

My thermometers are melting! – Full Solution Guide

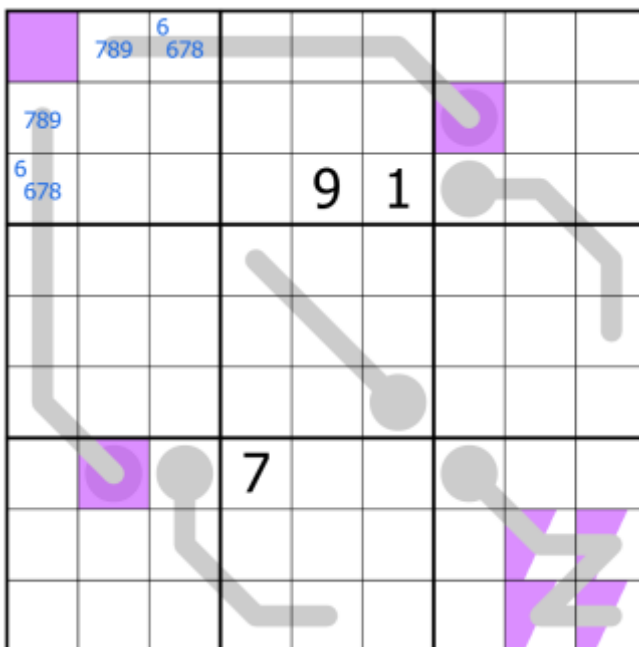
This is a full solution guide to my puzzle *My thermometers are melting!*, and so spoilers are ahead.

Rules

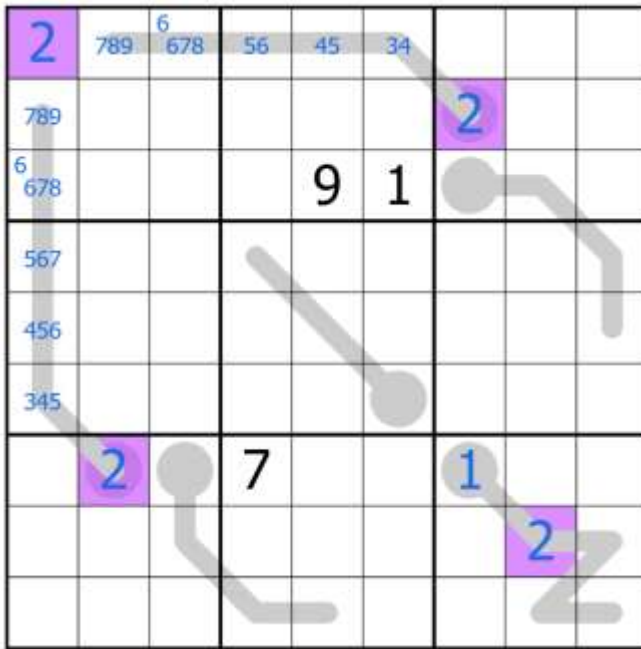
- Normal sudoku rules apply: Place the digits 1 to 9 once each in every row, column, and 3x3 box
- Thermometers: Digits along a grey thermometer strictly increase from the bulb end

Solve Path

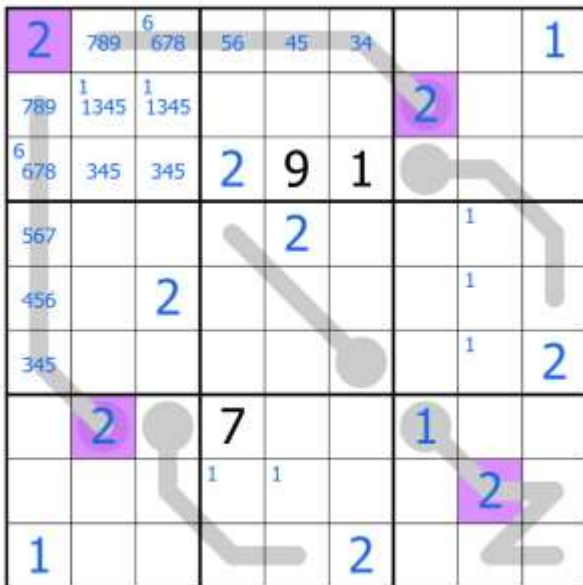
- Where is R2C7 in row 1? It can't go in its own box, or on its own thermometer, so it must be in R1C1
- Where is R7C2 in column 1? By similar logic, it is R1C1
- Hence R2C7 = R7C2 and is placed on the thermometer in box 9
- There are 4 cells on a thermometer in box 1



- R2C7 must be at least 2 by the thermometer in box 9
- One of R3C1 or R1C3 is at most 6
- Hence by thermometer logic R2C7 = 2, and this is placed in R8C8, and R7C7 is 1



- R3C7 and R7C3 bulbs are at least 3
- Hence can place 2 in box 6, 8, and then all other boxes
- Pointing 1s in box 6 and 8, places 1 in R1C9, R9C1
- 1345 quad in box 1



- There can only be one more 345 in row 3, so R3C8 is at least 6
- R4C9 is thus from 78, R5C9 from 89

2	789	6	56	45	34			1
89	1	1		7	7	2		
6	678	345	345	2	9	1	3456	67
567				2			1	78
456		2					1	89
345							1	2
	2		7			1		
			1	1			2	
1				2				

- Where are R4C9 in row 3? They can't go on their own thermometer, and by candidates only R3C1, R3C5 are viable
- Hence R5C9 is 9
- R3C1 is the same digit as R4C9, and is thus from 78
- Places 6 in box 1, and flows down the thermos in row 1

2	78	6	5	4	3	789	789	1
9	1	1	68	7	7	2	345	345
78	345	345	2	9	1	3456	67	
567			689	2			1	78
456		2		5678			1	9
345				4567			1	2
	2		7			1		
			1	1			2	
1				2				

- Pencilmarking the R7C3 thermo shows that R9C4 can only be 6, resolving digits in column 4 and leaving a 134 triple
- R9C5 hence 8
- 345 triple in column 3, making R2C3 a 1
- Leaves 789 triple in column 3

2	78	6	5	4	3	789	789	1
9	345	1	8	67	67	2	345	345
78	345	345	2	9	1	3456	67	
567		8 78	9	2			1	78
456		2	134	567			1	9
345		8 789	134		456		1	2
	2	34	7			1		
		45	1 134	1			2	
1		79	6	8	2			

- 78 pair in row 4 places 8 in box 5
- Pointing 7 in box 5 resolved 67 in box 2
- Pencilmarking box 8 and 9 reveals a 1345 quad in row 8, placing 9 in box 8 then box 9
- Leaves 678 triple in row 8, 68 pair in row 7

2	78	6	5	4	3	9	78	1
9	345	1	8	6	7	2	345	345
78	345	345	2	9	1	3456	67	
56		8 78	9	2	6 456		1	78
45		2	134	7 57	8		1	9
34		8 789	134	7 1357	6 456		1	2
	2	34	7	35	45	1	9	
678	678	45	1 134	1 135	9	678	2	34
1	9	9 79	6	8	2		45	57

- 678 triple in box 7 makes R9C3 a 9, placing 9 in box 4
- Pointing 5s in box 9 creates a 34 pair in box 7, placing 5 in R8C3
- No further basic sudoku appears to be available so now choose from:
 - Colour 78 (yellow/cyan) pairs to show that R4C9 = R8C2 = R9C7
 - X-wing of 8s in rows 3 and 7 (red)
 - Making R3C9 a 6 forces R4C9 to be 8, breaking R7C9
- Regardless R4C9 is 7, R7C9 is 6

2	78	6	5	4	3	9	78	1
9	345	1	8	6	7	2	345	345
78	345	34	2	9	1	3456	67	345678
5	16	78	9	2	⁶ ₄₆	³	¹ ₃	78
4	16	2	3	⁷ ₅₇	8		¹	9
3	9	78	14	⁷ ₁₅₇	⁶ ₄₅₆		¹	2
⁶⁸	2	³⁴	7	35	45	1	9	⁶⁸
678	78	5	¹ ₁₄	¹ ₁₃	9	68	2	34
1	34	9	6	8	2	⁵ ₃₄₅₇	⁵ ₄₅	⁵ ₅₇

- Sudoku to finish

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