

PROBLEM SOLVING

PLS

- ① Go through all Qs → Take that
- ② Lectures Notes → Take that
- ③ 1 VI Question → Business Oriented Question.

C₁ 25

C₂ 15

90
87

$$\frac{x_1 + x_2 + x_3 + x_4 + \dots + x_{25}}{25} = 90$$

$$\frac{y_1 + y_2 + y_3 + \dots + y_{15}}{15} = 87$$

$$\frac{x_1 + \dots + x_{25} + y_1 + \dots + y_{15}}{40} = \frac{90 \times 25 + 87 \times 15}{40}$$

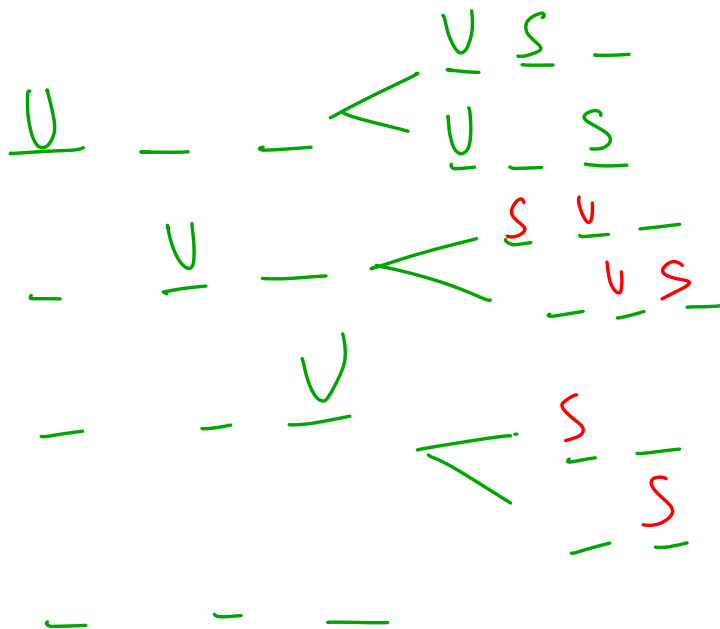
B1 10 4.5

B2 (1) 3

→ Instructor

4.36

$$\frac{4.5 + 3}{2} = 3.75$$



Total



Total

900

3 digit

①

— — —

#3, 5's

1

555

1

②

— — —

#2, 5's

26

9

5

5

9

0-9

5x

9

5

9

5

0-9

5x

8

8

5

5

0-9

0x
5x

③

— — —

#1, 5's

225

26

+1

= 27

④

— — —

#0, 5's

648

648

900 - 27 = 873

$$\begin{array}{r}
 \underline{8} \quad \underline{9} \quad \underline{9} \\
 0-9 \quad 0-9 \quad 0-9 \\
 0x \quad 5x \quad 5x \\
 5x \\
 8x \quad 9x \quad 9x
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{r}
 0-9(5x) \quad 0-9(5x) \\
 \underline{5} \quad \underline{9} \quad \underline{9} \\
 = 81
 \end{array} \\
 \begin{array}{r}
 0x \quad 5x \\
 \underline{8} \quad \underline{5} \quad \underline{9} \quad (0-9) \quad (5x) \\
 = 72
 \end{array} \\
 \begin{array}{r}
 0x \quad 5x \\
 \underline{8} \quad \underline{9} \quad \underline{5} \\
 = 72 \\
 0-9(5x) \\
 = 225
 \end{array}
 \end{array}$$

Pooled Milk test

A milk bank tests pooled sample tests of 4 people at a time.

If clean, the bank stores all of them.

if Unacceptable, then all 4 samples are tested individually,

The probability of any sample being dirty is 0.1.

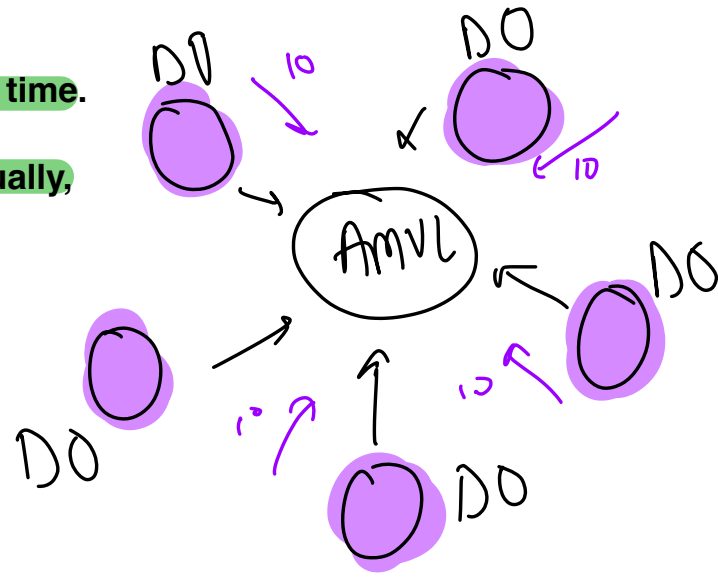
Find the expected number of tests.

AmVL → Data Scientist

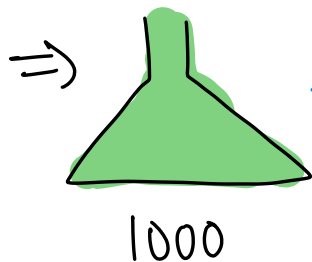
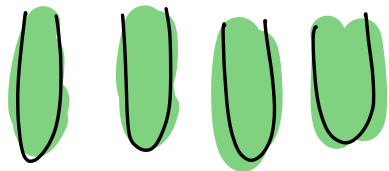
Testing cost → 1000 Rs

4000 DOs → 10 Samples → 40000 Samples

how much money we save - . → $40000 \times 1000 = 4 \text{ Cr per day}$



1000 1000 1000 1000

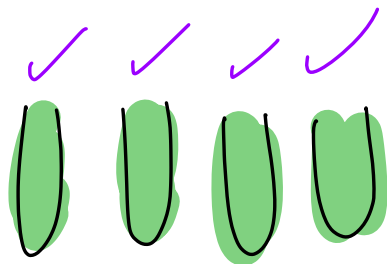


pooled sample

clean

unclean

4000



1000 1000 1000 1000

4 Samples \rightarrow 4 tests

\searrow \swarrow 1 test $\begin{cases} \text{clean} \\ \text{unclean} \end{cases}$ \times 4 tests.

X = No. of tests I need to perform.


X	$P[X]$	$p[S] = 0.1$
1	$\text{Binom pmf}(n=4, k=0, p=0.1)$	$\rightarrow 0.6561$
5	$\text{Binom pmf}(n=4, k=\frac{1}{\frac{2}{3}}, p=0.1)$ -0.3439	$1 - \text{binom pmf}(n=4, k=0, p=0.1)$

X	$P[X]$	$E[X] = \mu$
1	0.6561	
5	0.3439	

$$E[X] = \mu = 1 \times 0.6561 + 5 \times 0.3439 = 2.3756$$

Expected \rightarrow 2.3756 Test for a sample size = 4

4 \rightarrow 4000 \rightarrow 2375.6 $\Rightarrow \approx 1666$



$$40000 \times 1000 \rightarrow 4 \text{ Gr}$$

$$23756 \times 1000 \rightarrow 2.376 \text{ Gr}$$

Saved

$$\frac{1.66 \text{ Gr}}{\underline{\quad}}$$

} 605.9 Groves