U3A Maths

11-Feb-2022   Term 1 / Week 2

(Please refer to 2021 Term 2, Week 7 to Week 10 notes on seshveda.com)

Test Run 1 - Bessel Correction factor gives better results

	Population consists of numbers 1 to 100							
	Pop Mean	Std dev						
	50.50	28.87						
Sample No =>	#1	#2	#3	#4	#5	#6	#7	
Sample Size (N) = 10								
	22.0	35.0	78.0	1.0	66.0	21.0	70.0	
	81.0	31.0	8.0	41.0	32.0	71.0	16.0	
	81.0	22.0	82.0	69.0	54.0	90.0	32.0	
	95.0	53.0	11.0	80.0	61.0	56.0	97.0	
	34.0	9.0	40.0	21.0	2.0	9.0	44.0	
	84.0	69.0	88.0	59.0	91.0	45.0	87.0	
	66.0	0.0	9.0	20.0	22.0	43.0	3.0	
	81.0	52.0	60.0	10.0	61.0	3.0	41.0	
	93.0	5.0	72.0	30.0	95.0	43.0	91.0	
	29.0	99.0	33.0	41.0	38.0	77.0	22.0	
								Est Pop Mean & Std Dev
Sample Mean	66.60	37.50	48.10	37.20	52.20	45.80	50.30	48.24
Sample StdDev(N)	26.26	29.65	30.26	24.51	27.80	27.36	32.01	28.26
Sample StdDev(N-1)	27.68	31.24	30.11	22.49	28.90	27.49	33.03	28.70

[Note: Bessel Correction Factor = Sqrt(N/(N-1)) = Sqrt (10/9) = 1.054]

Test Run 2 - Bessel Correction factor DOES NOT give better results!!

	Population consists of numbers 1 to 100							
	Pop Mean	Std dev						
	50.50	28.87						
Sample No =>	#1	#2	#3	#4	#5	#6	#7	
Sample Size (N) = 10								
	71.0	95.0	66.0	76.0	26.0	8.0	96.0	
	52.0	76.0	62.0	8.0	5.0	66.0	49.0	
	42.0	46.0	9.0	95.0	30.0	64.0	34.0	
	55.0	2.0	97.0	24.0	10.0	65.0	45.0	
	64.0	67.0	90.0	43.0	56.0	99.0	3.0	
	36.0	56.0	80.0	24.0	90.0	78.0	81.0	
	87.0	19.0	48.0	9.0	50.0	34.0	0.0	
	2.0	43.0	9.0	77.0	53.0	72.0	68.0	
	45.0	14.0	2.0	87.0	7.0	47.0	32.0	
	86.0	79.0	85.0	4.0	45.0	47.0	56.0	
								Est Pop Mean & Std Dev
Sample Mean	54.00	49.70	54.80	44.70	37.20	58.00	46.40	49.26
Sample StdDev(N)	24.00	29.14	34.31	33.88	25.46	23.97	29.36	28.59
Sample StdDev(N-1)	25.30	26.27	35.95	33.98	26.55	18.15	25.58	27.40

[Note: Bessel Correction Factor = Sqrt(N/(N-1)) = Sqrt (10/9) = 1.054]

Test Run 3 - Samples are not representative ?? (Error = Approx 10%)

	Population consists of numbers 1 to 100							
	Pop Mean	Std dev						
	50.50	28.87						
Sample No =>	#1	#2	#3	#4	#5	#6	#7	
Sample Size (N) = 10								
	86.0	26.0	99.0	55.0	74.0	55.0	22.0	
	12.0	10.0	19.0	85.0	42.0	85.0	80.0	
	52.0	52.0	41.0	99.0	84.0	31.0	1.0	
	71.0	90.0	72.0	86.0	57.0	87.0	24.0	
	56.0	49.0	95.0	42.0	66.0	49.0	74.0	
	21.0	4.0	85.0	98.0	82.0	56.0	52.0	
	76.0	88.0	94.0	38.0	8.0	7.0	21.0	
	99.0	2.0	98.0	52.0	74.0	2.0	59.0	
	17.0	82.0	20.0	60.0	84.0	19.0	98.0	
	91.0	92.0	5.0	3.0	15.0	93.0	92.0	
								Est Pop Mean & Std Dev
Sample Mean	58.10	49.50	62.80	61.80	58.60	48.40	52.30	55.93
Sample StdDev(N)	30.42	35.26	35.64	28.95	26.66	31.55	32.06	31.50
Sample StdDev(N-1)	32.06	36.24	35.35	30.42	27.57	33.18	32.07	32.41

[Note: Bessel Correction Factor = Sqrt(N/(N-1)) = Sqrt (10/9) = 1.054]

Test Run # 4 - Almost perfect sampling!!!

	Population consists of numbers 1 to 100							
	Pop Mean	Std dev						
	50.50	28.87						
Sample No =>	#1	#2	#3	#4	#5	#6	#7	
Sample Size (N) = 10								
	76.0	21.0	42.0	14.0	36.0	39.0	69.0	
	46.0	21.0	32.0	32.0	47.0	18.0	3.0	
	34.0	0.0	88.0	42.0	40.0	79.0	77.0	
	65.0	88.0	91.0	99.0	80.0	47.0	47.0	
	22.0	27.0	95.0	80.0	11.0	11.0	50.0	
	84.0	3.0	8.0	27.0	59.0	39.0	24.0	
	96.0	95.0	21.0	94.0	27.0	42.0	66.0	
	77.0	29.0	77.0	70.0	34.0	68.0	19.0	
	49.0	27.0	77.0	41.0	80.0	75.0	49.0	
	26.0	91.0	19.0	19.0	34.0	90.0	99.0	
								Est Pop Mean & Std Dev
Sample Mean	57.50	40.20	55.00	51.80	44.80	50.80	50.30	50.06
Sample StdDev(N)	24.44	34.76	32.11	29.77	21.16	24.99	27.57	27.83
Sample StdDev(N-1)	25.76	36.01	33.54	28.43	22.09	26.01	28.31	28.59

[Note: Bessel Correction Factor = Sqrt(N/(N-1)) = Sqrt (10/9) = 1.054]