Examen

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10° Cuatrimestre

Carrera: Tecnologías de la Información y Comunicación

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Examen Segundo Parcial de Estadistica aplicada

- Ejercicio de Poison

a) Cual es la probabilidad de que 10 computadoras sean infectadas con algun virus

$$P(10,3) = \frac{(3^{10})(2.718)^{-3}}{10!} = \frac{(59,049)(0.04980)}{10\times9\times8\times7\times6\times5\times4\times3\times2\times1}$$

$$P(10,3) = \frac{2,940.64}{3,628,800} = 0.00081$$

b) Cual es la probabilidad de que cuando mucho 1 computadora sea infectado con algun virus

$$P(0,3) = \frac{(3^{0})(2.718)^{-3}}{0!} = \frac{(1)(0.04980)}{0} = 0.0498$$

$$P(1,3) = \frac{(3)^{1}(2.718)^{-3}}{1!} = \frac{(3)(0.04980)}{1} = 0.1494$$

Sumar resultados =

$$0.04980 + 0.1494 = \underline{0.1992}$$

- Hipergeometrica

$N = 10$
$a = 4$
$n = 6$
$x = 3$

Procedimiento

$$p(3,6) = \frac{(4C3)(10-4C6-3)}{10C6} = \frac{(4)(20)}{210}$$

$$p(3,6) = \frac{80}{210} = \underline{0.380952}$$

- Geometrica

a) $X = 3$
$p = 0.05$
$q = 0.95$

$P(x=3) = (0.95)^{3-1}(0.05)$

$P(x=3) = (0.9025)(0.05)$

$P(x=3) = 0.0451$

b) $X = 7$
$p = 0.95$
$q = 0.05$

$P(x=7) = (0.05)^{7-1}(0.95)$

$P(x=7) = (0.000000015)(0.95)$

$P(x=7) = \underline{0.00000014}$

Distribucion Binomial

Ejercicio 1 - Binomial

a)

$n = 10$

$p = 0.5$

$1 - p = 0.5$

$x = 5$

$p(5) = (252)(0.5)^5 (0.5)^5$

$p(5) = (252)(0.03125)(0.03125)$

$p(5) = \underline{0.24609}$

b)

$n = 10$

$p = 0.5$

$1 - p = 0.5$

$x = 0, 1, 2, 3$

$p(0) = (10)(0.5)^0 (0.5)^{10} = 0.00976$

$p(1) = (10)(0.5)^1 (0.5)^9 = 0.00976$

$p(2) = (45)(0.5)^2 (0.5)^8 = (45)(0.25)(0.0039) = 0.04931$

$P(3) = (120)(0.5)^3 (0.5)^7 = (120)(0.125)(0.00781) = 0.1171$

$P(0, 1, 2, 3) = \underline{0.18596}$

Ejercicio 2 - Binomial

a) $n = 10$

$p = 0.25$

$q = 0.75$

$x = 0, 1, 2, 3, 4, 5$

$P(0) = (10)(0.25)^0(0.75)^{10}(252)(1)(0.0563)$

$P(0) = 0.5613$

$P(1) = (10)(0.25)^1(0.75)^9 = 0.1877$

$P(2) = (45)(0.25)^2(0.75)^8 = (45)(0.0625)(0.1001) = 0.2815$

$P(3) = (120)(0.25)^3(0.75)^7 = (120)(0.0156)(0.1334) = 0.2497$

$P(4) = (210)(0.25)^4(0.75)^6 = (210)(0.00390)(0.1779) = 0.1457$

$P(5) = (252)(0.25)^5(0.75)^5 = (252)(0.000976)(0.2373)$

$P(5) = 0.0583$