Ex. 2.62

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X v.a. Nº PETROLEIROS POR DIA ; $X \cap \mathcal{P}(\lambda = 2)$

Poisson	$\frac{e^{-\lambda}\lambda^x}{x!}$ $x = 0, 1, 2, \ldots$	$\lambda > 0$	λ	λ	$exp\left[\lambda\left(e^t - 1\right)\right]$

a) $P(X > 3) = 1 - P(X \leq 3) = 1 - 0.857 = 0.147$

TABELA $\begin{cases} \lambda = 2 \\ x = 3 \end{cases}$

b) K TAL QUE $P(X \leq K) \simeq 0.95$

K	$P(X \leq K)$
3	$P(X \leq 3) = 0.857$
→ 4	$P(X \leq 4) = 0.947$
5	$P(X \leq 5) = 0.983$

c) $E[X] = \lambda = 2$

d)
$$P(X=0) = (e^{-2}2^0)/0! = e^{-2}$$
$$P(X=1) = (e^{-2}2^1)/1! = 2e^{-2}$$
$$P(X=2) = (e^{-2}2^2)/2! = 2e^{-2}$$
$$P(X=3) = (e^{-2}2^3)\,3! = \frac{8}{6}e^{-2}$$
$$\vdots \qquad \vdots \qquad \vdots$$

MAIS PROVÁVEL

e) X v.a. Nº PETROLEIROS NO DIA 1

Y " " " " 2

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Teorema 7–Teorema da estabilidade da soma

Se as v.a. $X_i \quad i = 1, ..., k$ são independentes e $X_i \frown \mathcal{P}(\lambda_i)$ então

$$\sum_{i=1}^{k} X_i \frown \mathcal{P}\left(\sum_{i=1}^{k} \lambda_i\right).$$

SENDO X, Y V.A. IND. $X+Y \frown \mathcal{P}(2+2)$

$$P(X+Y=5) = \frac{e^{-4}4^5}{5!} =$$

ou $= P(X+Y \leq 5) - P(X+Y \leq 4) =$

$= .785 - .629 = 0.156$

f) Z V.A Nº PETROLEIROS ATENDIDOS

z_i :	0	1	2	3
$p_i = P(Z = z_i)$:	$P(X=0)$ $= e^{-2}$	$P(X=1)$ $= 2e^{-2}$	$P(X=2)$ $= 2e^{-2}$	$P(X \geq 3)$ $1-5e^{-2} =$

$$E[Z] = 0 \times e^{-2} + 1 \times 2e^{-2} + 2 \times 2e^{-2} + 3(1-5e^{-2})$$
$$= 5e^{-2} + 3 - 15e^{-2} = 3 - 10e^{-2} \doteq 1.646$$

g) $E[X-Z] = E[X] - E[Z] = 2 - 1.646 = 0.354$