808. Soup Servings

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Pour

1. Serve 100 ml of soup A & 0 ml of soup B,
2. 75 ml of A & 25 ml of B
3. 50 ml of A & 50 ml of B.
4. 25 ml of A & 75 ml of B.

	A	B
	n mls	n mls
1)	(n-100)	(n-0)
2)	(n-75)	(n-25

probability = 0.25

A → O/P
5ml → 5ml

(2). A = 0
B = 0

Probability

A
1
0
empty

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"Prob of A being empty"

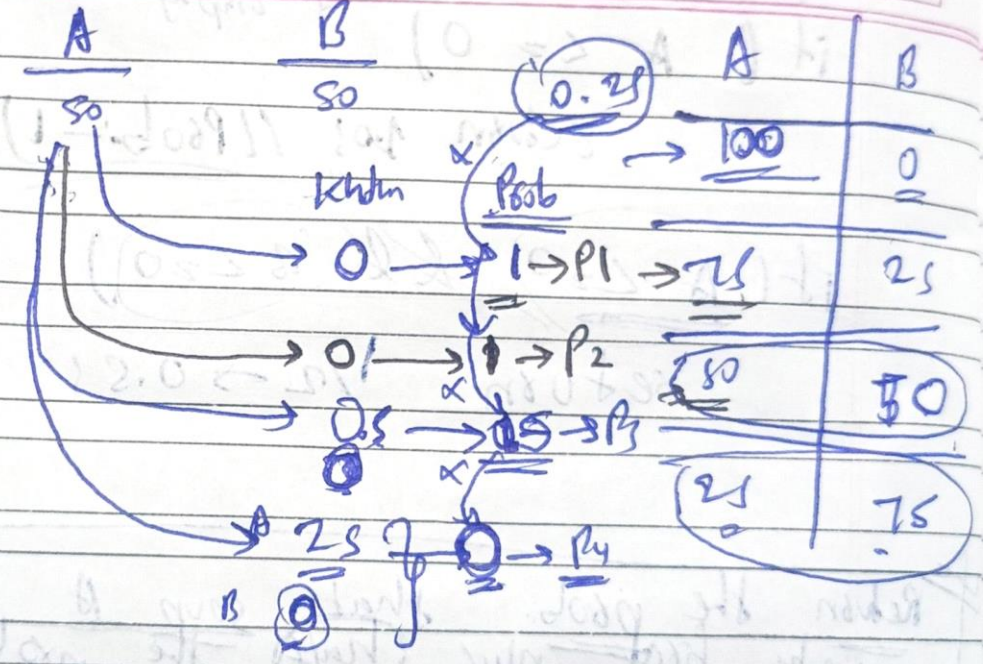
```
if ( A <= 0 )
    return 1.0; // Prob. = 1
if ( A <= 0 && B <= 0 )
    return 1/2 -> 0.5; // Prob.
```

Return the prob. that soup A will be empty first, plus the prob. that A & B become empty at the same time

// If Q2, Didn't ask about B

```
if ( B <= 0 )
    return 0.0;
```

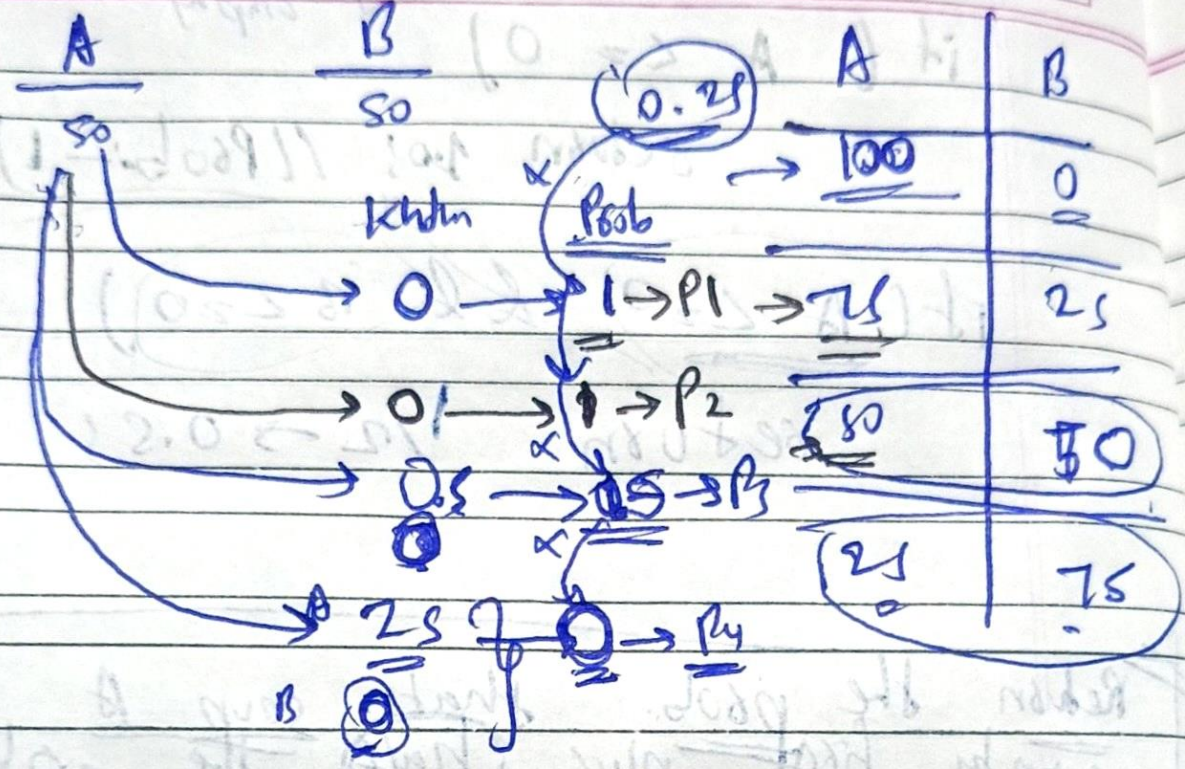
Q2. $n = 50$



$$(0.25 * P_1) + (0.25 * P_2) + (0.25 * P_3) + (0.25 * P_4)$$

$$0.25 * (P_1 + P_2 + P_3 + P_4)$$

Q2. $n = 50$



$$(0.25 * P_1) + (0.25 * P_2) + (0.25 * P_3) + (0.25 * P_4)$$

$$0.25 * (P_1 + P_2 + P_3 + P_4)$$

ops = {{100, 0}, {75, 25}, {50, 50}, {25, 75}}

Story

```
int Prob_A_empty(int A, int B){
    if (A <= 0 && B <= 0)
        return 0.5;

    if (A <= 0)
        return 1;

    if (B <= 0)
        return 0;

    prob = 0;
    for (auto &p : ops){

        int A_taken = p.first;
        int B_taken = p.second;

        prob += Prob_A_empty(A - A_taken,
                             B - B_taken);

    }
    return 0.25 * prob;
```

O(n²)

"Memoized will failed too"

N >= 5000 → return 1;

4800 safe & valid threshold

Kinky ye pehle khtam hoga B se

Naya Aim → A se 1 ?