

ANDREA LIZETH PEREZ HERNANDEZ 4°B

1.- En un municipio se pretende realizar una encuesta sobre la opinión de las madres de familia sobre el sistema de salud, el cual cuenta con 45000 amas de casa, por lo tanto, entrevistar a todas sería tedioso y costoso, por lo cual se ha tomado la decisión de obtener una muestra. No existen datos anteriores para estimar el valor de P (trabájelo con un error de estimación de 3%).

2.- En un municipio se pretende realizar una encuesta sobre la opinión de las personas sobre las pláticas de higiene, el cual cuenta con 20000 amas de casa, por lo tanto, una encuesta llevada a cabo el año pasado arrojó que el 72.5% de las personas están satisfechas con este servicio. (trabájelo con un error de estimación de 5%).

Ejercicios

N= 50000 P= 76% q = B = 4% n =	N= 10000 P= q = B = 5% n =
N= 25000 P= 55% q = B = 2% n =	N= 15000 P= 66% q = B = 3% n =

Nota si no tiene valor de p entonces toma el valor de 0.5

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Ejercicio 1

$$N = 45000$$

$$P = 0.5$$

$$q = 1 - P = 1 - 0.5 = 0.5$$

$$B = 3\% = 0.03$$

$$D = \frac{B^2}{4} = \frac{(0.03)^2}{4} = 0.000225$$

$$n = \frac{N \cdot P \cdot q}{(N-1)D + P \cdot q}$$

$$n = \frac{45000 (0.5)(0.5)}{(44999)(0.000225) + (0.5)(0.5)} = 1084.36$$

$$n = 1085$$

Ejercicio 2

$$N = 20000$$

$$P = 72.5\% = 0.725$$

$$q = 1 - 0.725 = 0.275$$

$$B = 5\% = 0.05$$

$$D = \frac{B^2}{4} = \frac{(0.05)^2}{4} = 0.000625$$

$$n = \frac{N \cdot P \cdot q}{(N-1)D + P \cdot q}$$

$$n = \frac{20000 (0.725)(0.275)}{19999 (0.000625) + 0.725(0.275)} = 314.00$$

$$n = 314$$

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Ejercicio 3

$$N = 50000$$

$$P = 76\% = 0.76$$

$$q = 1 - P = 1 - 0.76 = 0.24$$

$$B = 4\% = 0.04$$

$$n = \frac{N \cdot p \cdot q}{(N-1)D + p \cdot q}$$

$$D = \frac{B^2}{4}$$

$$D = \frac{(0.04)^2}{4} = 0.0004$$

$$n = \frac{50000 (0.76)(0.24)}{49999 (0.0004) + (0.76)(0.24)} = 451.88$$

$$n = \underline{452}$$

Ejercicio 4

$$N = 10000$$

$$P = 0.5$$

$$q = 1 - P = 1 - 0.5 = 0.5$$

$$B = 5\% = 0.05$$

$$n = \frac{N \cdot p \cdot q}{(N-1)D + p \cdot q}$$

$$D = \frac{B^2}{4}$$

$$D = \frac{(0.05)^2}{4} = 0.000625$$

$$n = \frac{10000 (0.5)(0.5)}{9999 (0.000625) + (0.5)(0.5)} = 384.65$$

$$n = \underline{385}$$

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Ejercicio 5

$$N = 2500$$

$$P = 55\% = 0.55$$

$$q = 1 - P = 1 - 0.55 = 0.45$$

$$B = 2\% = 0.02$$

$$n = \frac{N \cdot P \cdot q}{(N-1)D + Pq}$$

$$D = \frac{B^2}{4}$$

$$D = \frac{(0.02)^2}{4}$$

$$D = 0.0001$$

$$n = \frac{2500(0.55)(0.45)}{24999(0.0001) + (0.55)(0.45)} = 2252.12$$

$$n = \underline{2253}$$

Ejercicio 6

$$N = 15000$$

$$P = 66\% = 0.66$$

$$q = 1 - P = 1 - 0.66 = 0.34$$

$$B = 3\% = 0.03$$

$$n = \frac{N \cdot P \cdot q}{(N-1)D + Pq}$$

$$D = \frac{B^2}{4}$$

$$D = \frac{(0.03)^2}{4}$$

$$D = 0.000225$$

$$n = \frac{15000(0.66)(0.34)}{14999(0.000225) + (0.66)(0.34)} = 935.21$$

$$n = \underline{936}$$

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$Rango = \frac{N_{\text{mayor}} - N_{\text{menor}}}{N_{\text{Intervalo}}}$ $Rango = \frac{50 - 20}{6} = \frac{30}{6}$ $Rango = 5$ ✓

Intervalo	Fi	% Fi	Fia	% Fia	\bar{X}_i	$F_i \bar{X}_i$	\bar{X}_i^2	$F_i \bar{X}_i^2$
20 - 25	3	12	3	12	22.5	67.5	506.25	1518.75
25 - 30	4	16	7	28	27.5	110	756.25	3025
30 - 35	5	20	12	48	32.5	162.5	1056.25	5281.25
35 - 40	2	8	14	56	37.5	75	1406.25	2812.5
40 - 45	4	16	18	72	42.5	120	1806.25	7275
45 - 50	7	28	25	100	47.5	322.5	2256.25	15793.75

$\sum F_i \bar{X}_i = 907.5$
 $\sum F_i \bar{X}_i^2 = 35656.25$

$Medio \bar{X} = \frac{\sum F_i \bar{X}_i}{n} = \frac{907.5}{25} = 36.3$ ✓

$Mediana = Me = Li + \frac{\frac{N}{2} - F_{i-1}}{F_i} \cdot a_i$
 $\frac{N}{2} = \frac{25}{2} = 12.5$

$Me = 35 + \frac{12.5 - 12}{5} \cdot 5 = 36.25$ ✓

$Moda Mo. Li + \frac{f_i - f_{i-1}}{f_i - f_{i-1} + f_i - f_{i+1}} \cdot a_i$
 $= \frac{49 + 7 - 4}{(7 - 4) + (7 + 0)} \cdot 5 = 46.5$ ✓

$Varianza S^2 = \frac{\sum F_i \bar{X}_i^2}{n} - \left(\frac{\sum F_i \bar{X}_i}{n} \right)^2$
 $= \frac{35656.25}{25} - \left(\frac{907.5}{25} \right)^2 = \frac{2714}{24} = 113.08$ ✓

$S = \sqrt{113.08} = 10.63$ ✓

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$$\text{Rango} = \frac{N_{\text{Mayor}} - N_{\text{Menor}}}{N_{\text{Intervalo}}} = \frac{80 - 36}{7} = \text{Rango} = 6$$

Intervalo	Fi	%Fi	FiA	%FiA	\bar{X}_i	$F_i \bar{X}_i$	\bar{X}_{12}	$F_i \bar{X}_{12}$
38 - 44	8*	22.22	8	22.22	41	328	1681	13448
44 - 50	5	13.88	13	36.11	47	235	2209	11045
50 - 56	3	8.33	16	44.44	53	159	2809	8427
56 - 62	4	11.11	20	55.55	59	236	3481	13924
62 - 68	4	11.11	24	66.66	65	260	4225	16900
68 - 74	5	13.88	29	80.55	71	355	5041	25205
74 - 80	7	19.44	36	100	77	539	5929	4503

$$\sum f_i \bar{X}_i = 2132$$

$$\sum f_i \bar{X}_{12} = 130952$$

$$\text{Mediana } \bar{X} = \frac{\sum f_i \bar{X}_i}{n} = \frac{2132}{36} = 59.22$$

$$\text{Mediana } Me = \frac{Li + \frac{n}{2} - F_{i-1}}{f_i} = \frac{56 + \frac{36}{2} - 16}{4} = 59$$

$$\frac{n}{2} = \frac{36}{2} = 18$$

$$\text{Modo } Mo = \frac{Li + f_i - f_{i-1}}{f_i - f_{i-1} - f_{i+1}} \cdot a_i = \frac{38 + 8 - 0}{(8 - 0) + (8 - 5)} \cdot 6 = \frac{42.36}{1} = 42.36$$

$$\text{Varianza } S^2 = \frac{\sum f_i \bar{X}_{12}^2}{n} - \left(\frac{\sum f_i \bar{X}_i}{n} \right)^2 = \frac{130952}{36} - \left(\frac{2132}{36} \right)^2 = 6 = 804.03$$

$$S = \sqrt{804.03} = 28.35$$