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Week 4 Assigment

- 10% users do not close windows properly
- Windows is installed in a public library that is used by random people in a random order

1) On average, how many users of this computer

do not close windows properly before someone does
close it properly?

Page 100 failure with probobility $\Rightarrow q = 1 - p$

if $p = 10\%$ of users then

$$q = 1 - (0.1) \Rightarrow 0.9 \Rightarrow q = 0.9 \text{ or}$$

90% of user closing windows properly

10% of users do not close windows
                              properly
          or

90 of 100 close it properly

10 of 100 Do not close it properly

② <u>25 users</u> make use of windows

- How many close it properly?
- How many <u>Do not</u> close it properly?

$x = 25$, close it properly $\Rightarrow P_1 = .9$
do not close it properly $\Rightarrow P_2 = .1$

$25(.9) \Rightarrow 22.5 \Rightarrow$ at least 22 people will close it properly

$25(.1) \Rightarrow 2.5 \Rightarrow$ at least 2 people will not close it properly

3) Computer shutdowns during any month has Poisson distribution, average = 0.25 shutdowns per month.

- what is the probability of at least 3 computer shutdown in a year?

$$p(X; \lambda t) = \frac{e^{-\lambda t}(\lambda t)^{x}}{x!}$$

$\lambda = 0.25$
$t = 12$ month in a year

$$P(3; \lambda t) = \frac{e^{-(.25)(12)}[(0.25)(12)]^{3}}{3!}$$

$$P(3; 3) = \frac{e^{-3}(3)^{3}}{3!} \Rightarrow 0.2 \Rightarrow 20\% \text{ probability}$$

4) During next year, what's the probability of at least 3 months (out of 12) with exactly 1 computer shutdown each?

$$P(X; \lambda t) = \frac{e^{-\lambda t} (\lambda t)^X}{X!}$$

$X = 1$ computer shutdown

$\lambda = 0.25$ shutdown per month

$t = \frac{3 \text{ months}}{12 \text{ year}}$

$$P(1; \lambda t) = e^{-\lambda t} \lambda t$$

$$P(1; 0.06) = e^{-(0.06)} (0.06)$$

$$P(1; 0.06) = 0.06 \Rightarrow 6\% \text{ probability}$$