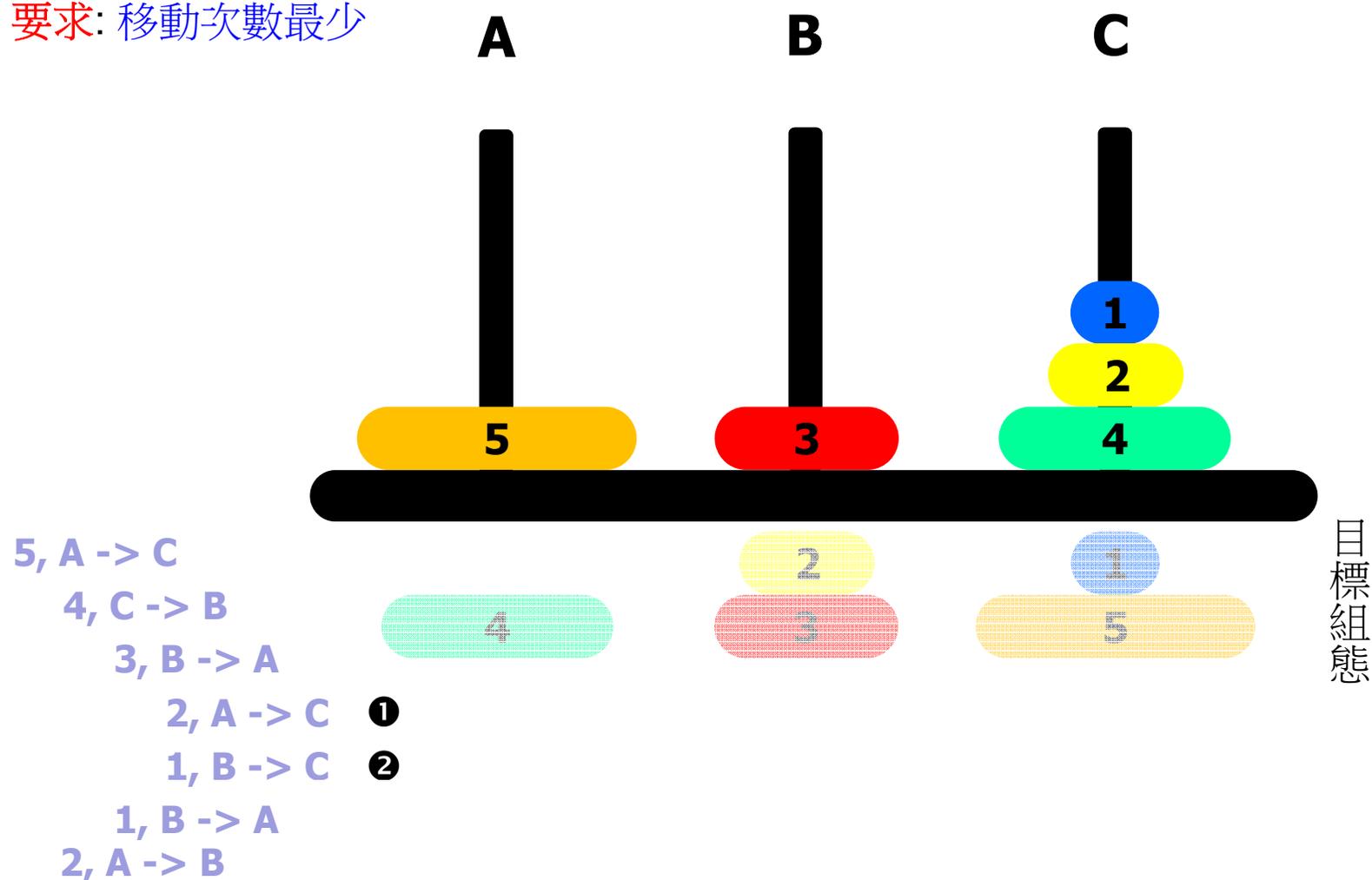
# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



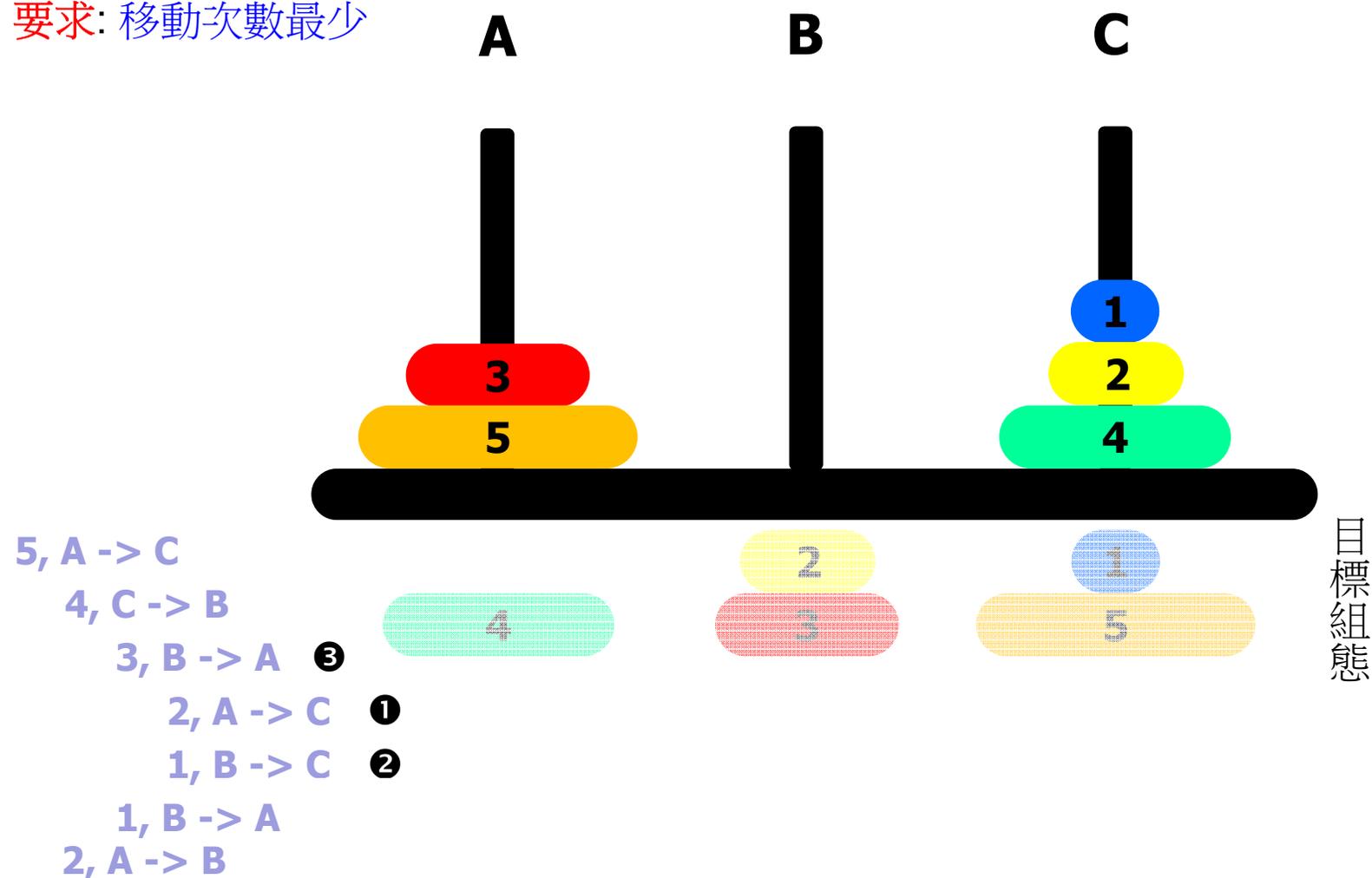
# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



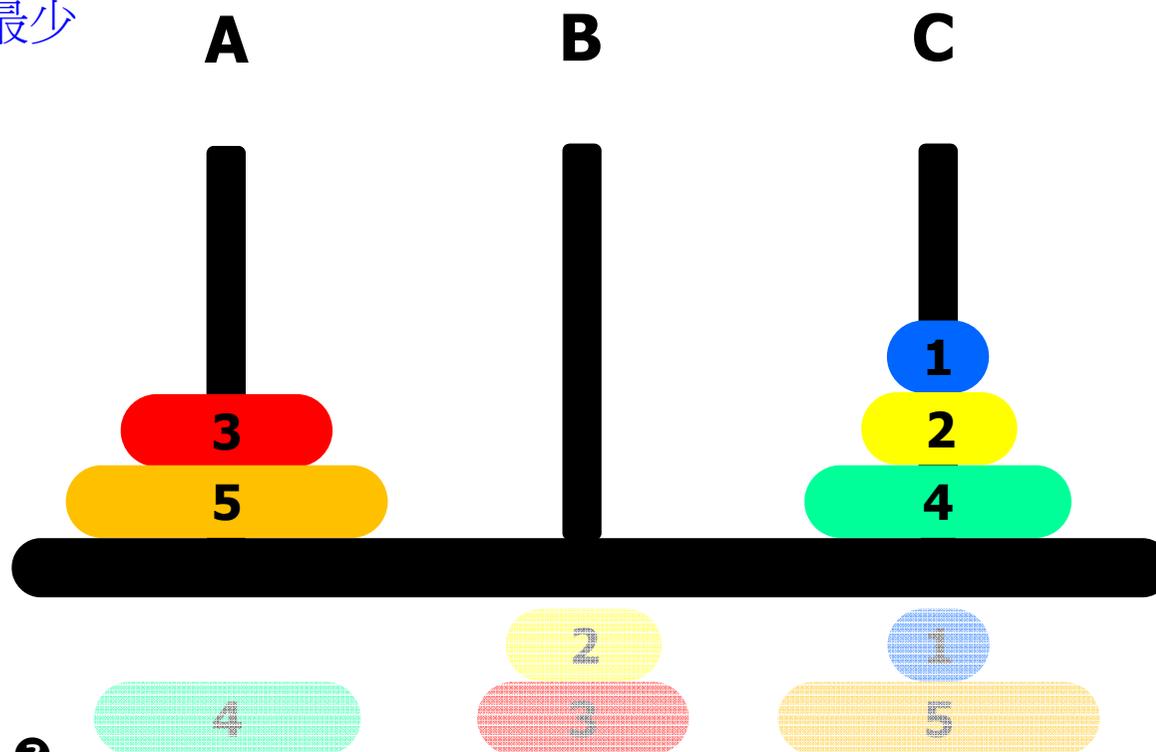
# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



目標組態

5, A -> C

4, C -> B

3, B -> A ③

2, A -> C ①

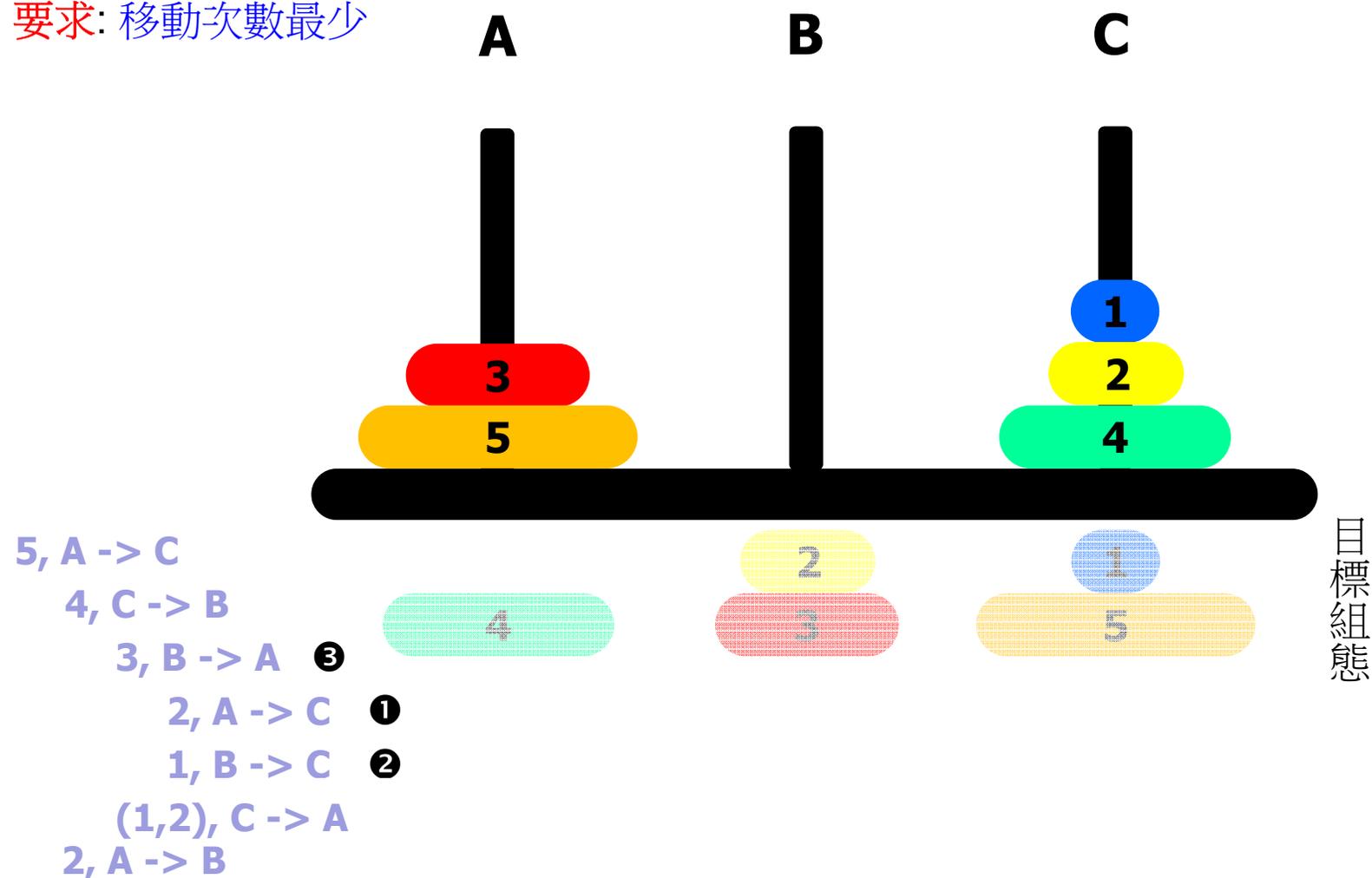
1, B -> C ②

~~1, B -> A~~

2, A -> B

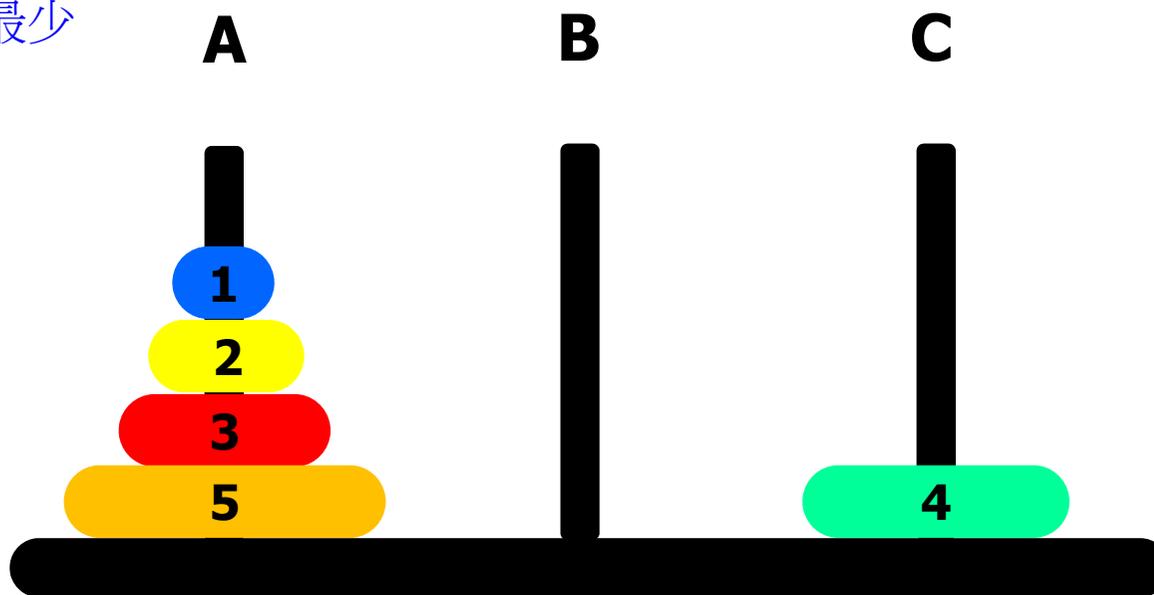
# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



5, A -> C

4, C -> B

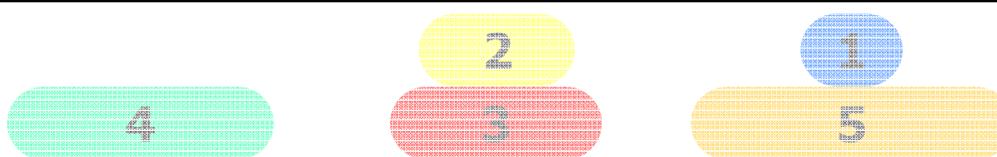
3, B -> A ③

2, A -> C ①

1, B -> C ②

(1,2), C -> A ④

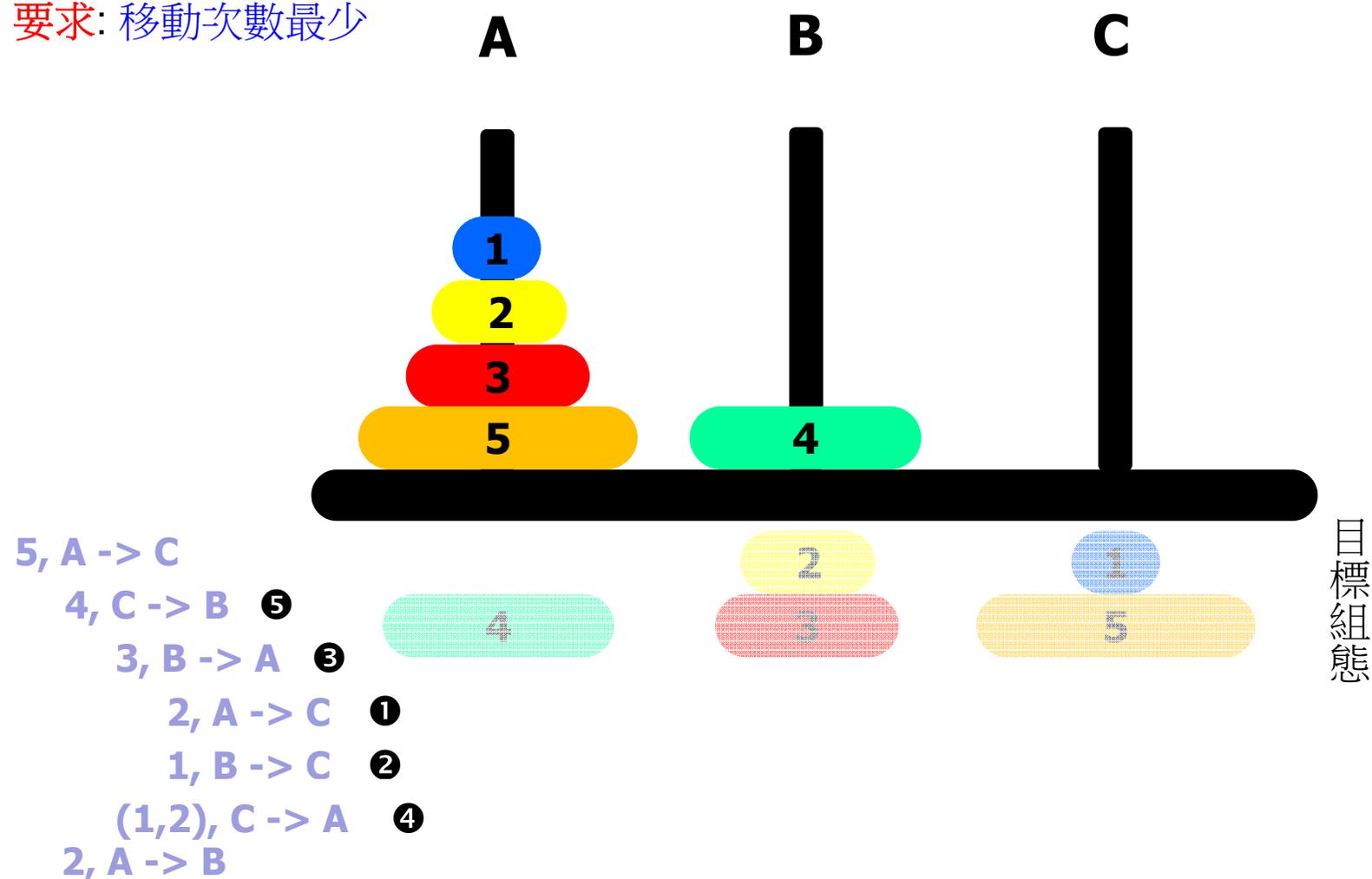
2, A -> B



目標組態

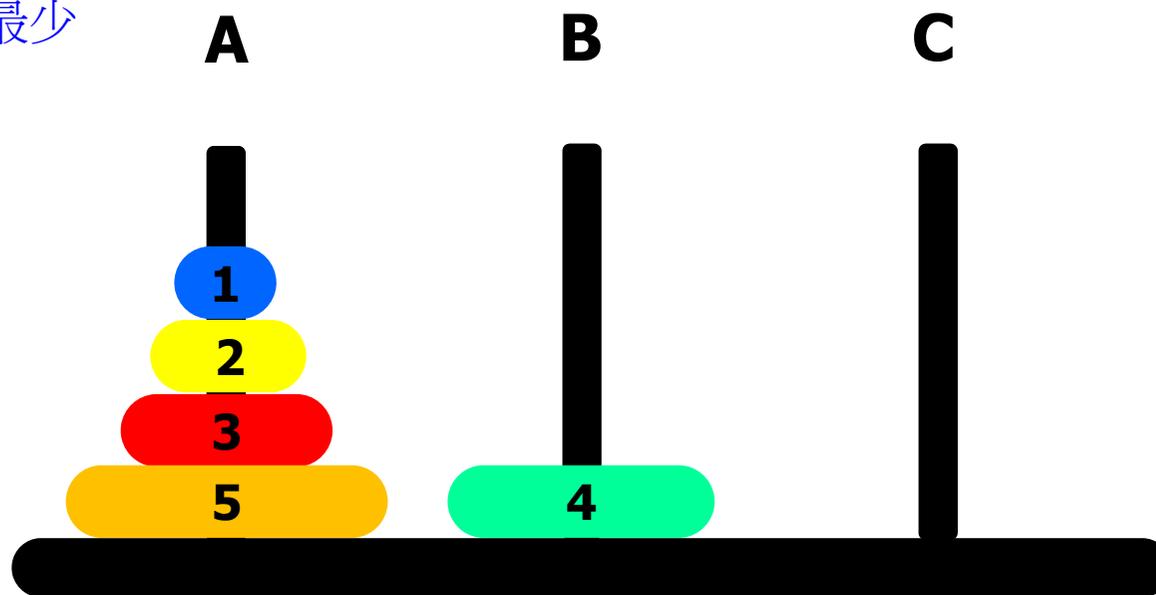
# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



5, A -> C

4, C -> B ⑤

3, B -> A ③

2, A -> C ①

1, B -> C ②

(1,2), C -> A ④

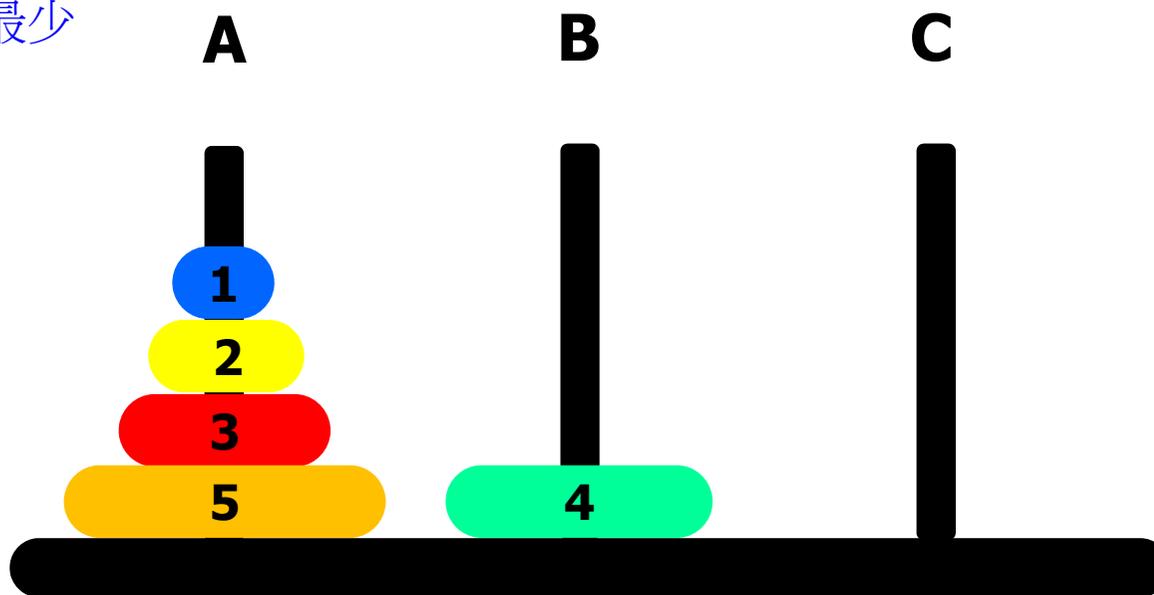
~~2, A -> B~~



目標組態

# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



5, A -> C

4, C -> B ⑤

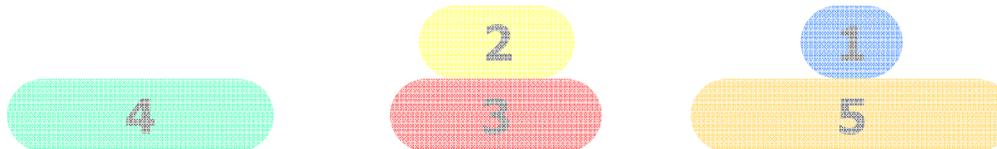
3, B -> A ③

2, A -> C ①

1, B -> C ②

(1,2), C -> A ④

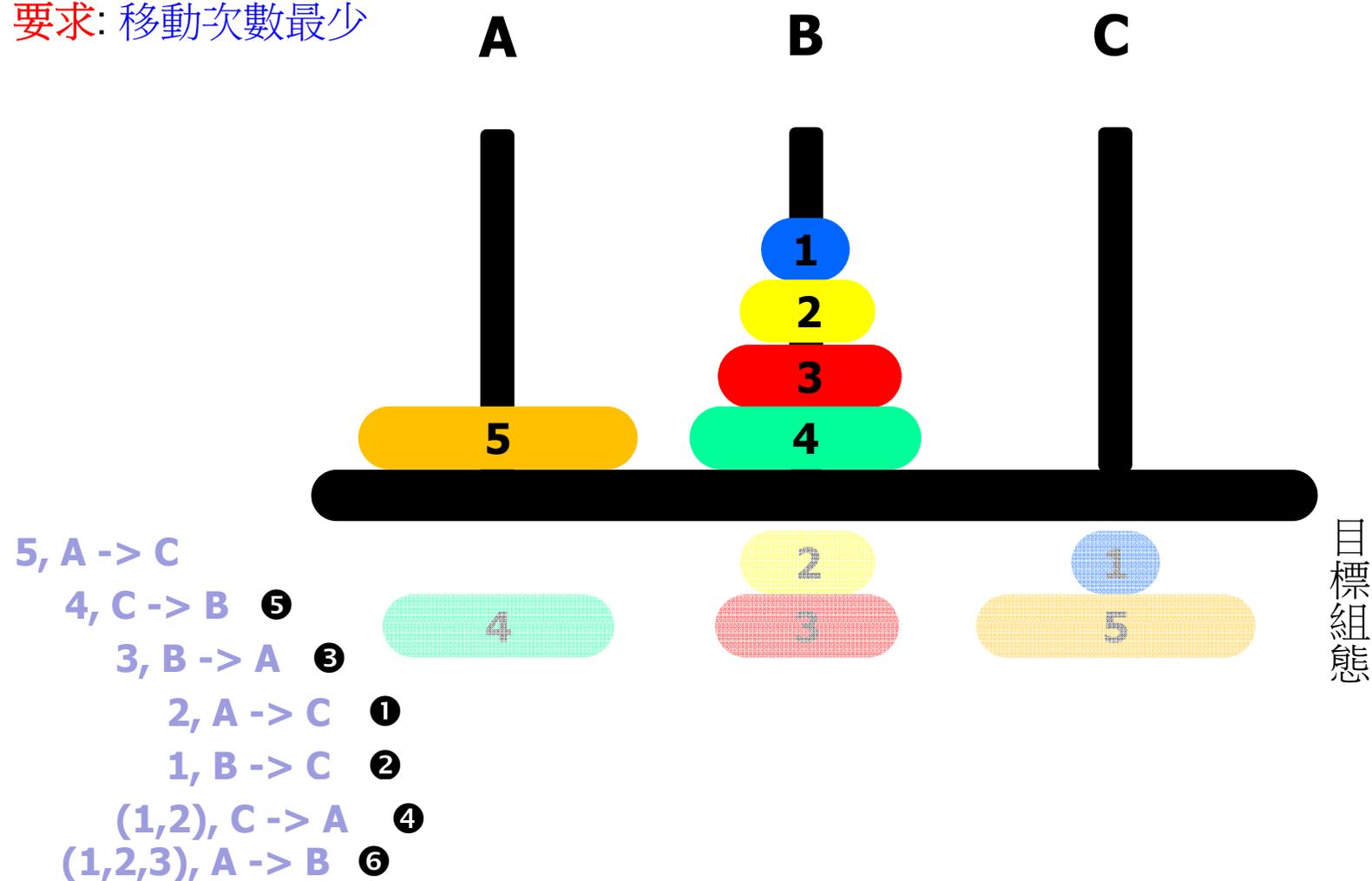
(1,2,3), A -> B



目標組態

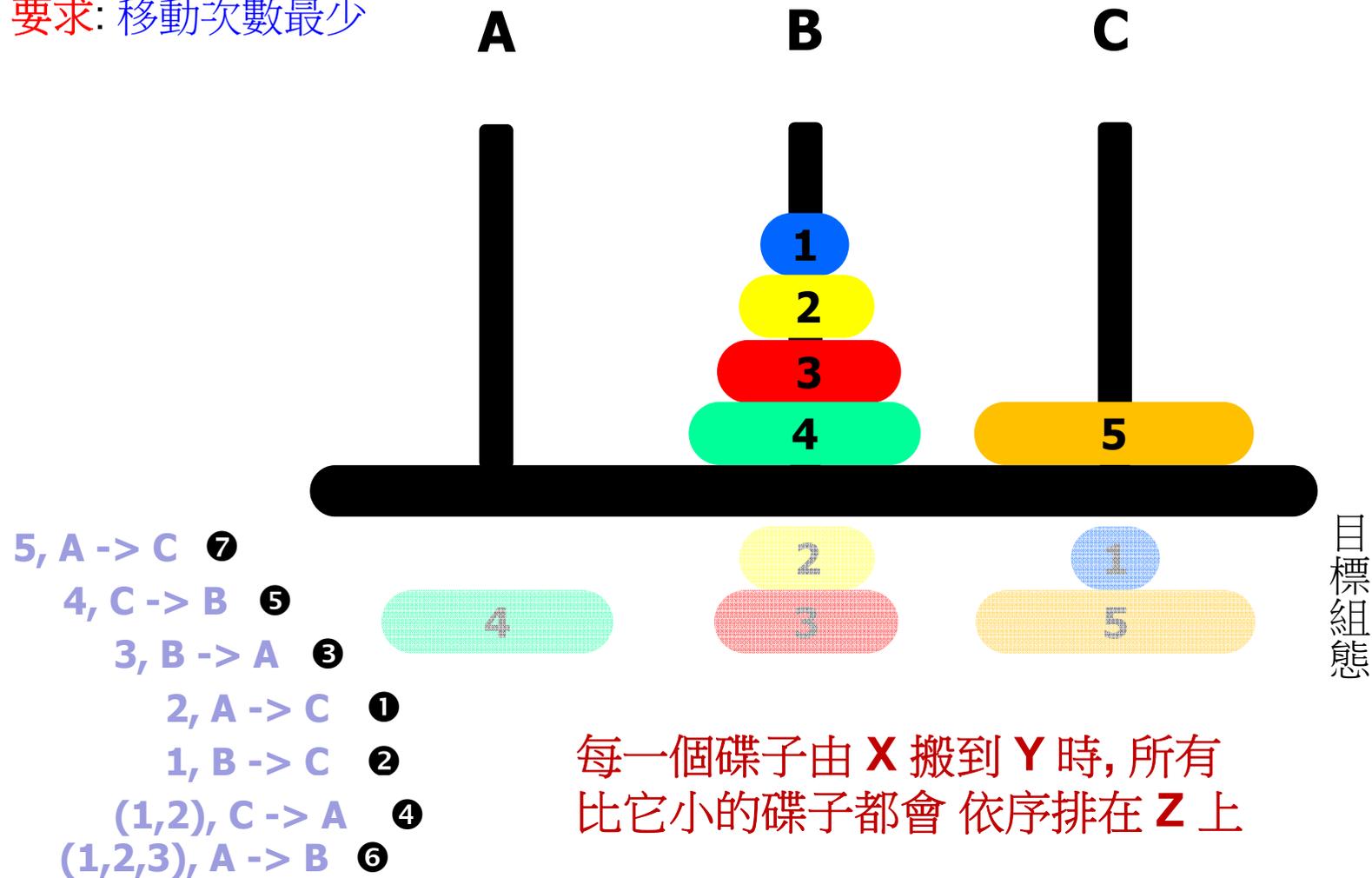
# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



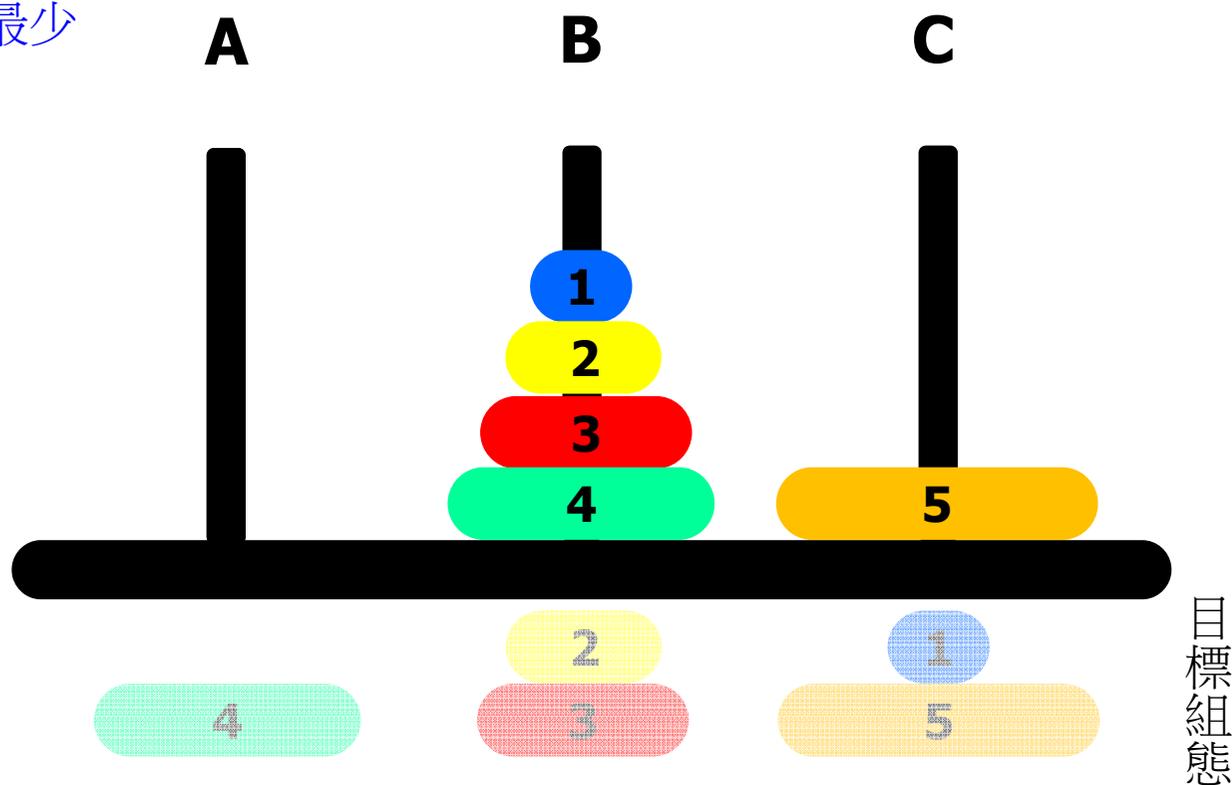
# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



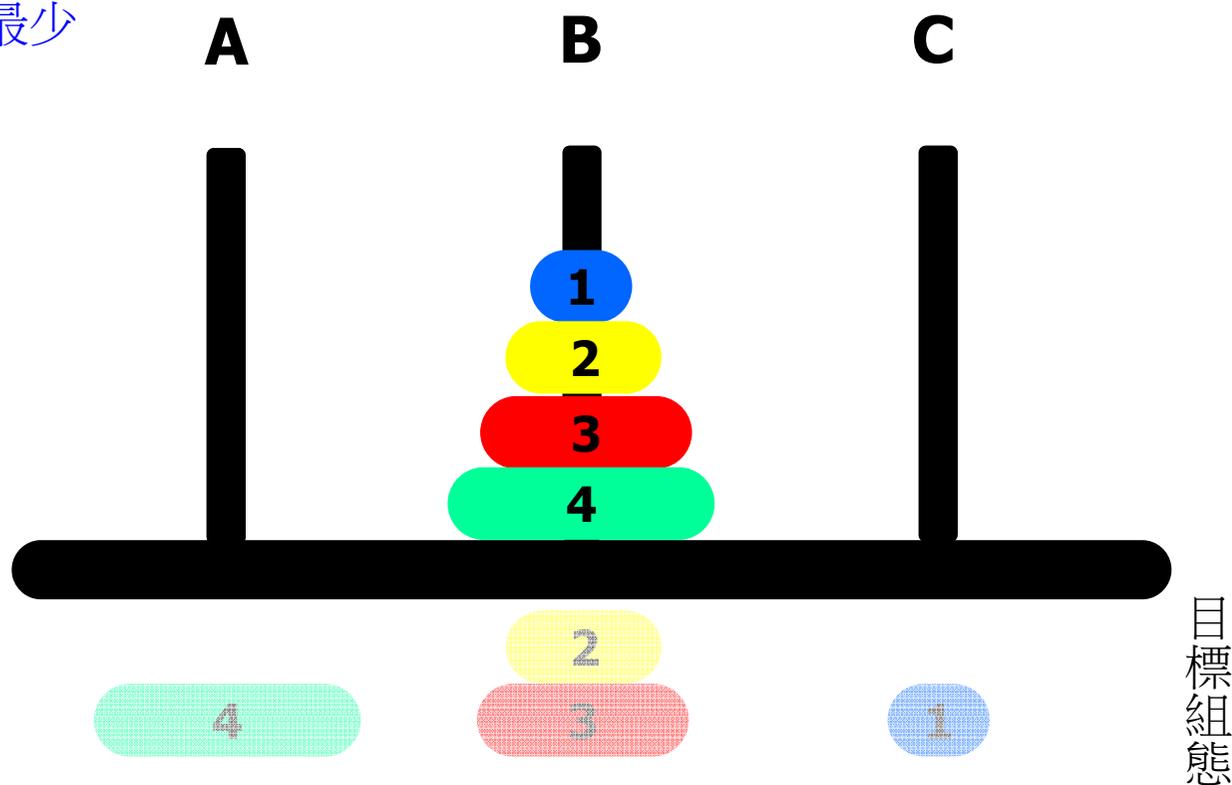
# 由任意組態移成任意組態的河內塔

要求: 移動次數最少



# 由任意組態移成任意組態的河內塔

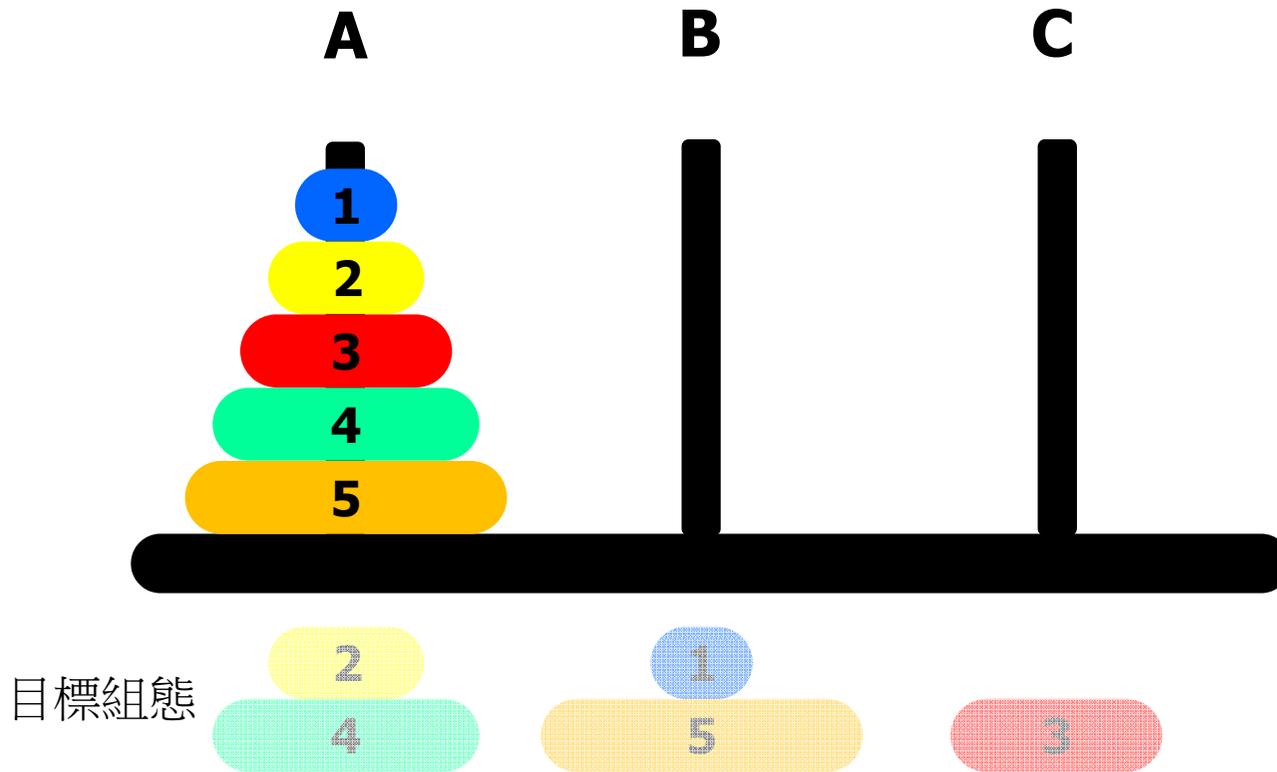
要求: 移動次數最少



問題變小了, 問題也變簡單了 (所有的碟子已經排好), 運用前面的方法繼續下去, 也可以把方法再簡化一些

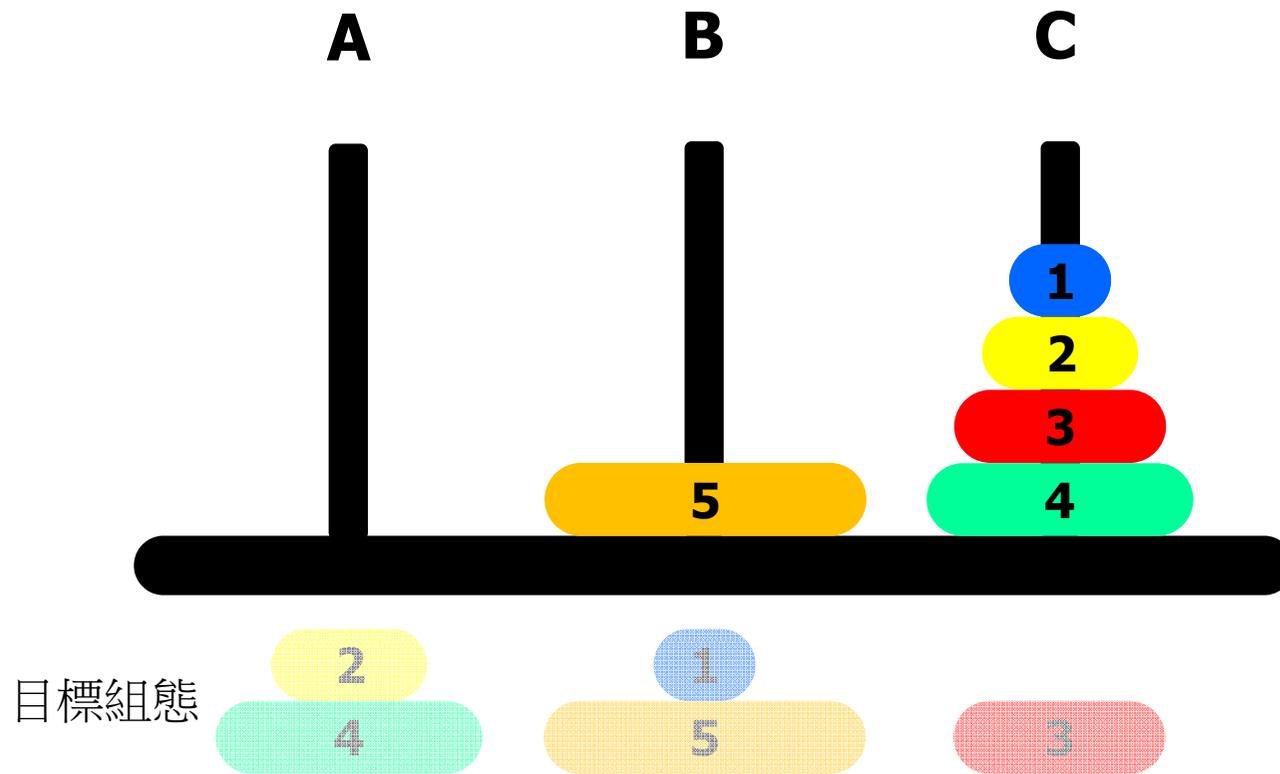
# 由一疊順序排好的碟子到任意組態

要求: 移動次數最少



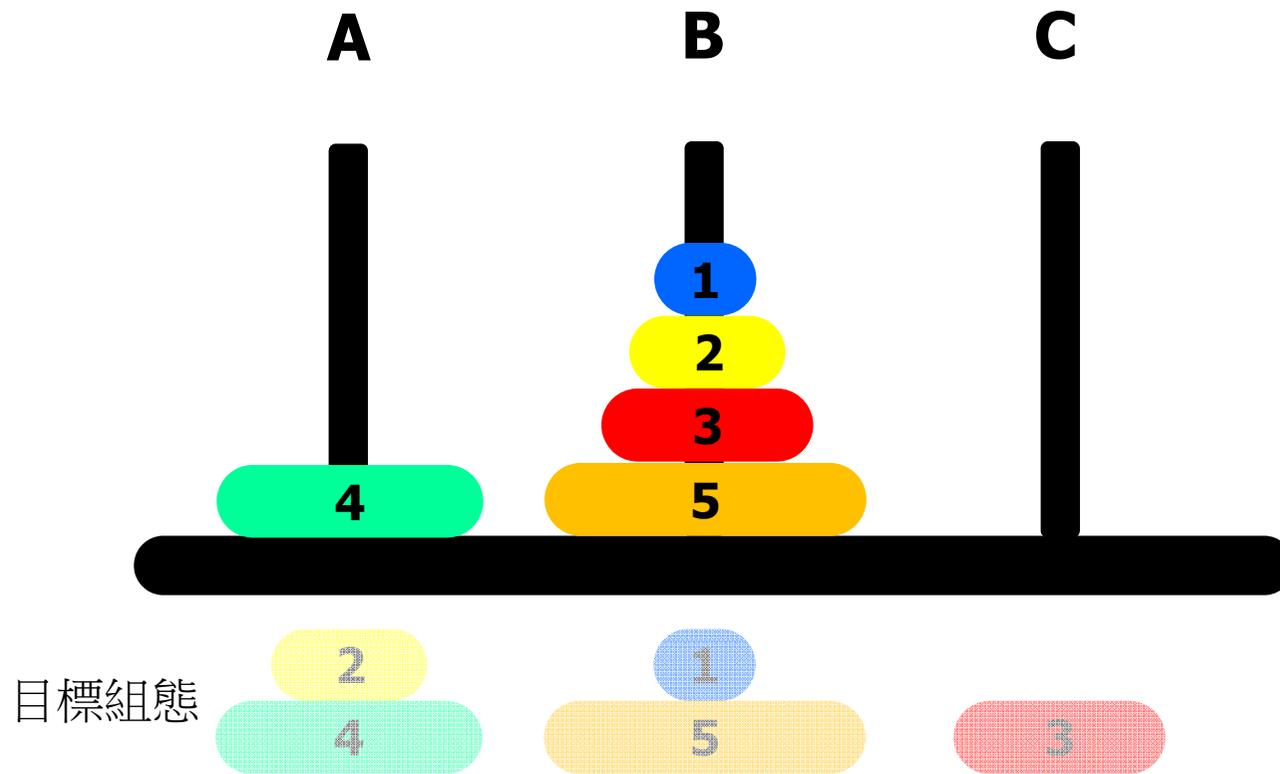
# 由一疊順序排好的碟子到任意組態

要求: 移動次數最少



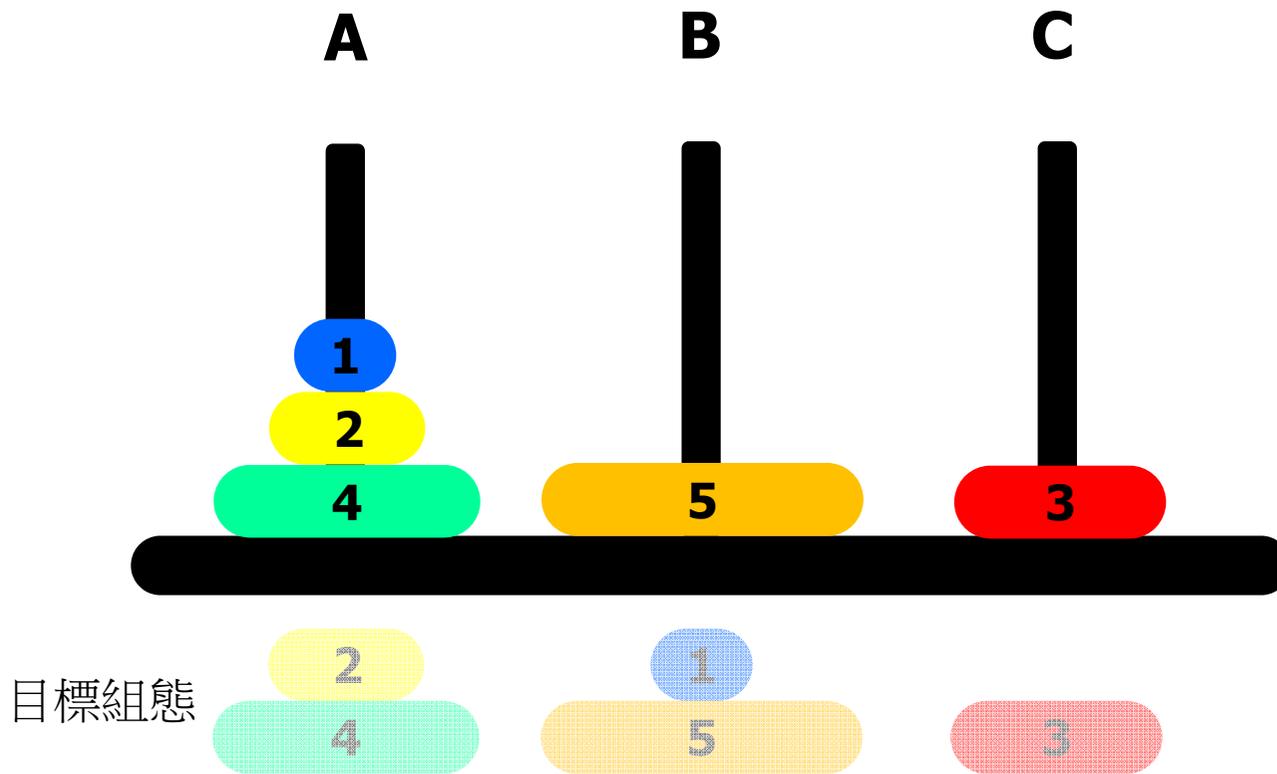
# 由一疊順序排好的碟子到任意組態

要求: 移動次數最少



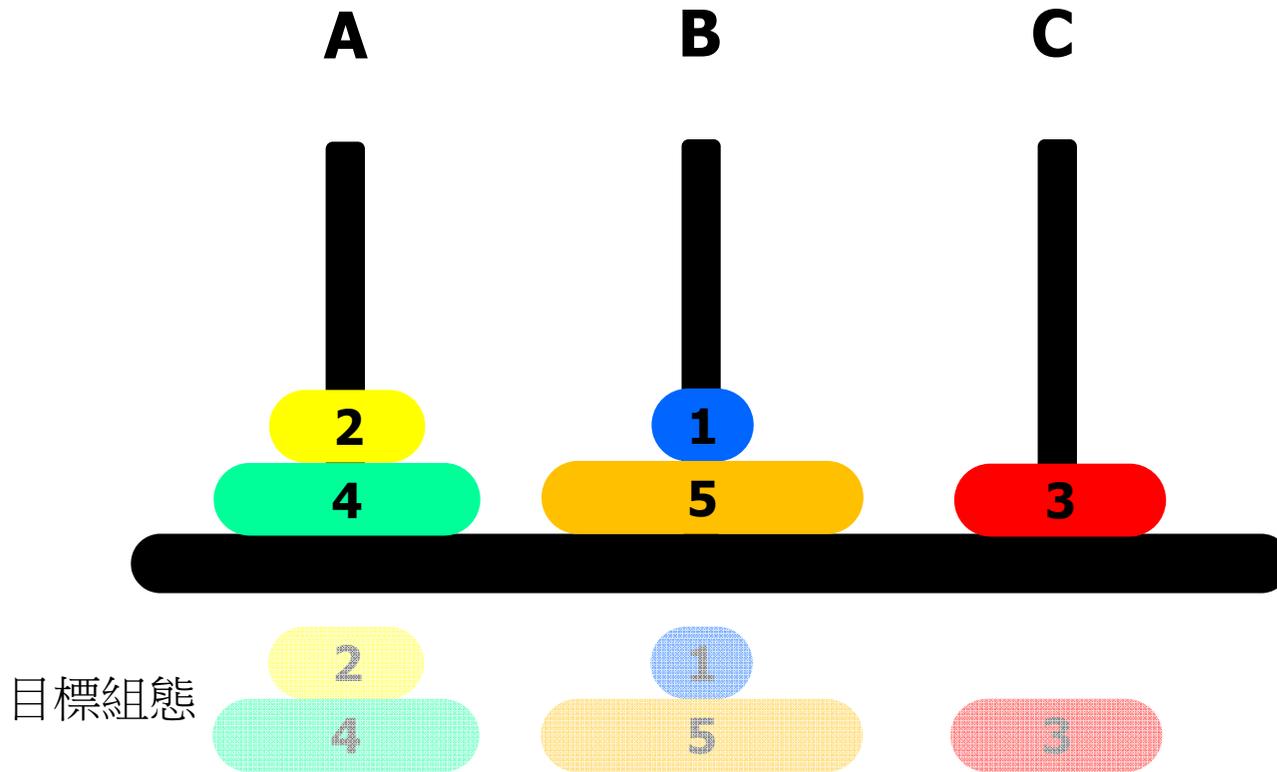
# 由一疊順序排好的碟子到任意組態

要求: 移動次數最少



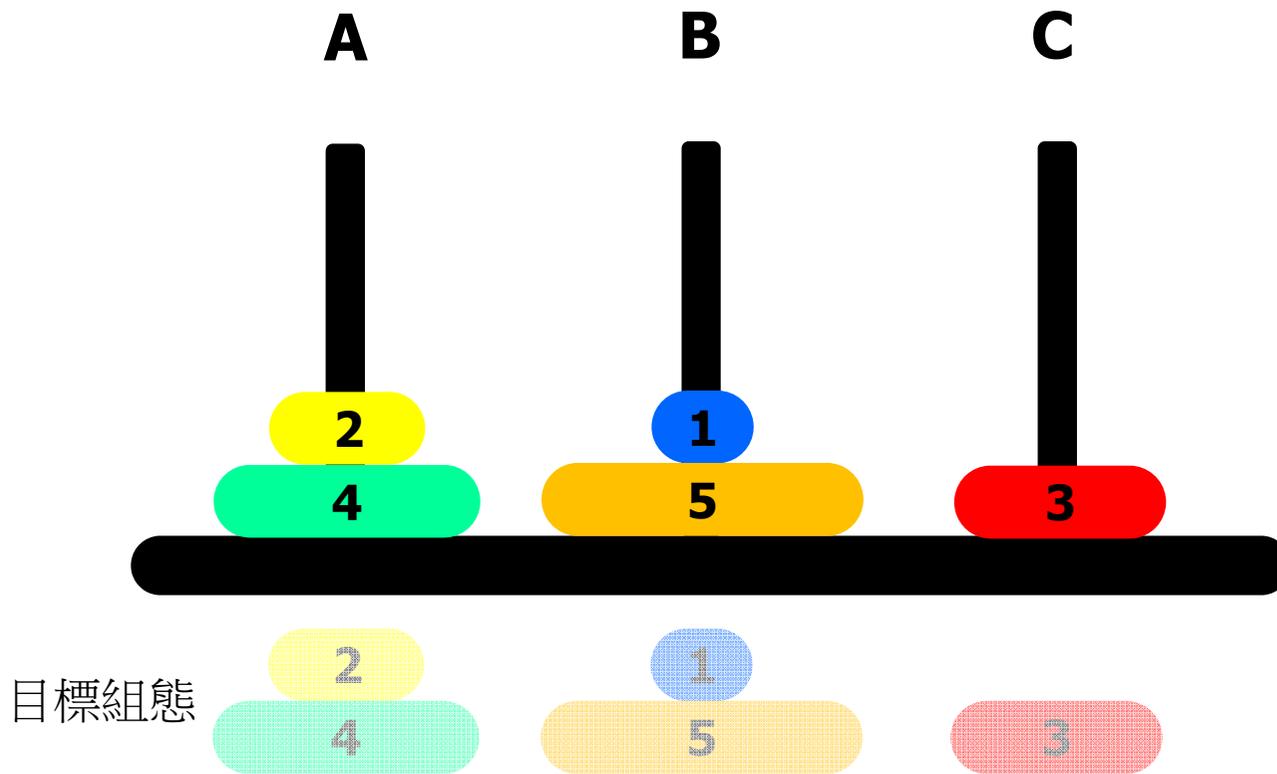
# 由一疊順序排好的碟子到任意組態

要求: 移動次數最少



# 由一疊順序排好的碟子到任意組態

要求: 移動次數最少



最後兩個碟子移動時，分解開來可能可以省掉一兩個動作