Sudocue-top10000 #05

Code: copy givens
...19.....1.....9.....3.8.1.6...493...5.8.1...945...8.9.3.4.....2.....7.....59...

After some moves of HoDoKu Techniques such as:
Locked Candidates Type 1, Naked Triple, Naked Single, Empty
Rectangle, Finned Swordfish.
And before a Sue de Coq arrives.

Copy Candidates:

```
.--------------------.-------------------.-------------------.
| 2345678 34578 2678 | 1     9    25678  | 234567 2456 23467 |
| 2345678 1     2678 | 24678 267  25678  | 234567 9    23467 |
| 24567   457   9    | 2467  3    2567   | 8      2456 1     |
:--------------------+-------------------+-------------------:
| 1278    6     1278 | 27    127  4      | 9      3    5     |
| 237     37    5    | 9     8    2367   | 1      246  2467  |
| 1237    9     4    | 5     1267 12367  | 267    8    267   |
:--------------------+-------------------+-------------------:
| 9       578   3    | 2678  4    12678  | 256    1256 268   |
| 45      2     168  | 3     16   168    | 345    7    9     |
| 14678   478   1678 | 23678 5    9      | 2346   1246 23468 |
'--------------------'-------------------'-------------------'
```

U-Twins 1 from r9c8

Notice those three cells: r7c8 (red), r8c3 (blue) and r9c8 (blue).
If r9c8 is true, then r7c8 false and r8c3 true.
If r7c8 is true, then r8c3 and r9c8 false.

Coloring:
Cycle 1: blue
Cycle 2: red

Starting by cycle 1 (blue):
From r9c8 (cycle 1)

2

=> r7c8 (cycle 2) strong link with r9c8

=> r7c6 (cycle 1) strong link with r7c8

=> r8c3 (cycle 1) only cell in box 7 can be, because of r9c8

=> r4c3 (cycle 2) only cell outside box 7 on column 3 can be a hidden strong link for r8c3

=> r4c5 (cycle1) only cell outside box 4 on row 4 can be a hidden strong cell for r4c3

=> r6c1 (cycle 1) only cell in box 4 can be, because of r4c5

=> r9c1 (cycle 2) only cell outside box 4 on column 1 can be a hidden strong cell for r6c1.

Four cells r6c56 and r8c56, belonging to cycle 2 because of r4c5 (cycle 1) in box 5 and r7c6 (cycle 1) in box 8, make U-Twins.

This U-Twins belongs to cycle 2, so all cells of cycle 2 contain digit 1.

Cycle 2 (red) = 1

Conclusion: r4c3 = 1; r7c8 = 1 and r9c1 = 1.

After some basic moves, I come to the following grid.

Copy Candidates:

```
.------------------.-------------------.-------------------.
| 34567 34578 278 |1     9    2567 | 23467 2456 23467 |
| 34567 1     27  | 24678 267  25678 | 23467 9    23467 |
| 4567  457   9   | 2467  3    2567 |8     2456 1    |
:------------------+-------------------+-------------------:
| 8     6     1   | 27    27   4    |9     3    5    |
| 237   37    5   |9      8    2367 |1     246  2467 |
| 237   9     4   |5      1267 12367 | 267  8    267  |
:------------------+-------------------+-------------------:
| 9     578   3   | 2678  4    2678 | 256  1    268  |
| 45    2     68  |3      16   168  | 45   7    9    |
| 1     478   678 | 2678  5    9    | 2346 246  23468 |
'------------------'-------------------'-------------------'
```

Twins Construction Example

L-Twins 5 starting from r1c2

<u>Starting by cycle 1</u> (blue)
From r1c2 (cycle 1)
=> r7c2 (cycle 2) only cell outside box 1 in column 2
=> r8c1 (cycle 1) strong link with r7c2
=> r8c7 (cycle 2) strong link with r8c1
=> r7c7 (cycle 1) strong link with r8c7
=> r3c8 (cycle 1) only cell in box 3 can be, because of r1c2

4

Twins Construction Example

=> r1c8 (cycle 2) strong link with r3c8

=> r2c6 (cycle 1) only cell in box 2 can be, because of r1c2 and r3c8

=> r3c6 (cycle 2) only cell in box 2 can be, because of r1c8 and r2c6

=> r2c1 (cycle 2) only cell in box 1 can be, because of r1c8 and r3c6.

L-Twins 5 starting from r3c2

Starting from r3c2 (cycle 1) (blue), I can finish Twins in every boxes. Twins do not change their cells, even though two cells change from cycle to cycle and one cell changes because the

starting cell changes of course. See image above.

Note:Twins change only in boxes 1 and 2.

This is Locked – Twins in column 2, cells r13c2, so cell r7c2 (only cell outside box 1 on column 2) does not contain candidate.

Therefore r8c1 = 5 => r7c7 = 5 => r2c6 = 5, because r1c28 and r3c28 become X-Wing.

Finally, the game needs simple techniques such as locked candidates and single digit to solve.

The game is solved.