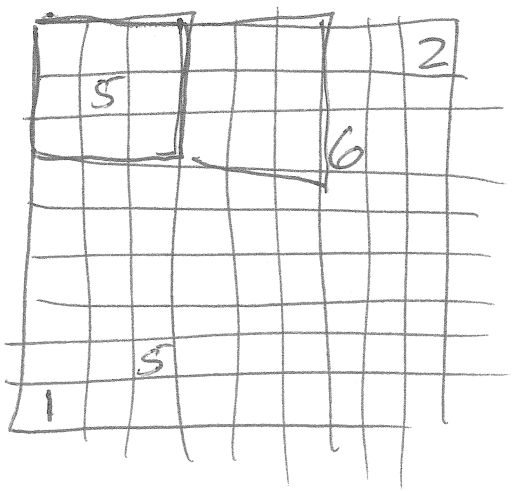
COP 3503 9/3/26

1) Show fix page layout
2) Sudoku
3) Tentaizu
4) ~~Divisibility~~ (will try to live code)
   More Divisors



every row 1-9 once
col 1-9 once
3×3 box 1-9 once

Some entries are given to you.
Goal: fill in rest.

go(k) → slot filling in
0 to 80

if slot k is forced
then go(k) → go(k+1)
else
for (int i = 1; i <= 9; i++) {
if (possible(k,i))
~~go~~ place i in slot k
tmp = go(k+1)
if (tmp) return true;
}
}

2^5 7^5 Same # Divisors

↳ better

$2^5 \cdot 3^6$ → $2^6 \times 3^5$ obviously better

NOT OPT

$2^a 3^b 5^c \ldots$

~~$a \geq b \geq c \ldots > 0$~~

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47

~~# Divisors Store min value that has that~~ many Divisors

$f[i]$

$f[6] = 12$, means 12 has 6 divisors + is smallest #

$2^5 \cdot 3^2$ ↑

32×9

288

288 18

1 2

go(long curVal, int numF, int ~~lastP~~, int lastE)

PI

Stack for Divisors

1	1
2	2
3	4
4	6
5	16
6	12

~~(5,16)~~ (6,12)

(4,6)

(3,4)

(2,2)

(1,1)

12 → 6

6 → 4

4 → 3

2 → 2

1 → 1

TreeMap

Tentacle

Options to backtrack

(1) Placing bomb put $k+1$ bombs adjacent to a square that only has k adjacent bombs.

(2) Stop @ 10 bombs

(3) If we know how many are left, if placing all bombs will leave us < 10.

(4) If I've finished all adjacent squares but the count is too small...

Divisors

Dumb BF $n > 10^{16}$ $O(n^2)$ 10^{32} for each n loop up to n counting divisors

Slightly better: for each n, go to $\sqrt{n}$ $O(n\sqrt{n})$ 10^{24}

Divisors Formula: $p_1^{a_1} p_2^{a_2} p_3^{a_3} \ldots$

$\# \text{div} = (a_1+1)(a_2+1)(a_3+1)\ldots$