Coordinate Coordinate Arrows Arrows– Full Solution Guide

This is a full solution guide to my puzzle *Coordinate Coordinate Arrows Arrows*, 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
- **Doublers**: 9 cells in the grid are doublers, one in every row, column, and 3x3 box, each containing a different digit. The value of a doubler cell is double the digit in that cell
- **Coordinate Arrows**: Values on an arrow spell the coordinates for the value that is their sum. The row value is on the start of the arrow and the column value on the tip. For example if an arrow contained the values 15, then a 6 (or a doubled 3) is placed in R1C5. Each arrow indicates a different cell

Solve Path

- Meta: if 9 goes on an arrow, it will create a sum that is greater than 9 and so the coordinate for that arrow must contain a doubler
- 9 goes on an arrow in box 6 and box 8. As there is only one doubler per row and column, the coordinate for the arrows containing a 9 must coordinate to the doubler in row 9 and column 9
- Where is the doubler in column 9? R3C9 can't be double 6, R5C9 can't be double 7, R7C9 can't be double 8 due to presence of arrows in those cells. Hence only R1C9 = double 5 remains
- Where is the doubler in row 9? R9C1 can't be a second double 5, R9C3, R9C5 are ruled out by the presence of arrows, so R9C7 is double 8
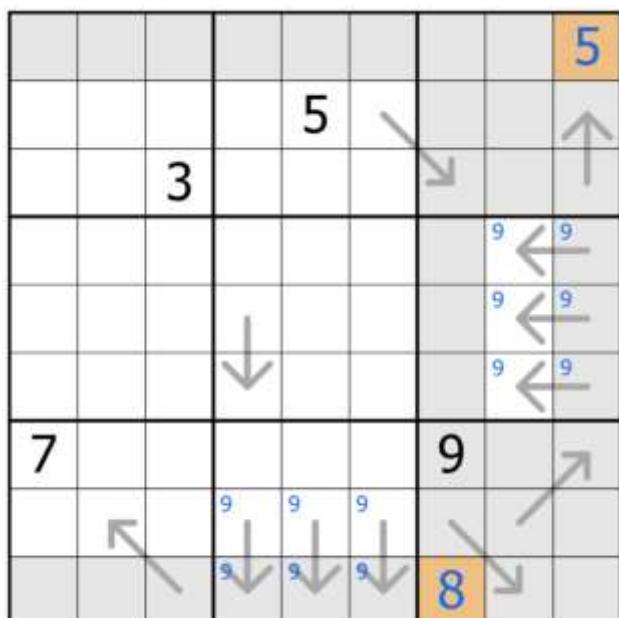
- If 9 goes in R456C8 then this would put a 9 on the arrow in box 3, creating a third arrow containing a 9, hence R456C9 is a 9
- This means that the coordinate for this arrow is the doubler in row 9, hence this must pair with a 7 in C8
- 8 must go on an arrow in box 6. This could pair with a 1 to place a 9 in R1C8/R8C1, or it could pair with a higher digit and place a doubler into row 8 or column 8
- R8C2, R8C4, R8C6, R4C8, R6C8 are all ruled out due to the presence of arrows. R2C8 is ruled out as box 3 has a doubler already
- Hence 8 in box 6 is paired with a 1
- If 8 goes in R456C8 then a second 8 is placed on an arrow in box 3, and this would result in two 1s in column 9. So 8 is in R456C9 and a 1 is in R456C8
- 9 is thus placed into R8C1 by coordinates
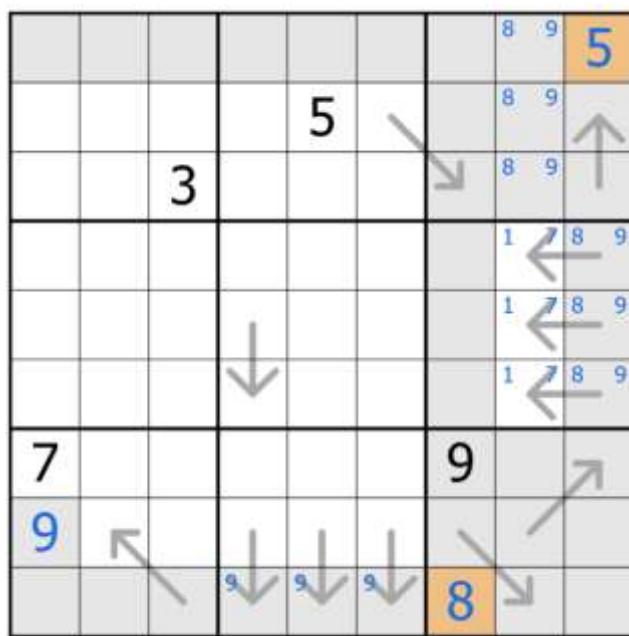
- The 9 in box 8 must indicate the doubler in column 9, and thus is paired with a 1
- Where is 7 in box 8? It must go on an arrow. It can't pair with a 1 as this is taken. It can't pair with a 2 as 9 can't go in R7C2 or R2C7. It can't go with a 3, as double 5 is taken, so it must pair with a 5.
- This has to indicate R7C5 as box 6 already has a doubler, placing double 6 in box 8
- R8C23 consists of an 8 and a doubler

- What is the doubler in box 6? It has to be a valid coordinate, so only 1 to 4 are possible. 1 is already taken in the box, double 4 creates the same problems as placing another 8 on an arrow in that we can't pair with a 1 or place another doubler into row 8 or column 8, hence only double 2 or double 3 are possible
- Double 3 places a digit into column 6. This can't pair with a 1. Pairing with a 2 would place 8 into R2C6 which would create another 81 arrow. This can't pair with another 3 to place 9 in R3C6. This can't pair with 4 or 6 as double 5 and double 6 are taken, hence only 2 works as a possible doubler in box 6
- The doubled 2 pairs with 3 or 4 to place 7 in R3C4 or 8 in R4C4
- 5 and 6 in box 6 point into box 9
- 1 and 7 are placed in box 9
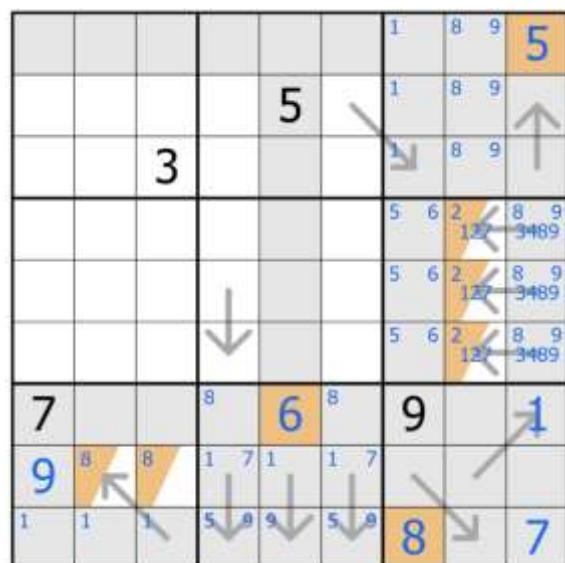
- R8C23 are 8 and a doubler, and this doubler is only 3 or 4 by sudoku/disjoint on doublers
- Hence 5 and 6 are placed in row 8
- By coordinates, either 6 or doubled 3 is placed in R5C1

- 2 is placed in box 9, on an arrow
- R9C8 can't be 3, as 5 isn't valid in R2C3, hence this is 4, and either 6 or doubled 3 is placed in R2C4

- Arrow in box 3 is from 234. 24 is invalid as we have an arrow with this coordinate already. 23 would place a 5 in R2C3 which is invalid. Hence this arrow can only be 42
- This places 6 or doubled 3 in R4C2. Hence box 4 contains both a 6 and a doubled 3
- This makes R2C4 a 6
- The doubler in box 4 is a 3, so the doubler in box 7 is a 4
- Box 6 is reduced to triples

- Box 6 arrow is now 3 and doubled 2, placing a 7 in R3C4
- Leaves only one option for the 75 arrow in box 8
- Remaining arrow in box 8 is 32, placing 5 in R3C2
- R8C2 is either 8 or doubled 4, either way it must pair with a 1 and places 9 in R1C8

- Row 3 needs a doubler, The only valid option is doubled 9 in R3C6
- Box 5 needs a doubler, the only valid option is doubled 1, which resolves the arrows in box 8
- Leaves 7 to be the doubler in box 1
- Sudoku creates some pairs and bivalues

- There is only one option for the doubler in C1, which is a 3, resolving 36 pairs
- The arrow in C4 can't contain a 9, so this is 5 and doubled 1
- Resolves the arrows in box 6

- Box 5 arrow places 7 in R5C2
- Resolves the 7 and 4 doublers in boxes 1 and 7
- Much sudoku follows

- By sudoku most of the grid resolves leaving only a few bivalues behind

- Resolved by the 11 arrow in R2/3 placing a 2 in R1C1