Assignment - 2

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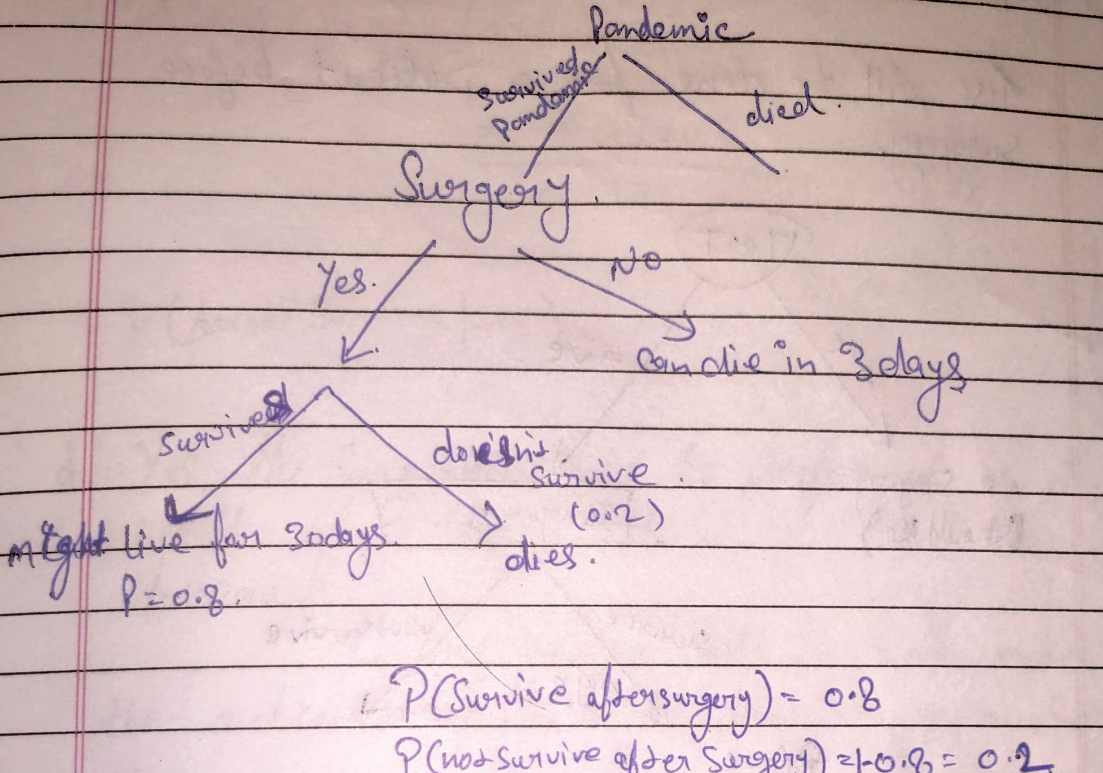


P(Survive after surgery) = 0.8

P(not survive after Surgery) = 1-0.8 = 0.2.

b) living function. L(n)

$L(30) = 1$ $\quad L(n) = mx$.

$m = \frac{1}{30}$

$L(n) = \frac{x}{30}$

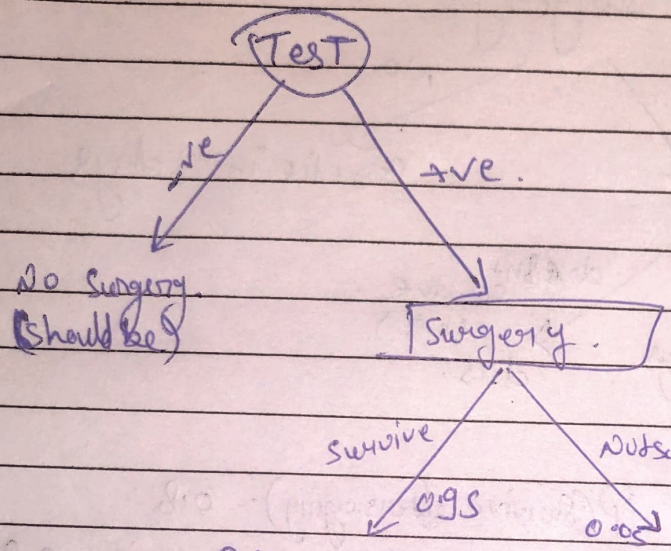
$L(30) = \frac{30}{30} = 1$

$L(0) = \frac{0}{30} = 0$

$L(3) = ?$ $\quad L(3) = \frac{3}{30} = \boxed{0.1}$

Q) A.T.Q.

Test will be done for a patient before surgery.



~~P(+ve~~

P(Survive Surgery given +ve) = 0.95.

~~P(Not Survive Surgery given +ve) =~~

~~P(Survive Surgery given -ve) = 0.05 (1-0.95)~~

P(not survive given positive) = 0.05

Find.

$$P(\text{Survive} \mid +ve) = \frac{P(+ve \mid \text{survives}) P(\text{Survive Surg})}{P(+ve)}$$

$$P(+ve) = P(+ve \mid \text{survive}) + P(+ve \mid \text{not survive})$$

$$= 0.95 \times 0.8 + 0.05 \times 0.2$$

$$= 0.77$$

P(-ve) = 0.23

~~P(survive|+ve~~

P(Survive Surgery (+ve)

$$= \frac{0.95 \times 0.8}{0.77} = \frac{0.76}{0.77}$$

$$= 0.987$$

P(does~~n't~~ survive (+ve) =

d) Yes, the Surgery should be performed if the result of the test is positive because.

The true positive rate is high means the outcome of test is true given some cases.

The false +ve Rate is too low.

$\Rightarrow$ The Surviving of the person is highly likely.

Contingency table.

TP FN = 1

FP TN = 1

1 1

0.95	0.05
0.05	0.95

$$P(\text{survives} \mid -ve) = \frac{P(-ve \mid \text{survives})\, P(\text{survives})}{P(-ve)}$$

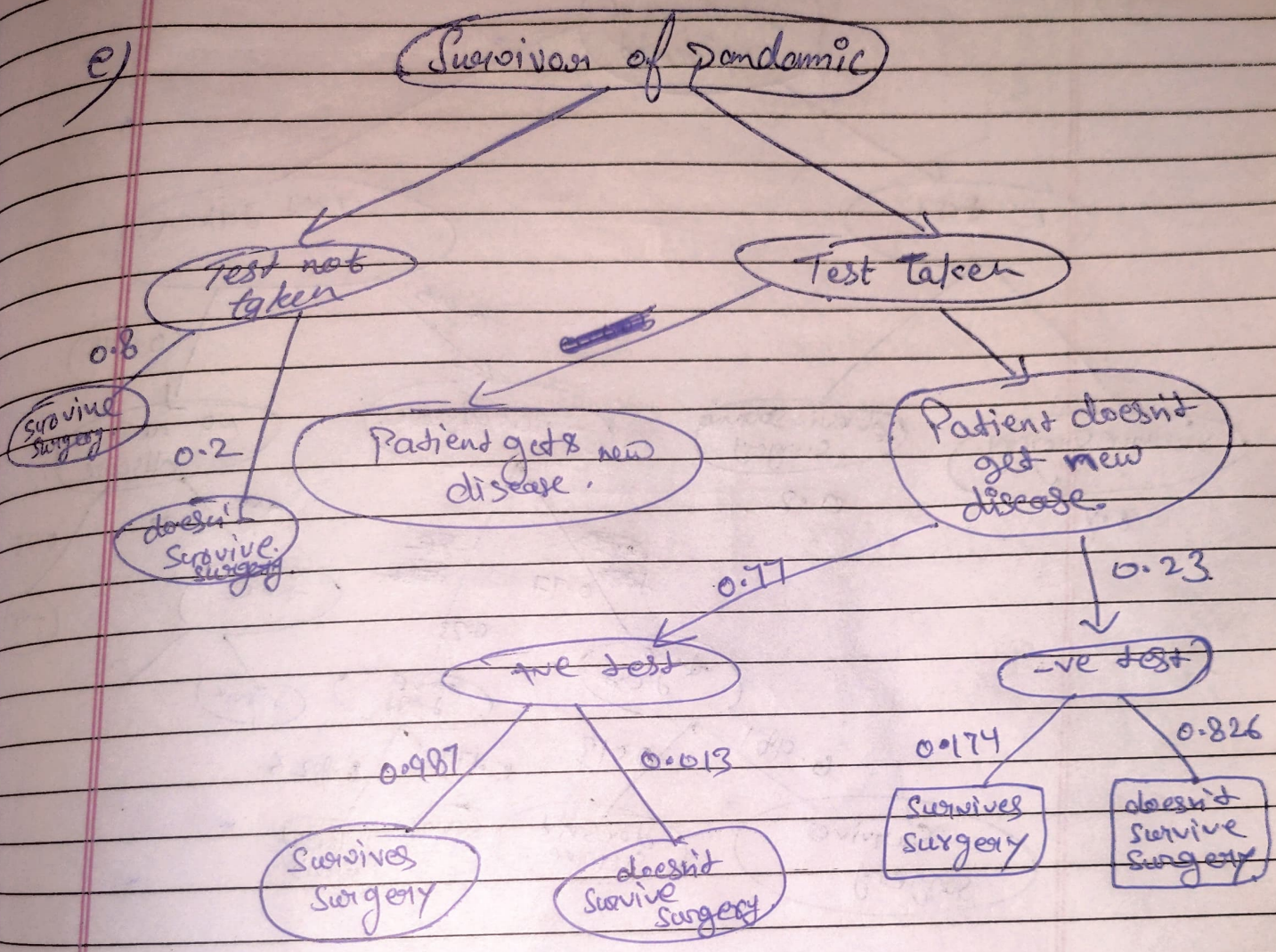
$$= \frac{0.05 \times 0.8}{0.23}$$

$$= 0.1739 \approx 0.174.$$

$$P(\text{not survive} \mid -ve) = 1 - 0.174$$

$$= 0.826$$

e)



f) Probability of new disease = 0.005 on test.

Should take the test or not.

P[survive with no disease] = 0.987 × 0.77 × 0.995 + 0.0174 × 0.23 × 0.995

= 0.796 < 0.8

P[Survive with no new disease after test taken] < P[Survive without test]

⇒ Person should not take the test.