Dutch Flat Mates: Mod 10 Killed – Full Solution Guide

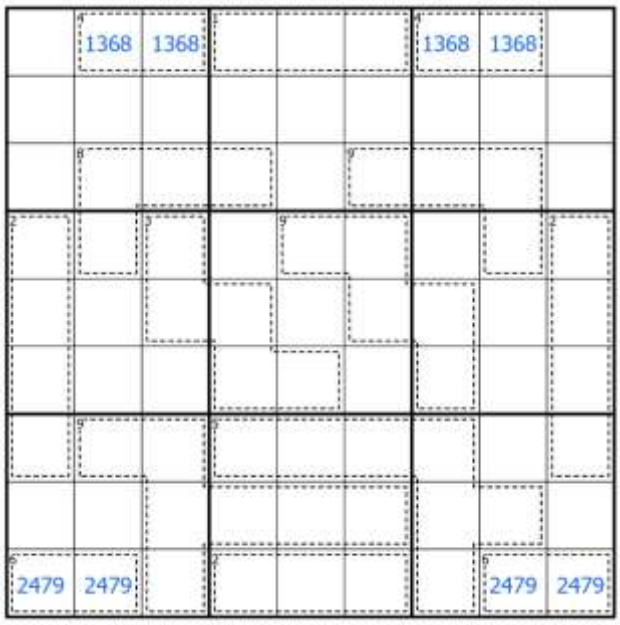
This is a full solution guide to my puzzle *Dutch Flat Mates: Mod 10 Killer*, and so spoilers are ahead.

Rules

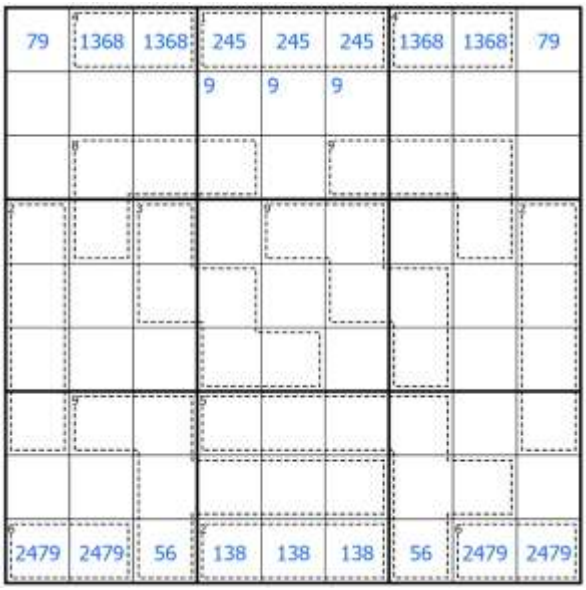
- Normal sudoku rules apply: Place the digits 1 to 9 once each in every row, column, and 3x3 box
- **Dutch Flats**: All 5s in the grid must have a 1 above or a 9 below. It may have both but it doesn't need both
- **Mod 10 Killer**: Digits may not repeat in a cage. The sum of the digits in the cage is the cage total, and the units digit of the cage total is shown in the corner of the cage. For example, a cage indicated with a 6 could sum to 6, 16, 26 or 36

Solve Path

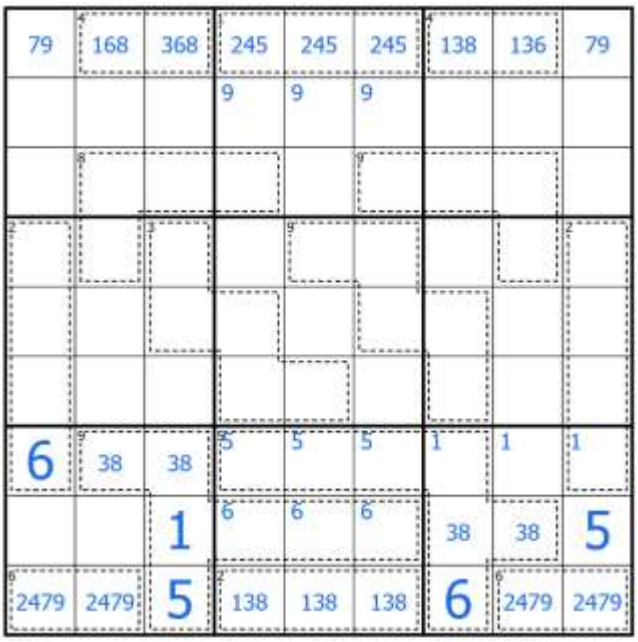
- Consider the domino cages in row 1. 4 cage sums to 4 as 1-3, 14 as 5-9, or 14 as 6-8
- However, 5 in row 1 must have a 9 below by flatmates, so this removed the 5-9 option
- Giving 1368 quad in row 1
- Similarly, the domino 6 cages in row 9 can only be 2-4 or 7-9 as 1-5 would place another 1 into the box by flatmates



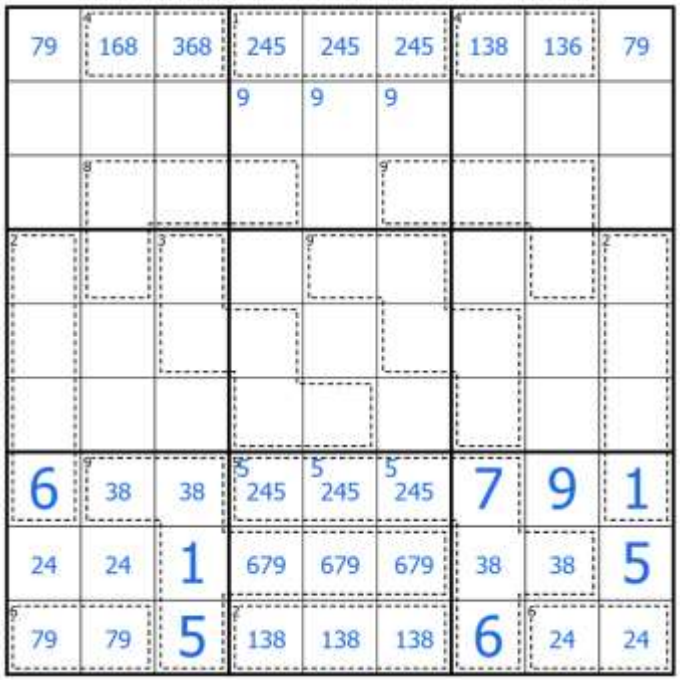
- Three cell cages in row 1 sums to 11 or 21. 21 could only be 5-7-9 as the 8 is already taken, but 5-7-9 would place another 9 in the box by flatmates
- Hence this can only sum to 11, and must be minimised as 245
- Cornermarks 9 in row 2
- Similarly, the 2 cage in row 9 sums to 12 or 22. 22 is impossible as the 9 is taken, so this sums to 12
- Options are 1-5-6 or 1-3-8, but 1-5-6 is impossible by flatmates as it would put another 1 in the box
- Leaves 56 pair in row 9, and 79 pair in row 1



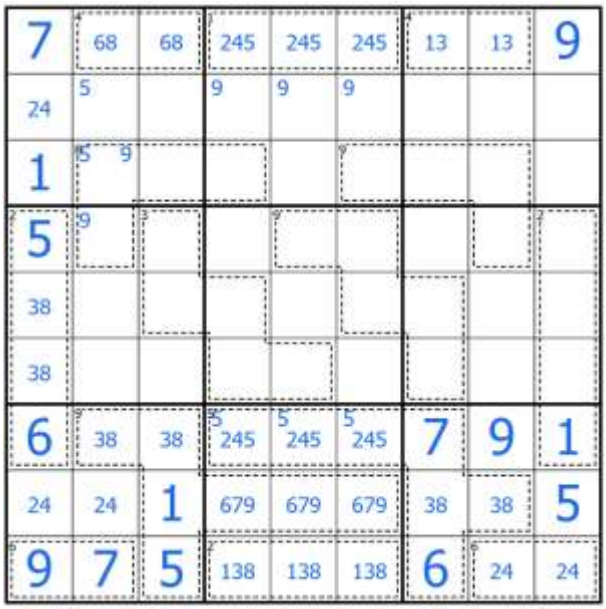
- Where is 5 in box 8? By flatmates it can't be in row 8 as this can't have a 9 below or a 1 above, so 5 is in row 7 but we don't know yet whether it has a 1 above or a 9 below
- Resolves the 56 pair by no repeats in a killer cage
- By cage geometry, R7C12 and R8C78 are 38 pairs
- 6 is placed in row 7
- 5 is placed in row 8



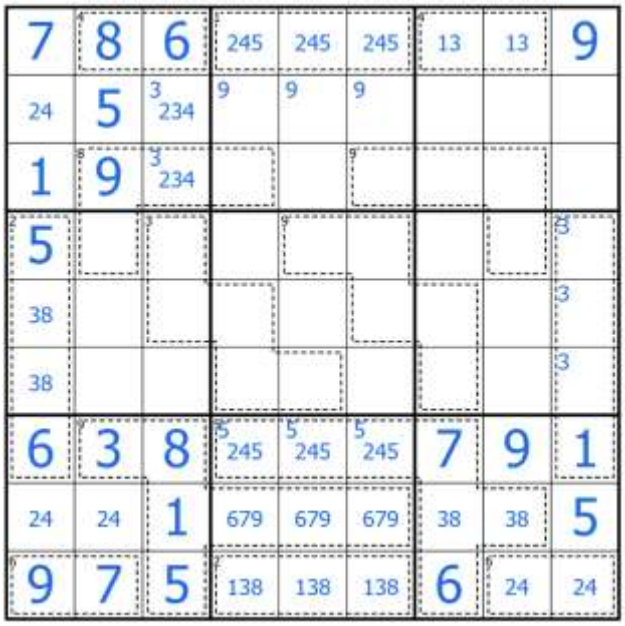
- 7 cell 5 cage can only sum to 35, which means it is missing two digits which sum to 10. It already contains 3, 6 and 8 so it must be missing 1-9, and also must contains 2-4-5-7
- Leaves a 19 pair in row 7 which is resolved by flatmates
- Resolves the 6 cage in box 9 as 2-4, the 6 cage in box 7 as 7-9, and leaves only 7 for R7C7
- Leaves 679 triple in box 8, which does indeed make a sum to 39 in the cage



- 79 pair in C1 means that the 5 in C1 must have a 1 above
- Can C1 2 cage be 1236 to sum to 12? No, as this would orphan the 5
- So it must sum to 22, and as 679 are taken, the remaining 16 can only be made using 3-5-8
- By flatmates the 5 must be at the top of the cage with a 1 above
- Confirms a 6-8 cage in box 1, and a 1-3 cage in box 3
- Can cornermark 5 into C2, and in either position it must have a 9 below

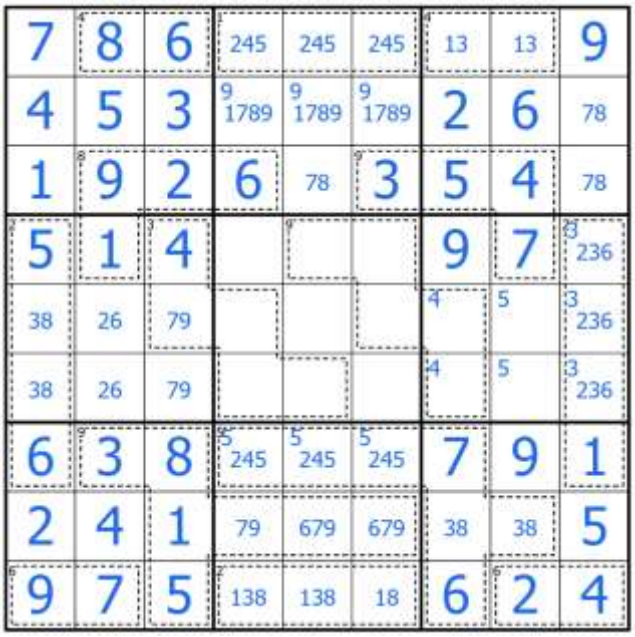


- Either: 5 in R3C2 puts 9 below. Means the remaining two cells sum to 4 or 14, but 1-3, 5-9, 6-8 are all ruled out for different reasons
- Or: 9 in R4C2 with the 9 in box 2 would leave nowhere to place 9 in box 1
- Makes R2C2 a 5 with a 9 below, and leaves a 234 triple
- The 3 in box 1 looks down and resolves 38 in box 7

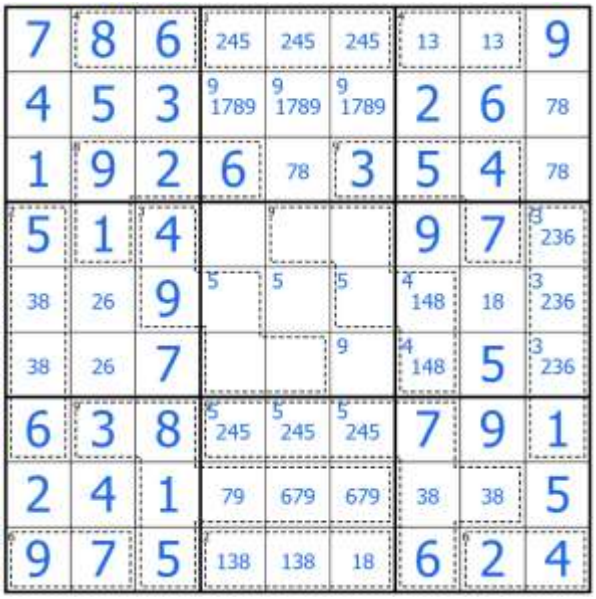


- 5 in box 3 is limited to 2 places. It must have a 9 below in either place, so 5 is placed in R3C7 and has a 9 below
- 3 in C9 is forced into the 2 cage. As this cage contains 1 and 3, it can't sum to 22, so it sums to 12
- Only valid fill is 1-2-3-6
- Leaves 78 pair for box 3
- Resolves the 2-4 in box 9
- Places 2 in box 3, then 4 in box 3, then 6 in box 3

- 4 cell 8 cage contains a 2, so it doesn't sum to 28. Hence it sums to 18 and the other two cells sum to 7
- Only 1-6 in a specific order is valid
- 4 cell 9 cage contains 4-5 which already sums to 9. Remaining two cells sum to 10, and by available digits can only be 3-7 in a specific order
- Leaves R4C3 to be a 4, and can mark pairs in box 4



- 5 in box 6 must go in R6C8 to have a valid flatmate
- Allows us to cornermark 5 in box 5, and this can only have a 9 below
- Resolves the 79 pair in box 4
- By killer geometry leaves only one spot for 9 in box 6



- Places the 5 in box 5, and then the 4 in box 5 and 6
- Leaves 18 pair in box 6

7	8	6	245	25	24	13	13	9
4	5	3	1789	1789	178	2	6	78
1	9	2	6	78	3	5	4	78
5	1	4				9	7	236
38	26	9		4	5	18	18	236
38	26	7			9	4	5	236
6	3	8	245	25	24	7	9	1
2	4	1	79	679	67	38	38	5
9	7	5	138	138	18	6	2	4

- Places 3 in row 5, then 7

7	8	6	4	5	2	13	13	9
4	5	3	18	9	178	2	6	78
1	9	2	6	78	3	5	4	78
5	1	4				9	7	236
3	26	9	7	4	5	18	18	26
8	26	7			9	4	5	236
6	3	8	5	2	4	7	9	1
2	4	1	9	67	67	38	38	5
9	7	5	138	138	18	6	2	4

- 5 cell 3 cage sums to 23 or 33. 33 requires two digits that sum to 13, but 4-9, 5-8, 6-7 all unavailable, so must be a 1-2 pair
- Resolves almost all the remaining digits in box 4 and 6

7	8	6	4	5	2	13	13	9
4	5	3	18	9	178	2	6	78
1	9	2	6	78	3	5	4	78
5	1	4	38	368	68	9	7	2
3	2	9	7	4	5	18	18	6
8	6	7	2	1	9	4	5	3
6	3	8	5	2	4	7	9	1
2	4	1	9	67	67	38	38	5
9	7	5	138	38	18	6	2	4

- 5 cell 9 cage sums to 19 or 29. Currently contains 4 and 5 so the remaining digits sum to 10 or 20
- From available digits, only 10 = 1-3-6 is available
- Sudoku to finish

7	8	6	4	5	2	3	1	9
4	5	3	1	9	8	2	6	7
1	9	2	6	7	3	5	4	8
5	1	4	8	3	6	9	7	2
3	2	9	7	4	5	1	8	6
8	6	7	2	1	9	4	5	3
6	3	8	5	2	4	7	9	1
2	4	1	9	6	7	8	3	5
9	7	5	3	8	1	6	2	4