


Sudoku Solver

$$\boxed{3 \times 3} \rightarrow 9 \text{ notr}$$

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| 3 | . | 6 | 5 | 7 | 8 | - | 9 | 2 |
| 5 | 2 | 9 | 1 | 3 | 4 | 7 | 6 | 8 |
| 4 | 8 | - | 6 | 2 | 9 | 5 | 3 | 1 |
| 2 | 6 | 3 | 4 | 1 | 5 | 9 | 8 | 7 |
| 9 | 7 | 4 | 8 | 6 | 3 | 1 | 2 | 5 |
| 8 | 5 | 1 | 7 | 9 | 2 | 6 | 4 | 3 |
| 1 | 3 | 8 | 9 | 4 | 7 | 2 | 5 | 6 |
| 6 | 9 | 2 | 3 | 5 | - | 8 | 7 | 4 |
| 7 | 4 | 5 | 2 | 8 | 6 | 3 | 1 | 9 |

Sudoku

A hand-drawn red square outline on a grid background.

$i/p \rightarrow g \times g \rightarrow \text{Puzzle}$

Valid solution

② → 1 col → 1-9 → exactly 12

→ approach:-

1 → 9



| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3 | • | 6 | 5 | 7 | 8 | • | 9 | 2 |
| 5 | 2 | 9 | 1 | 3 | 4 | 7 | 6 | 8 |
| 4 | 8 | • | 6 | 2 | 9 | 5 | 3 | 1 |
| 2 | 6 | 3 | 4 | 1 | 5 | 9 | 8 | 7 |
| 9 | 7 | 4 | 8 | 6 | 3 | 1 | 2 | 5 |
| 8 | 5 | 1 | 7 | 9 | 2 | 6 | 4 | 3 |
| 1 | 3 | 8 | 9 | 4 | 7 | 2 | 5 | 6 |
| 6 | 9 | 2 | 3 | 5 | • | 8 | 7 | 4 |
| 7 | 4 | 5 | 2 | 8 | 6 | 3 | 1 | 9 |

matrix

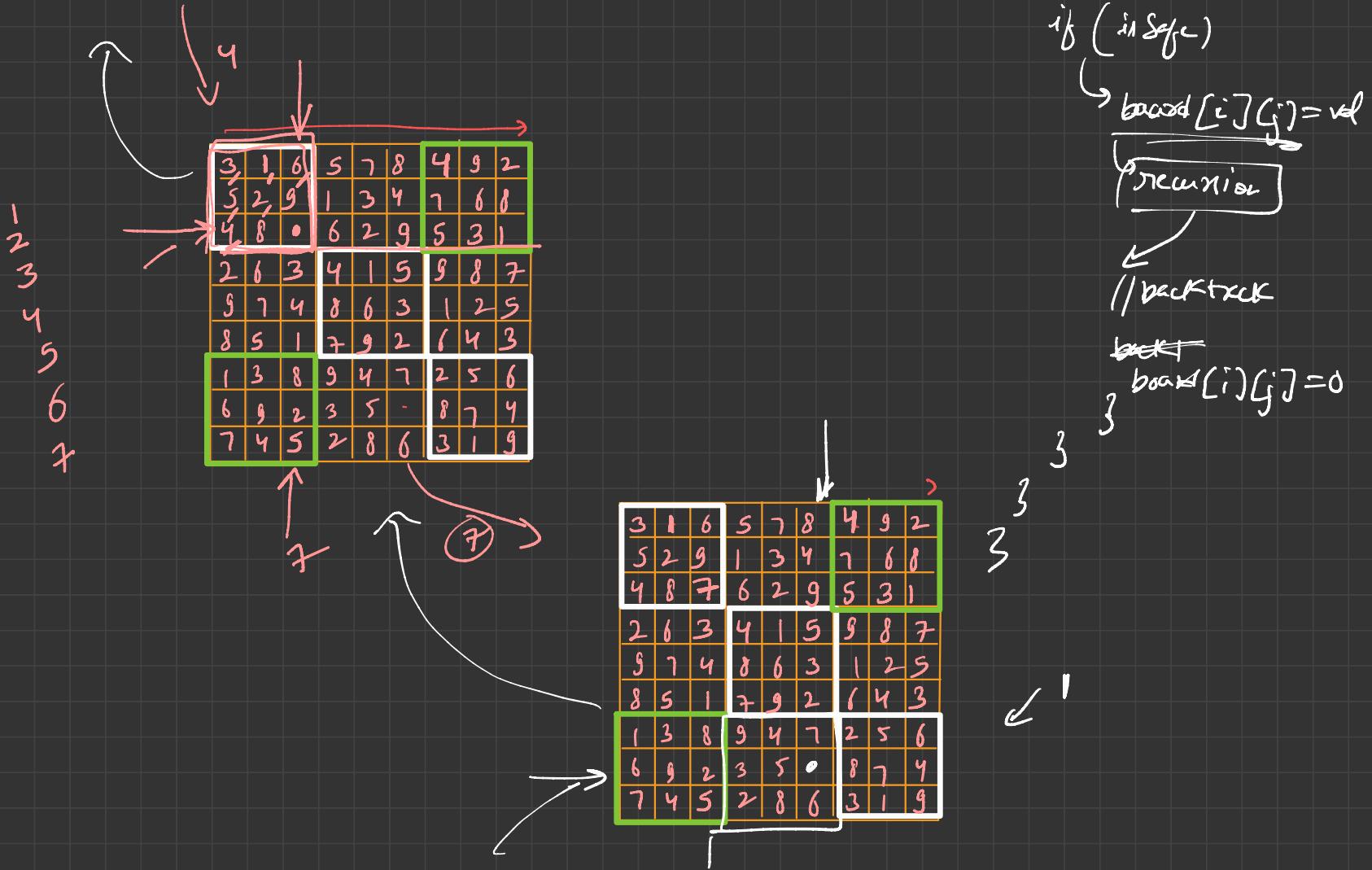
```
for ( int i = 0 → )  
{  
    for ( int j = 0 → 9 )  
    {  
        if ( cell → empty )  
            for ( int val → 1 → 9 )  
            {  
                ...  
            }  
    }  
}
```

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3 | 1 | 6 | 5 | 7 | 8 | 9 | 2 | • |
| 5 | 2 | 9 | 1 | 3 | 4 | 7 | 6 | 8 |
| 4 | 8 | • | 6 | 2 | 9 | 5 | 3 | 1 |
| 2 | 6 | 3 | 4 | 1 | 5 | 9 | 8 | 7 |
| 9 | 7 | 4 | 8 | 6 | 3 | 1 | 2 | 5 |
| 8 | 5 | 1 | 7 | 9 | 2 | 6 | 4 | 3 |
| 1 | 3 | 8 | 9 | 4 | 7 | 2 | 5 | 6 |
| 6 | 9 | 2 | 3 | 5 | • | 8 | 7 | 4 |
| 7 | 4 | 5 | 2 | 8 | 6 | 3 | 1 | 9 |

↑ ↑

value

↓

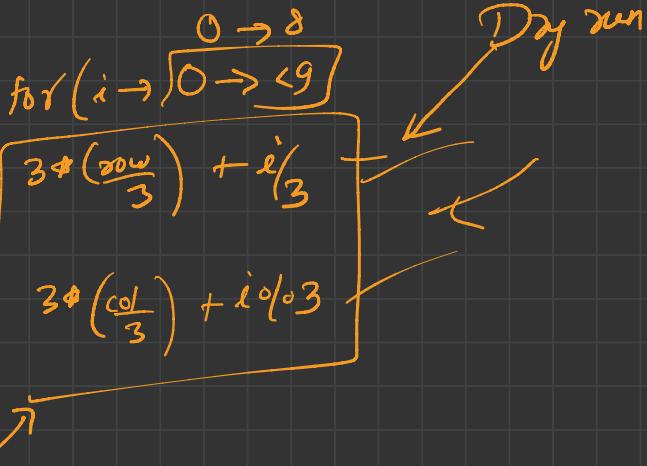


| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3 | 1 | 6 | 5 | 7 | 8 | 4 | 9 | 2 |
| 5 | 2 | 9 | 1 | 3 | 4 | 7 | 6 | 8 |
| 4 | 8 | 7 | 6 | 2 | 9 | 5 | 3 | 1 |
| 2 | 6 | 3 | 4 | 1 | 5 | 9 | 8 | 7 |
| 9 | 7 | 4 | 8 | 6 | 3 | 1 | 2 | 5 |
| 8 | 5 | 1 | 7 | 9 | 2 | 6 | 4 | 3 |
| 1 | 3 | 8 | 9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

val = 1 col = 1

row = 0 →

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | 3 | 1 | 6 | 5 | 7 | 8 | - | 9 |
| 2 | 5 | 2 | 9 | 1 | 3 | 4 | 7 | 6 |
| 3 | 4 | 8 | - | 6 | 2 | 9 | 5 | 3 |
| 4 | 2 | 6 | 3 | 4 | 1 | 5 | 9 | 8 |
| 5 | 9 | 7 | 4 | 8 | 6 | 3 | 1 | 2 |
| 6 | 8 | 5 | 1 | 7 | 9 | 2 | 6 | 4 |
| 7 | 1 | 3 | 8 | 9 | 4 | 7 | 2 | 5 |
| 8 | 6 | 9 | 2 | 3 | 5 | - | 8 | 7 |
| | 7 | 4 | 5 | 2 | 8 | 6 | 3 | 1 |



~~$i \rightarrow 0 \rightarrow$~~ $3 * \frac{0}{3} + \frac{0}{3} = 0$ $(0,0)$

$3 * \left(\frac{1}{3}\right) + 0 \% 3 = 0$

$i \rightarrow 3 \rightarrow 3 * \frac{0}{3} + \frac{2}{3} = 0 + 1 = 1$ $(1,0)$

$3 * \left(\frac{1}{3}\right) + 3 \% 3 = 0 + 0 = 0$

$i \rightarrow 1 \rightarrow 3 * \left(\frac{0}{3}\right) + \frac{1}{3} = 0 + \frac{1}{3} = 0$ $(0,1)$

$3 * \left(\frac{1}{3}\right) + 1 \% 3 = 0 + 1 = 1$

$i \rightarrow 2 \rightarrow 3 * \left(\frac{0}{3}\right) + \frac{2}{3} = 0$ $(0,2)$

$3 * \left(\frac{1}{3}\right) + 2 \% 3 = 0 + 2 = 2$

$T \cdot C \rightarrow O(g^m)$

$n \rightarrow$ no of empty cells

$S \cdot C \rightarrow O(1)$

$\underline{g \times q} \rightarrow$

