

Universidad Central del Ecuador

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Curso: 4^{to} Semestre

Datos: 20, 22, 25, 28, 29, 30, 32, 34, 35, 36, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 60, 61, 62, 63, 66, 67, 68, 69, 70, 71, 74, 76, 78, 79, 80, 82, 84, 86, 89.

#	Li	Ls	X_i	f_i	F_i	h_i	H_i	$X_i \cdot f_i$
1	20	29	24.5	5	5	0.10	0.10	122.5
2	30	39	34.5	7	12	0.14	0.24	241.5
3	40	49	44.5	10	22	0.20	0.44	445
4	50	59	54.5	9	31	0.18	0.62	490.5
5	60	69	64.5	8	39	0.16	0.78	516
6	70	79	74.5	6	45	0.12	0.90	447
7	80	89	84.5	5	50	0.10	1.00	422.5
Total				50				

Calculos
Intervalos

$$N = \sqrt{n}$$

$$N = \sqrt{50}$$

$$N = 7.07 \approx 7$$

Rango

$$R = X_{\max} - X_{\min}$$

$$R = 89 - 20$$

$$R = 69$$

Ancho de intervalo

$$A = \frac{R}{N}$$

$$A = \frac{69}{7} \approx 10$$

Datos No Agrupados

• Media aritmética

$$\bar{x} = \frac{\sum x}{n}$$

$$\bar{x} = \frac{2694}{50} \approx \bar{x} = 53.88$$

• Mediana

$$n = 50$$

$$Me = \frac{52 + 53}{2}$$

$$Me = 52.5$$

• Moda

No existe

Datos Agrupados

• Media aritmética

$$\bar{x} = \frac{\sum x_i \cdot f_i}{N}$$

$$\bar{x} = \frac{26855}{50} \approx \bar{x} = 53.70$$

• Mediana

$$Me = Li + \left(\frac{\frac{N}{2} - Fi-1}{f_i} \right) \cdot c$$

$$Me = 50 + \left(\frac{25 - 22}{9} \right) 10$$

$$Me = 50 + \left(\frac{3}{9} \right) (10)$$

$$Me = 50 + 3.33$$

$$Me = 53.33$$

• Moda

$$Mo = Li + \left(\frac{f_i - f_{i-1}}{(f_i - f_{i-1}) + (f_i - f_{i+1})} \right) \cdot c$$

$$Mo = 40 + \left(\frac{10 - 7}{(10 - 7) + (10 - 9)} \right) (10)$$

$$Mo = 40 + \left(\frac{3}{4} \right) 10$$

$$Mo = 40 + 7.5$$

$$Mo = 47.50$$

• Varianza

X_i	f_i	X_i^2	$X_i^2 \cdot f_i$
24.5	5	600.25	3001.25
34.5	7	1190.25	8331.75
44.5	10	1980.25	19802.50
54.5	9	2970.25	26732.25
64.5	8	4160.25	33282.00
74.5	6	5550.25	33301.50
84.5	5	7140.25	35701.25

$$\sum X_i^2 f_i = 160152.50$$

$$\sigma^2 = \frac{\sum X_i^2 f_i}{N} = \bar{x}^2$$

$$\sigma^2 = \frac{160152.50}{56} - (53.70)^2$$

$$\sigma^2 = 3203.05 - 2883.69$$

$$\sigma = 319.36$$

$$\sigma = \sqrt{\sigma^2}$$

$$\sigma = \sqrt{319.36} \approx \sigma = 17.87$$

Tabla 2.

Datos: 15 18 22 24 25 26 28 29 30 31 33 34 35
45 46 47 48 49 50 51 52 53 54 55 56 58
70 72 74 74 75 77 79 81 82 84

#	$2i$	$2s$	X_i	f_i	Fi	hi	Hi	$X_i \cdot f_i$
1	15	24	19.5	4	4	0.08	0.08	78
2	25	34	29.5	8	12	0.16	0.24	236
3	35	44	39.5	9	21	0.18	0.42	355.5
4	45	54	49.5	10	31	0.20	0.62	495
5	55	64	59.5	8	39	0.16	0.78	476
6	65	74	69.5	6	45	0.12	0.90	417
7	75	84	79.5	5	50	0.10	1.00	397.5
Total				50				

Calculos

$$N = \sqrt{n}$$

$$N = \sqrt{50}$$

$$N = 7$$

$$R = X_{\max} - X_{\min}$$

$$R = 84 - 15$$

$$R = 69$$

• Datos No agrupados

Media

$$\bar{x} = \frac{2462}{50}$$

$$\bar{x} = 49.24$$

Mediana

$$Me = \frac{48 + 49}{2}$$

$$Me = 74$$

A

A

Mod
Mo

• Datos agrupados

Media

$$\bar{x} = \frac{\sum x_i \cdot f_i}{N}$$

$$\bar{x} = \frac{2455}{50} \approx \bar{x} = 49.10$$

Mediana

$$Me = Li + \left(\frac{\frac{N}{2} - Fi-1}{f_i} \right) C$$

$$Me = 45 + \left(\frac{25 - 21}{10} \right) 10$$

$$Me = 45 + 4 = Me = 49$$

Moda

$$Mo = Li + \left(\frac{f_i - f_{i-1}}{(f_i - f_{i-1}) + (f_i - f_{i+1})} \right) C$$

$$Mo = 45 + \left(\frac{10 - 9}{(10 - 9) + (10 - 8)} \right) 10$$

$$Mo = 45 + \frac{1}{3} (10)$$

$$Mo = 48.33$$

• Varianza

x_i	f_i	x_i^2	$x_i^2 \cdot f_i$
19.5	4	380.25	1521
29.5	8	870.25	6962
39.5	9	1560.25	14042.25
49.5	10	2456.25	24562.50
59.5	8	3540.25	28322
69.5	6	4830.25	28981.50
79.5	5	6320.25	31601.25

$$\sum X_i^2 f_i = 135932.50$$

$$\sigma^2 = \frac{135932.50}{50} - (49.10)^2$$

$$\sigma^2 = 307.84$$

Desviación estándar

$$\sigma = \sqrt{307.84}$$

$$\sigma = 17.55$$

Tabla 3

Datos: 10, 12, 14, 16, 18, 19, 20, 22, 24, 25, 26, 27, 29, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 53, 54, 56, 58, 59, 60, 62, 64, 66, 68, 69, 70, 73, 76, 78, 79

#	L_i	L_s	X_i	f_i	F_i	h_i	H_i	$X_i \cdot f_i$
1	10	14	14.5	6	6	0.12	0.12	87
2	20	24	24.5	7	13	0.14	0.26	171.5
3	30	34	34.5	9	22	0.18	0.44	310.5
4	40	44	44.5	10	32	0.20	0.64	445
5	50	54	54.5	8	40	0.16	0.80	436
6	60	64	64.5	6	46	0.12	0.92	387
7	70	74	74.5	4	50	0.08	1.00	298

Cálculos Total 50 $R = X_{\max} - X_{\min}$

$$N = \sqrt{50}$$

$$N = 7$$

$$R = 74 - 10$$

$$R = 64$$

$$A = \frac{R}{N}$$

$$A = \frac{64}{7} \approx A = 10$$

Datos No agrupados

• Media

$$\bar{x} = \frac{2237}{50}$$

$$\bar{x} = 44.74$$

• Mediana

$$Me = \frac{42 + 43}{2}$$

$$Me = 42.5$$

• Moda

Amodal

Datos Agrupados

• Media

$$\bar{x} = \frac{\sum x_i \cdot f_i}{N}$$

$$\bar{x} = \frac{2135}{50}$$

$$\bar{x} = 42.70$$

• Mediana

$$Me = L_i + \left(\frac{\frac{N}{2} - F_{i-1}}{f_i} \right) c$$

$$Me = 40 + \left(\frac{25 - 22}{10} \right) 10$$

$$Me = 43$$

• Moda

$$Mo = L_i + \left(\frac{f_i - f_{i-1}}{(f_i - f_{i-1}) + (f_i - f_{i+1})} \right) c$$

$$Mo = 40 + \left(\frac{10 - 9}{(10 - 9) + (10 - 8)} \right) 10$$

$$Mo = 43.33$$

Varianza

x_i	f_i	x_i^2	$x_i^2 \cdot f_i$
14.5	6	210.25	1261.50
24.5	7	600.25	2401.75
34.5	9	1190.25	10712.25
44.5	10	1980.25	19802.50
54.5	8	2970.25	23762
64.5	6	4160.25	24961.50

Varianza

$$\sum X_i^2 \cdot f_i = 106902.50$$

$$\sigma^2 = \frac{106902.50}{50} - (42.70)^2$$

$$\sigma^2 = 2138.05 - 1823.29$$

$$\sigma^2 = 314.76$$

Desviación estándar

$$\sigma = \sqrt{314.76}$$

$$\sigma = 17.74$$

Tabla 4.

Datos: 25, 27, 29, 31, 34, 35, 36, 38, 39, 40, 41, 42, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 65, 66, 67, 69, 70, 71, 72, 74, 75, 77, 79, 81, 83, 84, 85, 88, 90, 94

#	Li	Lu	X_i	f_i	F_i	h_i	H_i	$X_i \cdot f_i$
1	25	34	29.5	5	5	0.10	0.10	147.5
2	35	44	39.5	8	13	0.16	0.26	316
3	45	54	49.5	10	23	0.20	0.46	495
4	55	64	59.5	9	32	0.18	0.64	535.5
5	65	74	69.5	8	40	0.16	0.80	556
6	75	84	79.5	6	46	0.12	0.92	477
7	85	94	89.5	4	50	0.08	1.00	358
Total				50				

Intervalos

Rango

Ancho de intervalo

$$N = \sqrt{50}$$

$$R = X_{\max} - X_{\min}$$

$$A = \frac{R}{N}$$

$$N = \sqrt{7}$$

$$R = 94 - 25$$

$$A = \frac{69}{7} \approx A = 10$$

$$R = 69$$

Datos No Agrupados

• Media

$$\bar{x} = \frac{\sum X}{n}$$

• Mediana

$$Me = \frac{X_{\frac{n}{2}} + X_{\frac{n}{2} + 1}}{2}$$

• Moda

A_{modal}

$$\bar{x} = \frac{3001}{50}$$

$$Me = \frac{56 + 57}{2}$$

$$\bar{x} = 60.02$$

$$Me = 56.5$$

Datos Agrupados

• Media aritmética

$$\bar{x} = \frac{\sum x_i \cdot f_i}{N}$$

• Mediana

$$Me = L_i + \left(\frac{\frac{N}{2} - F_{i-1}}{f_i} \right) c$$

$$\bar{x} = \frac{2885}{50}$$

$$Me = 55 + \left(\frac{25 - 23}{9} \right) 10$$

$$\bar{x} = 57.70$$

$$Me = 57.22$$

• Moda

$$Mo = L_i + \left(\frac{f_i - f_{i-1}}{(f_i - f_{i-1}) + (f_i - f_{i+1})} \right) c$$

$$Mo = 45 + \left(\frac{10 - 8}{(10 - 8) + (10 - 4)} \right) 10$$

$$Mo = 45 + \frac{2}{3} (10)$$

$$Mo = 51.67$$

Tabla de varianza

x_i	f_i	x_i^2	$x_i^2 \cdot f_i$
29.5	5	870.25	4351.25
34.5	8	1190.25	9522
49.5	10	2450.25	24502.5
54.5	9	2970.25	26732.25
64.5	8	4160.25	33282
79.5	6	6320.25	37921.5
89.5	4	8010.25	32041

Varianza

$$\sigma^2 = \frac{\sum x_i^2 \cdot f_i}{N} - \bar{x}^2$$

$$\sigma^2 = \frac{181802.50}{50} - (57.70)^2$$

$$\sigma^2 = 3636.05 - 3329.29$$

$$\sigma^2 = 306.76$$

Desviación estándar

$$\sigma = \sqrt{\sigma^2}$$

$$\sigma = \sqrt{306.76}$$

$$\sigma = 17.51$$

Tabla 5

Datos: 18, 20, 22, 24, 26, 28, 29, 31, 33, 35, 36, 38, 40, 41, 42, 44, 45, 46, 48, 49, 50, 52, 53, 54, 55, 58, 59, 60, 62, 63, 64, 66, 68, 69, 70, 72, 74, 75, 76, 78, 80, 84, 85, 86, 88, 90, 92, 94, 96.

#	Li	Ls	X_i	f_i	F_i	h_i	H_i	$X_i \cdot f_i$
1	18	24	22.5	7	7	0.14	0.14	164.5
2	30	41	35.5	8	15	0.16	0.30	284
3	42	53	47.5	8	23	0.16	0.46	380
4	54	65	59.5	9	32	0.18	0.64	535.5
5	66	77	71.5	8	40	0.16	0.80	572
6	78	89	83.5	7	47	0.14	0.94	584.5
7	90	101	95.5	3	50	0.06	1.00	286.5

Total
Intervalos

$$N = \sqrt{50}$$

$$N = \sqrt{7}$$

50

Rango

$$R = X_{\max} - X_{\min}$$

$$R = 96 - 18$$

$$R = 78$$

Ancho de intervalo

$$A = \frac{R}{N}$$

$$A = \frac{78}{7}$$

$$A = 12$$

Datos No Agrupados

• Media

$$\bar{X} = \frac{\sum X}{n}$$

$$\bar{X} = \frac{2921}{50}$$

$$\bar{X} = 58.42$$

• Mediana

$$Me = \frac{X_{\frac{n}{2}} + X_{\frac{n}{2} + 1}}{2}$$

$$Me = \frac{56 + 58}{2}$$

$$Me = 57$$

• Moda

Amodal

Datos Agrupados

• Media aritmética

$$\bar{x} = \frac{\sum x_i \cdot f_i}{N}$$

$$\bar{x} = \frac{2807}{50}$$

$$\bar{x} = 56.14$$

• Moda

$$M_o = L_i + \left(\frac{f_i - f_{i-1}}{(f_i - f_{i-1}) + (f_i - f_{i+1})} \right) C$$

$$M_o = 54 + \left(\frac{9 - 8}{(9 - 8) + (9 - 8)} \right) 12$$

$$M_o = 54 + \left(\frac{1}{2} \right) 12$$

$$M_o = 60$$

Tabla Varianza

x_i	f_i	x_i^2	$x_i^2 \cdot f_i$
23.5	7	552.25	3865.75
35.5	8	1260.25	10082
47.5	8	2256.25	18050
59.5	9	3540.25	31362.25
71.5	8	5112.25	40848
83.5	7	6972.25	48805.75
95.5	7	9120.25	27760.75

• Mediana

$$M_e = L_i + \left(\frac{\frac{N}{2} - F_{i-1}}{f_i} \right) C$$

$$M_e = 54 + \left(\frac{25 - 23}{9} \right) 12$$

$$M_e = 56.67$$

Varianza

$$O^2 = \frac{\sum X^2}{N} - \bar{x}^2$$

$$O^2 = \frac{180424.50}{50} - (56.14)^2$$

$$O^2 = 3618.44 - 3151.70$$

$$O^2 = 466.74$$

Desviación estándar

$$O = \sqrt{O^2}$$

$$O = \sqrt{466.74}$$

$$O = 21.61$$

Tabla 6

Datos: 30, 32, 34, 36, 38, 39, 40, 42, 44, 45, 46, 48, 49, 50, 52, 54, 55, 56, 58, 60, 61, 62, 64, 66, 68, 69, 76, 72, 74, 75, 76, 78, 86, 82, 84, 85, 86, 88, 90, 92, 94, 95, 96, 98, 100, 102, 104, 106, 108, 110,

Cálculo

Intervalos

$$N = \sqrt{n}$$

$$N = \sqrt{50}$$

$$N = \sqrt{7}$$

Rango

$$R = X_{\max} - X_{\min}$$

$$R = 110 - 30$$

$$R = 80$$

Ancho de intervalo

$$A = \frac{R}{N}$$

$$A = \frac{80}{7}$$

$$A = 12$$

#	L_i	Ls	X_i	f_i	Fi	hi	H_i	$X_i \cdot f_i$
1	30	4	35.5	7	7	0.14	0.14	248.5
2	42	53	47.5	8	15	0.16	0.30	380
3	54	65	59.5	8	23	0.16	0.46	476
4	66	77	71.5	9	32	0.18	0.64	643.5
5	78	89	83.5	8	40	0.16	0.80	668
6	90	101	95.5	7	47	0.14	0.94	668.5
7	102	113	107.5	3	50	0.06	1.00	322.5

Total 50

• Datos No Agrupados

• Media

$$\bar{X} = \frac{\sum X}{n}$$

$$\bar{X} = \frac{3524}{50}$$

$$\bar{X} = 70.48$$

• Mediana

$$Me = \frac{X_{\frac{n}{2}} + X_{\frac{n}{2} + 1}}{2}$$

$$Me = \frac{68 + 69}{2}$$

$$Me = 68.5$$

• Moda

Amodal

• Datos Agrupados

• Media Asimétrica

$$\bar{X} = \frac{\sum X_i \cdot f_i}{N}$$

$$\bar{X} = \frac{3407}{50}$$

$$\bar{X} = 68.14$$

• Mediana

$$Me = L_i + \left(\frac{\frac{N}{2} - F_{i-1}}{f_i} \right) \cdot c$$

$$Me = 66 + \left(\frac{25 - 23}{9} \right) \cdot 12$$

$$Me = 66 + 2.67 \approx Me = 68.67$$

• Moda

$$Mo = Li + \left(\frac{fi - fi-1}{(fi - fi-1) + (fi - fi+1)} \right) c$$

$$Mo = 66 + \left(\frac{4-8}{(4-8)+(4-8)} \right) 12$$

$$Mo = 66 + \left(\frac{1}{2} \right) 12$$

$$Mo = 66 + 6 \approx Mo = 72$$

• Tabla de Varianza

xi	fi	xi^2	$xi^2 \cdot fi$
35.5	7	1260.25	8821.75
47.5	8	2256.25	1850
59.5	8	3540.25	28322
71.5	9	5112.25	46010.25
83.5	8	697.25	55778
95.5	7	9120.25	63841.75
107.5	3	11556.25	34668.75

Varianza

$$\sigma^2 = \frac{\sum fi}{N} - \bar{x}^2$$

$$\sigma^2 = \frac{255492.50}{50} - (68.14)^2$$

$$\sigma = 5109.85 - 4643.06$$

$$\sigma = 466.79$$

• Desviación estándar

$$\sigma = \sqrt{\sigma^2}$$

$$\sigma = \sqrt{466.79}$$

$$\sigma = 21.61$$

Tabla 7

Datos: 12, 14, 16, 18, 20, 22, 24, 25, 27, 29, 30, 32, 34, 36, 40, 41, 43, 45, 47, 48, 50, 52, 54, 58, 60, 61, 63, 65, 66, 68, 72, 74, 76, 77, 79, 81, 83, 84, 86, 88, 90, 92, 94, 96, 98, 100, $\bar{x}$

Ancho de intervalo

Intervalo

$$R = X_{\max} - X_{\min}$$

$$R = 102 - 12$$

$$R = 90$$

$$A = \frac{P}{N}$$

$$A = \frac{90}{7}$$

$$A = 13$$

#	L _i	L _s	X _i	f _i	F _i	h _p	H _i	X _p - f _i
1	12	24	18	7	7	0.14	0.14	126
2	25	37	31	8	15	0.16	0.30	248
3	38	50	44	8	23	0.16	0.46	352
4	51	63	57	8	31	0.16	0.62	456
5	64	76	70	9	40	0.18	0.80	630
6	77	89	83	7	47	0.14	0.94	581
7	90	102	96	3	50	0.06	1.00	288
Total				50				

• Datos No Agrupados

- Media

$$\bar{x} = \frac{\sum x}{n}$$

$$\bar{x} = \frac{2835}{50}$$

$$\bar{x} = 56.70$$

- Mediana

$$Me = \frac{X_{25} + X_{26}}{2}$$

$$Me = \frac{56 + 58}{2}$$

$$Me = 57$$

- Moda

Amodal

• Datos Agrupados

- Media aritmética

$$\bar{x} = \frac{\sum x_i \cdot f_i}{N}$$

$$\bar{x} = \frac{2681}{50}$$

$$\bar{x} = 53.62$$

- Mediana

$$Me = L_i + \left(\frac{\frac{N}{2} - F_{i-1}}{f_i} \right) C$$

$$Me = 51 + \left(\frac{25 - 23}{8} \right) 13$$

$$Me = 51 + 3.25$$

$$Me = 54.25$$

• Moda

$$Mo = L_i + \left(\frac{f_i - f_{i-1}}{(f_i - f_{i-1}) + f_{i+1}} \right) C$$

$$Mo = 64 + \left(\frac{9 - 8}{(9 - 8) + (9 - 7)} \right) 13$$

$$Mo = 64 + \left(\frac{1}{3} \right) 13$$

$$Mo = 64 + 4.33$$

$$Mo = 68.33$$

• Tabla de Varianza

X_i	f_i	X_i^2	$X_i^2 \cdot f_i$
18	7	324	2268
31	8	961	7688
44	8	1936	15488
57	8	3249	25992
70	9	4900	44100
83	7	6889	48223
96	3	9216	27648

Varianza

$$\sigma^2 = \frac{\sum X_i^2 f_i}{N} - \bar{x}^2$$

$$\sigma^2 = \frac{171407}{56} - (53.62)^2$$

$$\sigma = 3428.14 - 2875.10$$

$$\sigma = 553.04$$

• Desviación estándar

$$\sigma = \sqrt{\sigma^2}$$

$$\sigma = \sqrt{553.04}$$

$$\sigma = 23.52$$

Tabla
Datos

53

82

10

10

Tabla 8

Datos: 22, 24, 26, 28, 30, 32, 34, 35, 37, 39, 40, 42, 44, 46, 48, 50, 51, 53, 55, 57, 58, 60, 62, 64, 66, 68, 69, 71, 73, 75, 76, 78, 80, 82, 84, 86, 87, 89, 91, 93, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112

Calculos

Intervalos

$$N = \sqrt{n}$$

$$N = \sqrt{50}$$

$$N = \sqrt{7}$$

Rango

$$R = X_{\max} - X_{\min}$$

$$R = 112 - 22$$

$$R = 90$$

Amplitud

$$A = \frac{R}{N}$$

$$A = \frac{90}{7}$$

$$A = 13$$

#	L_i	L_s	X_i	f_i	F_i	h_i	H_i	$X_i - L_i$
1	22	34	28	7	7	0.14	0.14	196
2	35	47	41	8	15	0.16	0.30	328
3	48	60	54	8	23	0.16	0.46	432
4	61	73	67	7	30	0.14	0.60	469
5	74	86	80	9	39	0.18	0.78	720
6	87	99	93	7	46	0.14	0.92	651
7	100	112	106	4	50	0.08	1.00	424
Total			50					

• Datos No Agrupados

- Media

$$\bar{X} = \frac{\sum X}{n}$$

$$\bar{X} = \frac{3347}{50}$$

$$\bar{X} = 66.94$$

- Mediana

$$Mp = \frac{X_{25} + X_{26}}{2}$$

$$Mp = \frac{66 + 68}{2}$$

$$Mp = 67$$

- Moda

A modal

• Datos Agrupados

- Media aritmética

$$\bar{X} = \frac{\sum X_i \cdot f_i}{N}$$

$$\bar{X} = \frac{3220}{50}$$

$$\bar{X} = 64.40$$

- Mediana

$$Mp = L_i + \left(\frac{\frac{N}{2} - F_{i-1}}{f_i} \right) C$$

$$Mp = 61 + \left(\frac{25 - 22}{7} \right) 13$$

$$Mp = 61 + 3.71$$

$$Mp = 64.71$$

- Moda

$$Mo = L_i + \left(\frac{f_i - f_{i-1}}{(f_i - f_{i-1}) + (f_i - f_{i+1})} \right) C$$

$$Mo = 74 + \left(\frac{9 - 7}{(9 - 7) + (9 - 7)} \right) 13$$

$$Mo = 74 + \left(\frac{2}{4} \right) 13$$

$$Mo = 74 + 6.5$$

$$Mo = 80.50$$

Tabla para Varianza

X_i	f_i	X_i^2	$X_i^2 \cdot f_i$
28	7	784	5488
41	8	1681	13448
54	8	2916	27328
67	7	4489	31423
80	9	6400	57600
93	7	8649	60543
106	4	11236	44944

Varianza

$$\sigma^2 = \frac{\sum X_i^2 f_i}{N} - \bar{X}^2$$

$$\sigma^2 = \frac{276774}{56} - (64.40)^2$$

$$\sigma^2 = 4735.48 - 4147.36$$

$$\sigma^2 = 588.12$$

Desviación estándar

$$\sigma = \sqrt{\sigma^2}$$

$$\sigma = \sqrt{588.12}$$

$$\sigma = 24.25$$

Universidad Central del Ecuador

Tarea Individual

Nombres: Alison Chulca

Curso: 4^{to} Semestre "A"

Fecha: 06/05/2026

Tabla 1

Datos:

12, 15, 18, 20, 22, 25, 27, 30, 32, 35, 36, 38, 40, 42, 45, 48, 50, 52, 55, 58, 60, 62, 65, 67, 70, 72, 75, 78, 80, 85

Cálculos:

$$= \sqrt{n}$$

$$R = X_{\max} - X_{\min}$$

$$= \sqrt{30}$$

$$R = 85 - 12$$

$$= \sqrt{10}$$

$$R = 73$$

$$a = \frac{73}{10}$$

$$a = 7.3 \approx 7$$

Tabla:

#	Intervalos	X_i	f_i	F_i	h_i	H_i
1	12-19	15.5	3	3	0.10	0.10
2	19-26	22.5	3	6	0.10	0.20
3	26-33	29.5	3	9	0.10	0.30
4	33-40	36.5	4	13	0.13	0.43
5	40-47	43.5	3	16	0.10	0.53
6	47-54	50.5	3	19	0.10	0.63

7	54-61	57.5	3	22	0.10	0.73
8	61-68	64.5	3	25	0.10	0.83
9	68-75	71.5	3	28	0.10	0.93
10	75-85	80	2	30	0.07	1.00
			30	30	1.00	1.00

Tabla 2

Datos:

5, 7, 9, 10, 12, 14, 15, 17, 18, 20, 22, 24, 25, 27, 29, 30, 32, 34, 35, 37, 39, 40, 42, 44, 45, 47, 49, 50, 52, 54, 55, 58.

Calculos:

$$= \sqrt{n}$$

$$R = X_{\max} - X_{\min}$$

$$= \sqrt{32}$$

$$R = 58 - 5$$

$$= \sqrt{3,2}$$

$$R = 53$$

$$a = \frac{53}{10}$$

$$a = 5$$

Tabla:

#	Intervalos	X_i	f_i	F_i	h_i	H_i
1	5 - 9	7	3	3	0.09	0.09
2	10 - 14	12	3	6	0.09	0.18
3	15 - 19	17	3	9	0.09	0.27
4	20 - 24	22	3	12	0.09	0.36
5	25 - 29	27	3	15	0.09	0.45
6	30 - 34	32	3	18	0.09	0.54
7	35 - 39	37	3	21	0.09	0.63
8	40 - 44	42	3	24	0.09	0.72
9	45 - 49	47	3	27	0.09	0.81
10	50 - 58	54	5	32	0.16	1.00
			32	32	1.00	1.00

Tabla 3:

Datos:

100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220,
 230, 240, 250, 260, 270, 280, 290, 300, 310, 320, 330, 340,
 350, 360, 370, 380, 390, 400, 410, 420, 430, 340,
 3,50

Calcular:

$$= \sqrt{n}$$

$$= \sqrt{35}$$

$$= \sqrt{3,5}$$

$$R = Y_{\max} - X_{\min}$$

$$R = 450 - 100$$

$$R = 350$$

$$a = \frac{350}{10}$$

$$a = 35$$

Tabla

#	Intervalo	X_i	f_i	F_i	h_i	H_i
1	100 - 134	117	4	4	0.11	0.11
2	135 - 169	152	3	7	0.09	0.20
3	170 - 204	187	3	10	0.09	0.29
4	205 - 239	222	3	13	0.09	0.38
5	240 - 274	257	3	16	0.09	0.47
6	275 - 309	292	4	20	0.11	0.58
7	310 - 344	327	3	23	0.09	0.67
8	345 - 379	362	4	27	0.11	0.78
9	380 - 414	397	4	31	0.11	0.89
10	415 - 450	432	4	35	0.11	1.00

Tabla 4 Peso:

Datos: 54.08, 77.8, 64, 55.2, 69.5, 47.86, 56, 63, 48.03, 50, 64, 40, 54, 59.15, 75.5, 67.6, 58, 63, 26, 54.2, 64.2, 63.27, 54.2, 54, 66.5, 49.45, 53.2, 70.2, 40.5, 60, 61, 61.32, 48.5, 54, 66.8, 66.8, 53.8, 72.8, 60, 53, 48, 56, 73, 63.5, 78, 46, 65, 50.5, 78, 64, 70.12, 74.5, 88.5, 67, 58, 75.5

Cálculos:

$$R = X_{\max} - X_{\min}$$

$$= \sqrt{n}$$

$$R = 40.5 - 47.86$$

$$= \sqrt{53}$$

$$R = 42.34$$

$$a = \frac{42.34}{10}$$

Tabla

#	Intervalo	X_i	f_i	F_i	h_i	H_i
1	47.86 - 52.16	50.01	7	7	0.13	0.13
2	52.16 - 56.46	54.31	11	18	0.21	0.34
3	56.46 - 60.76	58.61	9	27	0.17	0.51
4	60.76 - 65.06	62.91	8	35	0.15	0.66
5	65.06 - 69.36	67.21	6	41	0.11	0.77
6	69.36 - 73.66	71.51	4	45	0.08	0.85
7	73.66 - 77.96	75.81	3	48	0.06	0.91
8	77.96 - 82.26	80.11	3	51	0.06	0.97
9	82.26 - 86.56	84.41	1	52	0.02	0.99
10	86.56 - 90.86	88.53	1	53	0.02	1.00

Tabla 5 - Talla:

Datos: 1.64, 1.50, 1.70, 1.62, 1.65, 1.70, 1.68, 1.54, 1.70, 1.53,
 1.61, 1.78, 1.50, 1.64, 1.60, 1.66, 1.67, 1.65, 1.54, 1.52, 1.67, 1.56,
 1.52, 1.57, 1.48, 1.53, 1.55, 1.64, 1.73, 1.58, 1.67, 1.68, 1.50, 1.67,
 1.64, 1.61, 1.75, 1.67, 1.55, 1.50, 1.68, 1.73, 1.70, 1.77, 1.66,
 1.66, 1.65, 1.53, 1.70, 1.70, 1.78, 1.78, 1.64, 1.54, 1.75

Calculos:

$$= \sqrt{n}$$

$$= \sqrt{53}$$

$$R = X_{\max} - X_{\min}$$

$$R = 1.78 - 1.48$$

$$R = 0.30$$

$$a = \frac{0.30}{10} \quad a = 0.03$$

Tabla:

#	Intervalos	X_p	f_i	F_i	H_i	h_i
1	1.48 - 1.51	1.495	5	5	0.09	0.09
2	1.51 - 1.54	1.525	6	11	0.11	0.20
3	1.54 - 1.57	1.555	7	18	0.13	0.33
4	1.57 - 1.60	1.585	6	24	0.11	0.44
5	1.60 - 1.63	1.615	5	29	0.09	0.53
6	1.63 - 1.66	1.645	6	35	0.11	0.64
7	1.66 - 1.69	1.675	6	41	0.11	0.75
8	1.69 - 1.72	1.705	5	46	0.09	0.84
9	1.72 - 1.75	1.735	4	50	0.08	0.92
10	1.75 - 1.78	1.765	3	53	0.06	1.00