俄罗斯方块设计

数据结构和算法的设计

数据结构的设计

- 舞台的数据结构
- 砖块的数据结构

舞台的数据结构

用二维数组表示方块所在的整个舞台区域，得到一个10 * 20的全为0二维数组矩阵。0表示无方块，1表示有方块。

[1,10]

[1,20]

```
[
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 1],
[0, 0, 0, 0, 0, 0, 0, 0, 0, 1],
[0, 0, 0, 0, 0, 0, 0, 0, 3, 1],
[0, 1, 0, 1, 1, 3, 3, 0, 3, 1],
[1, 1, 1, 1, 1, 0, 3, 3, 3, 3],
]
```

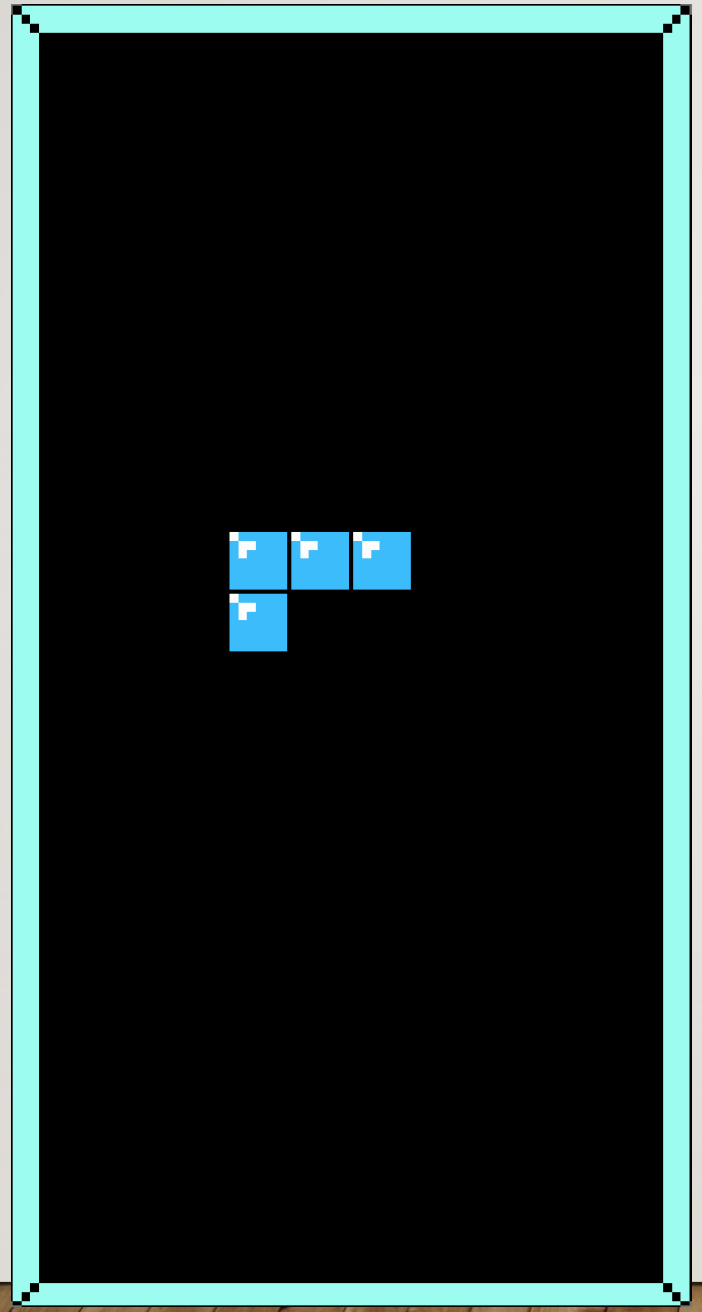
舞台的现状数据结构-FIELD数组

[1,11]

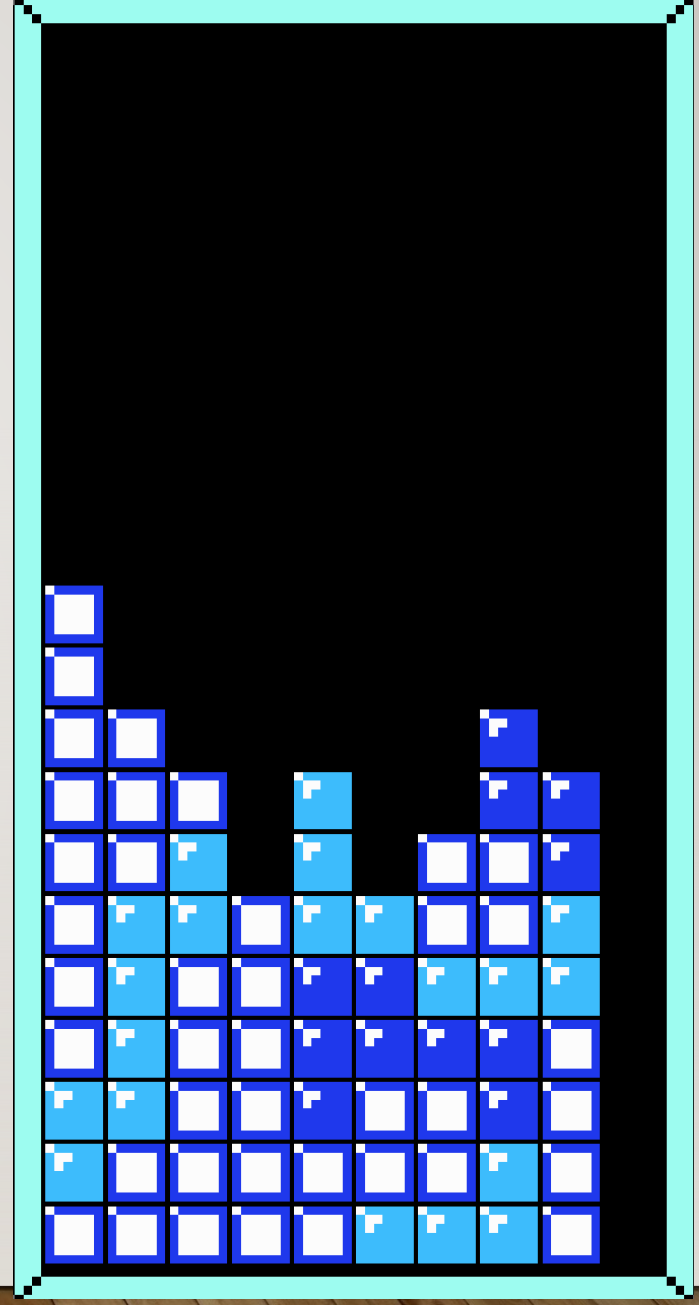
```
[
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0],
[1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1],
]
```

[1,22]

Line 1: 0000000000
Line 2: 0000000000
Line 3: 0000000000
Line 4: 0000000000
Line 5: 0000000000
Line 6: 0000000000
Line 7: 0000000000
Line 8: 0000000000
Line 9: 0000000000
Line 10: 0000000000
Line 11: 0000000000
Line 12: 0000000000
Line 13: 0000000000
Line 14: 0000000000
Line 15: 0000000000
Line 16: 0000000000
Line 17: 0000000000
Line 18: 0000000000
Line 19: 0000000000
Line 10: 0000000000
Line 21: 0000000000
Line 22: 1111111111

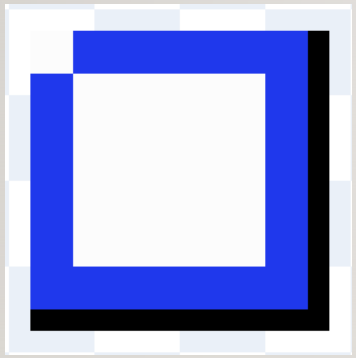


Line 1: 0000000000
Line 2: 0000000000
Line 3: 0000000000
Line 4: 0000000000
Line 5: 0000000000
Line 6: 0000000000
Line 7: 0000000000
Line 8: 0000000000
Line 9: 0000000000
Line 10: 0000000000
Line 11: 1000000000
Line 12: 1000000000
Line 13: 1110000100
Line 14: 1111010010
Line 15: 1111010110
Line 16: 1111111110
Line 17: 1111111110
Line 18: 1111111110
Line 19: 1111111110
Line 10: 1111111110
Line 21: 1111111110
Line 22: 1111111111

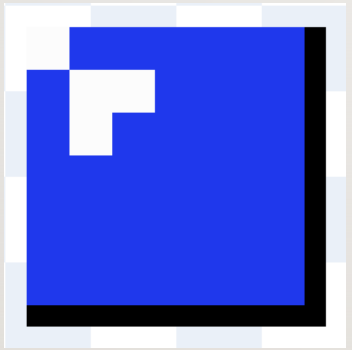


砖块的数据结构-TETRONIMO

0

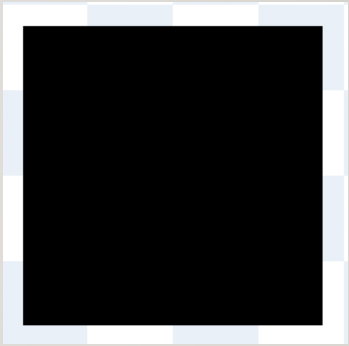


1



2

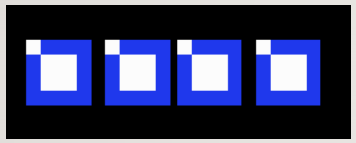
Black



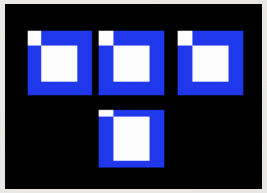
Tetris Dead

砖块的数据结构

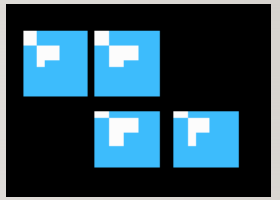
```
[ [0, 0, 0, 0],
  [0, 0, 0, 0],
  [1, 1, 1, 1],
  [0, 0, 0, 0],]
```



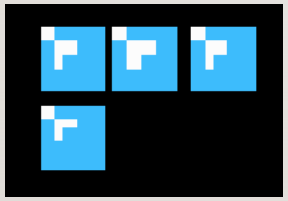
```
[ [0, 0, 0, 0],
  [1, 1, 1, 0],
  [0, 1, 0, 0],
  [0, 0, 0, 0]]
```



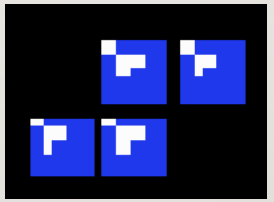
```
[ [0, 0, 0, 0],
  [3, 3, 0, 0],
  [0, 3, 3, 0],
  [0, 0, 0, 0]],
```



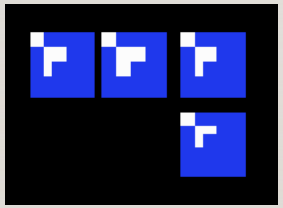
```
[ [0, 0, 0, 0],
  [3, 3, 3, 0],
  [3, 0, 0, 0],
  [0, 0, 0, 0]]
```



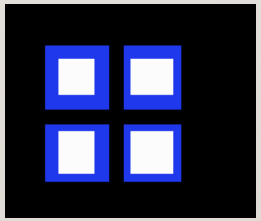
```
[ [0, 0, 0, 0],
  [0, 2, 2, 0],
  [2, 2, 0, 0],
  [0, 0, 0, 0]]
```



```
[ [0, 0, 0, 0],
  [2, 2, 2, 0],
  [0, 0, 2, 0],
  [0, 0, 0, 0], ]
```



```
[ [0, 0, 0, 0],
  [0, 1, 1, 0],
  [0, 1, 1, 0],
  [0, 0, 0, 0]]
```



砖块的数据结构-TETRONIMOES数组

Index 1: 0000111001000000010011000100000000100111000000000010001100100000

Index 2: 0000222000200000020002002200000020002220000000000220020002000000

Index 3: 0000330003300000030033003000000

Index 4: 0000011001100000000001100110000

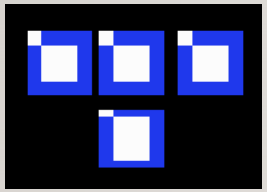
Index 5: 0000022022000000200022002000000

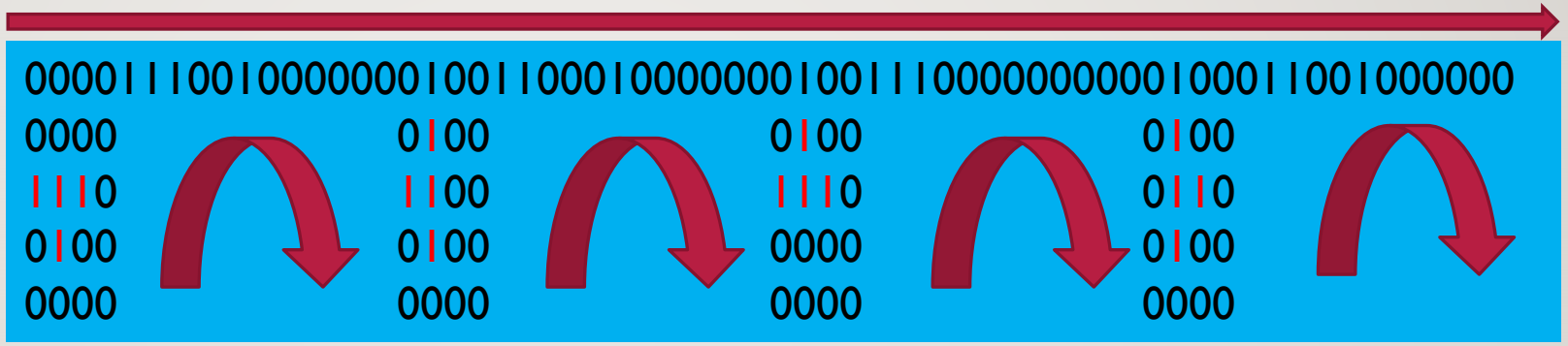
Index 6: 0000333030000000330003000300000000303330000000000300030003300000

Index 7: 0000000011110000010001000100100

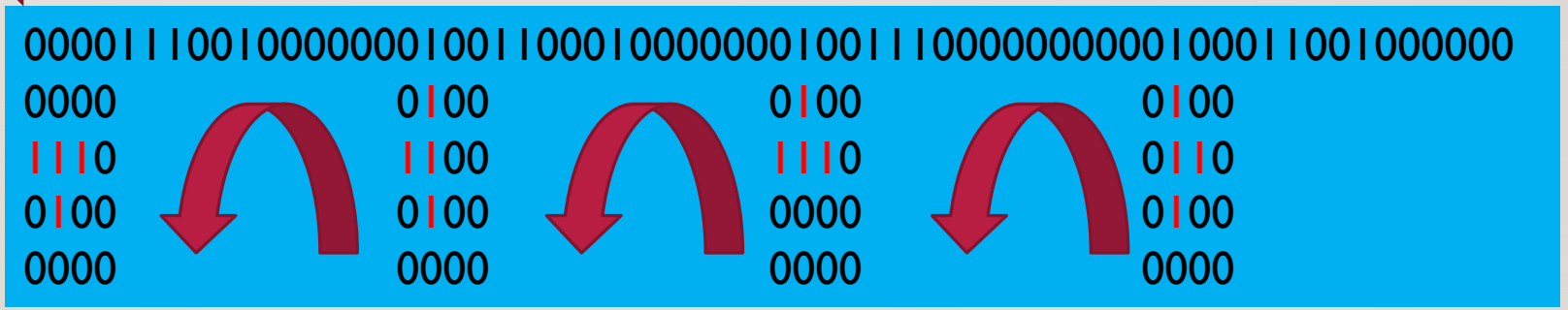
砖块的数据结构-TETRONIMOES数组-INDEX I

Clockwise



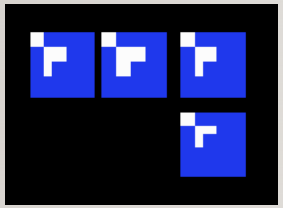


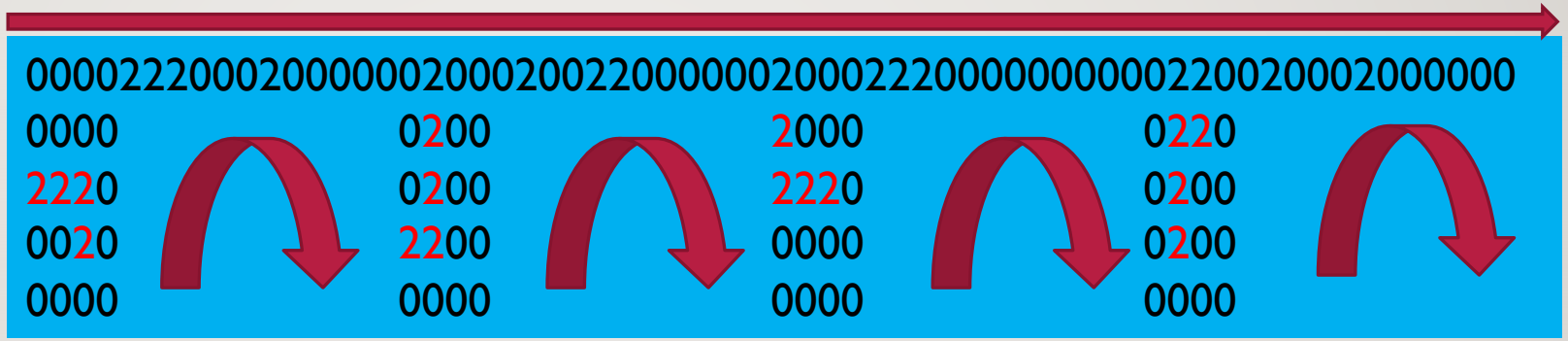
Anti-clockwise



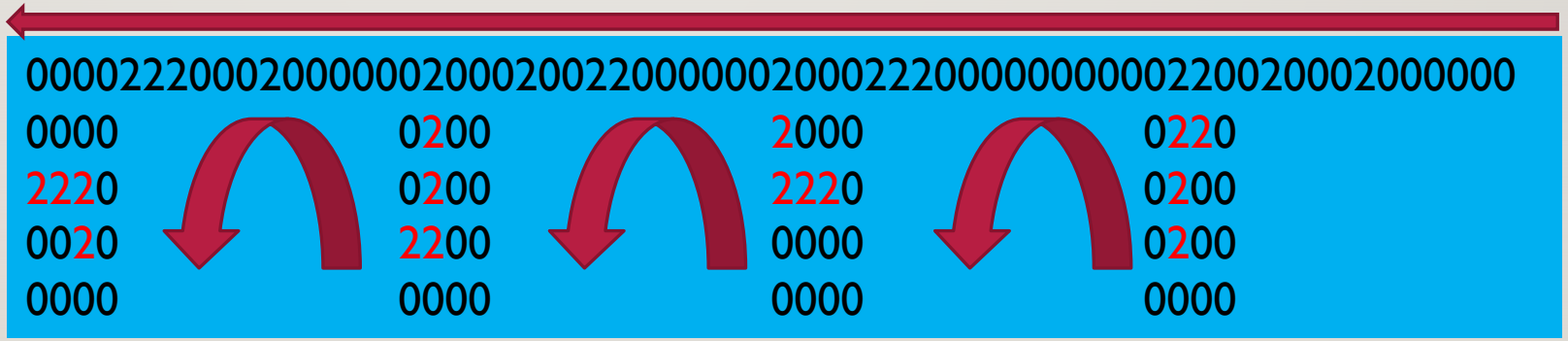
砖块的数据结构-TETRONIMOES数组-INDEX 2

Clockwise



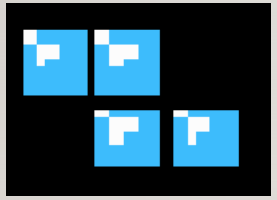


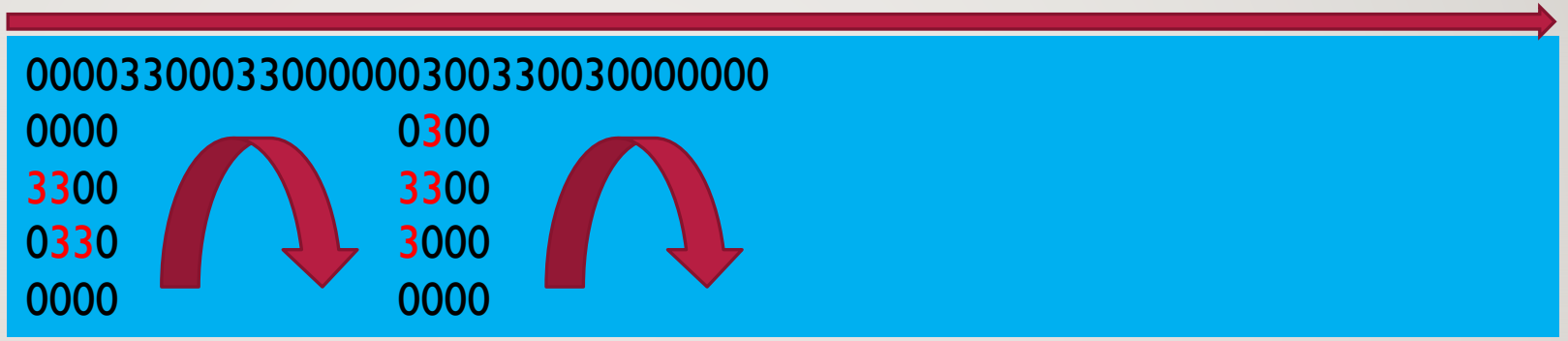
Anti-clockwise



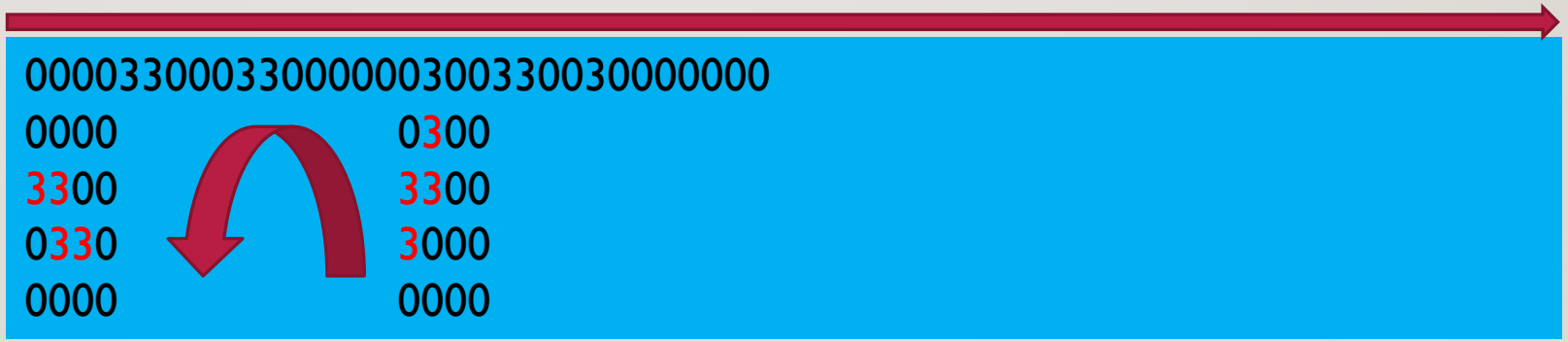
砖块的数据结构-TETRONIMOES数组-INDEX 3

Clockwise



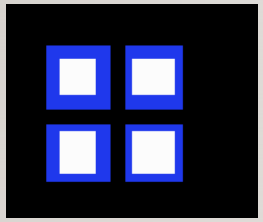


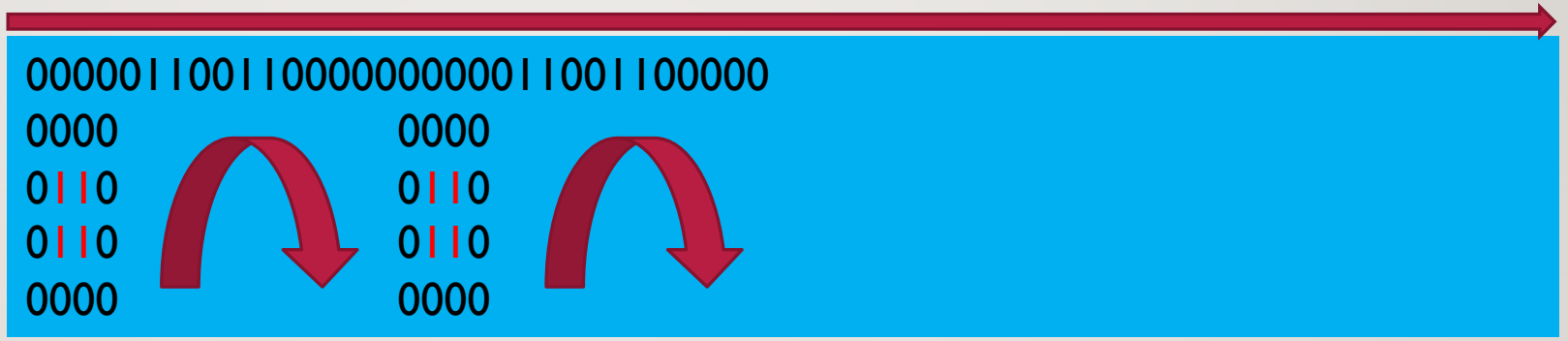
Anti-clockwise



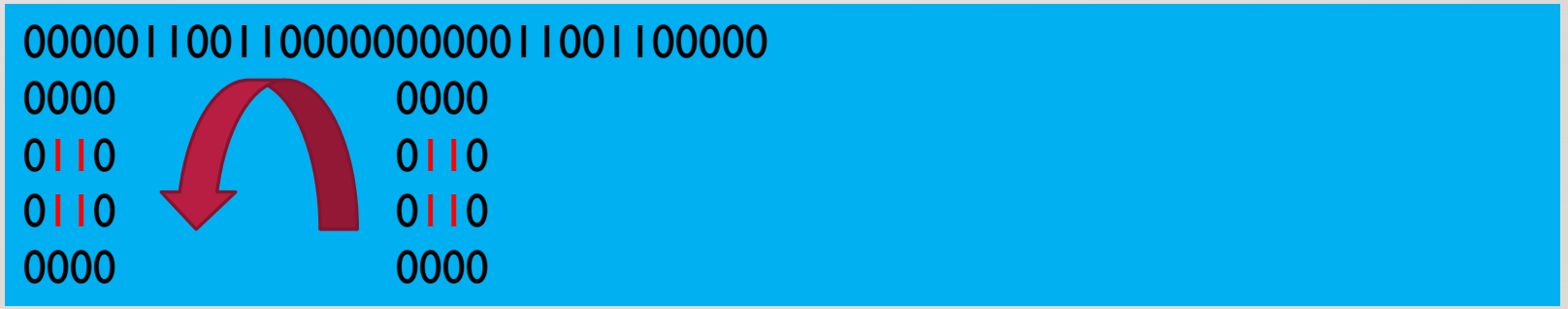
砖块的数据结构-TETRONIMOES数组-INDEX 4

Clockwise



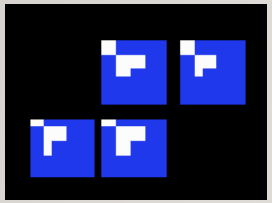


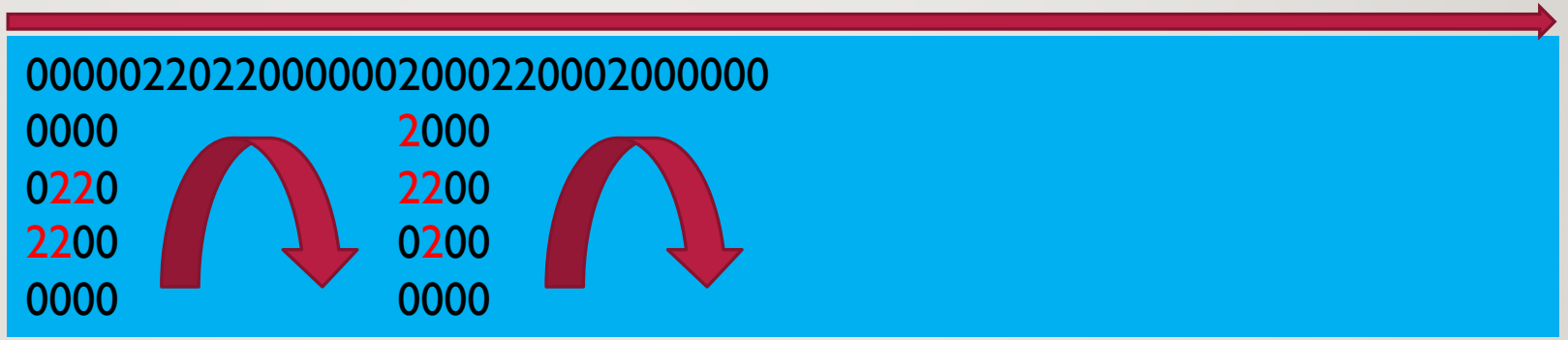
Anti-clockwise



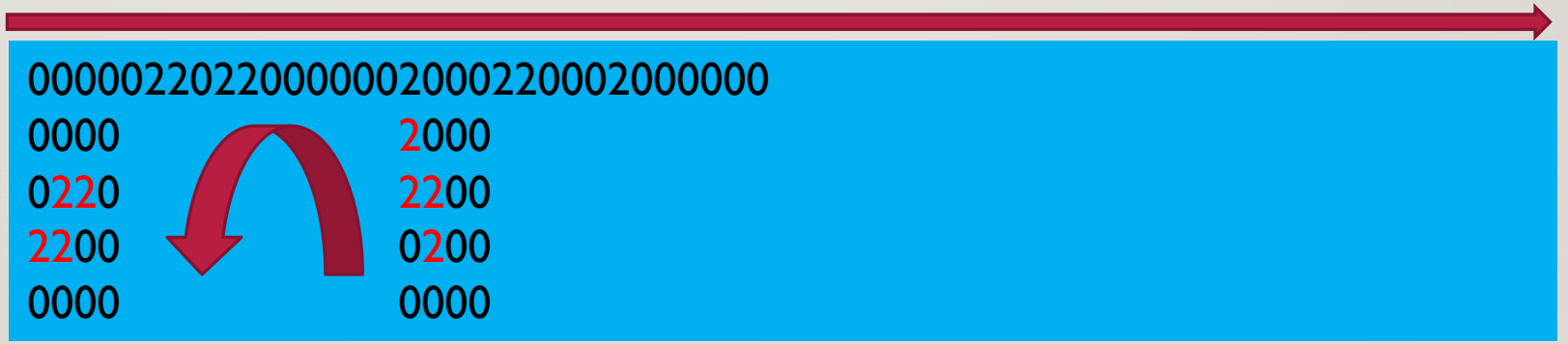
砖块的数据结构-TETRONIMOES数组-INDEX 5

Clockwise



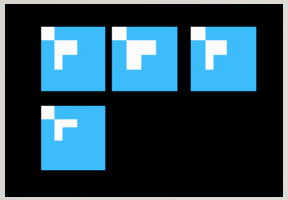


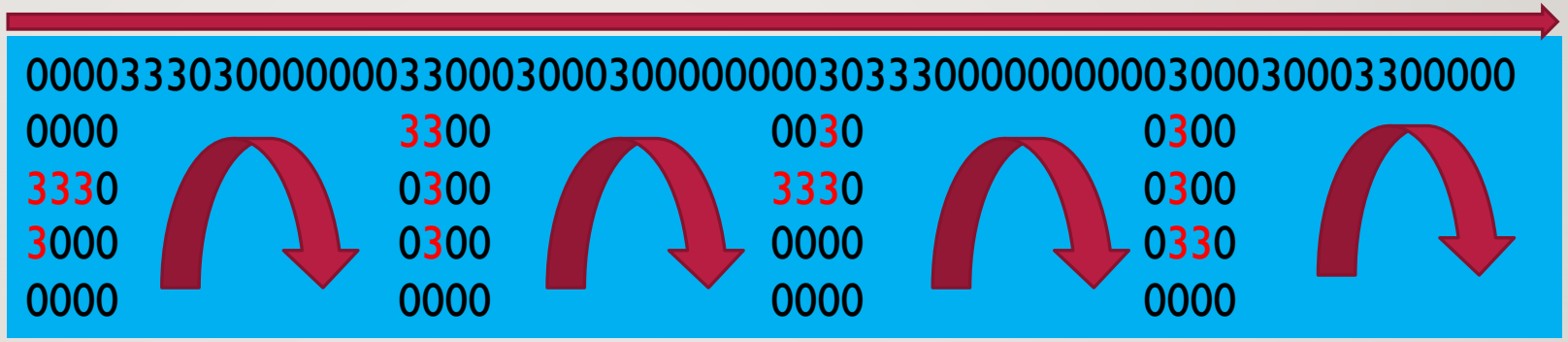
Anti-clockwise



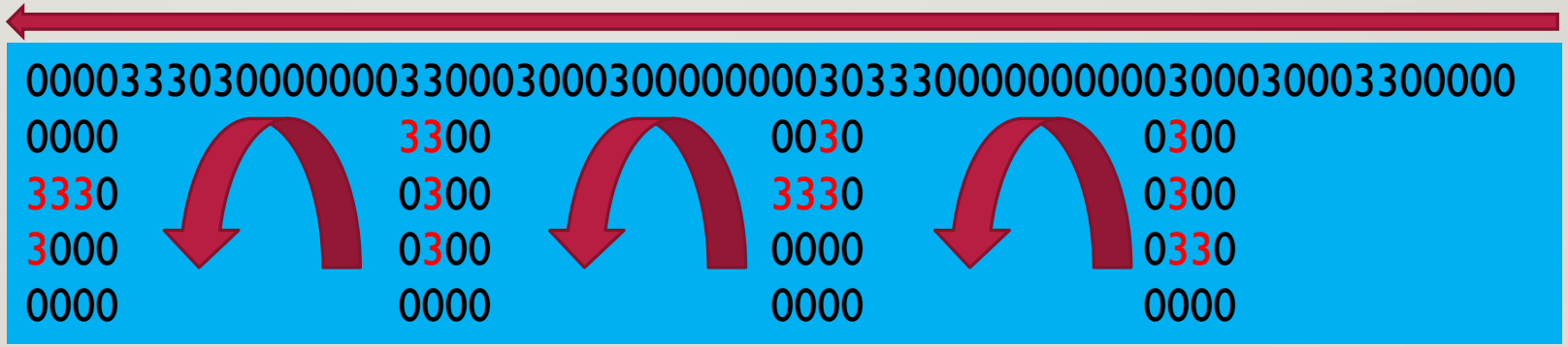
砖块的数据结构-TETRONIMOES数组-INDEX 6

Clockwise



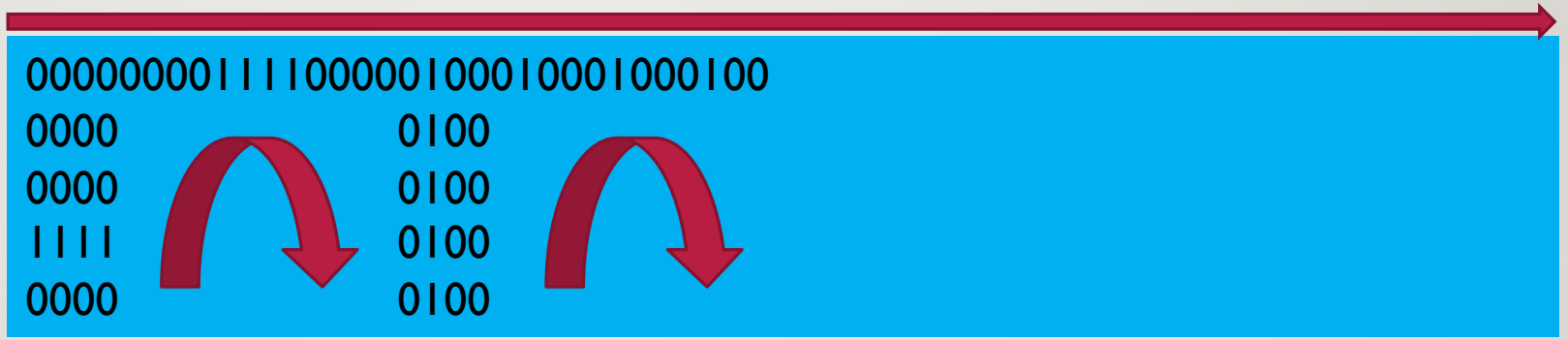


Anti-clockwise



砖块的数据结构-TETRONIMOES数组

Clockwise



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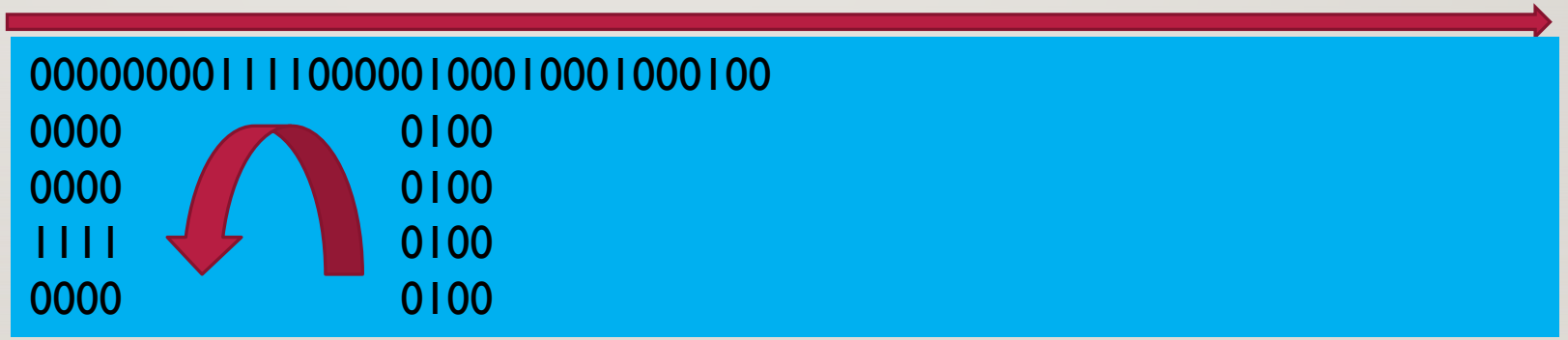
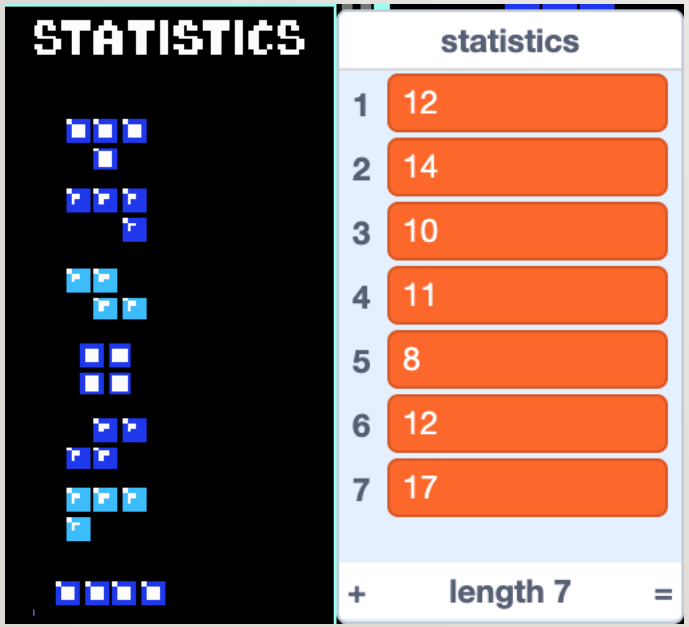


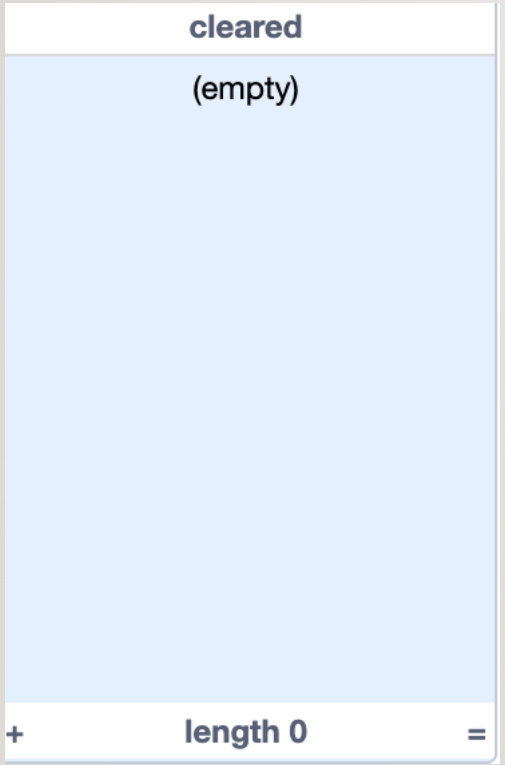
砖块统计数组-STATISTICS



速度数组-SPEEDS


speeds
1 48
2 43
3 38
4 33
5 28
6 23
7 18
8 13
9 8
10 5
11 5
12 5
13 4
+ length 30 =

行消除相关数组-CLEARED



辅助变量定义

- ☁️Global records 历史最高分
- ☁️Score
- Block
- Clearedraws
- Drop
- Dropbonus
- Droptimer
- Dst
- gameover
- Hit
- Key
- Level
- Lines
- Nextplace
- Numclones
- Score
- Speed
- src

x