Practical: 04

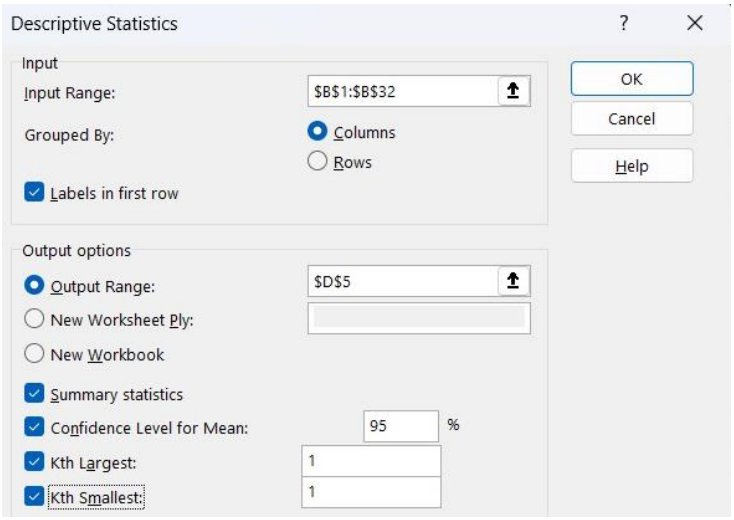
A. Perform testing of hypothesis using one sample t-test.

One sample t-test: The One Sample T Test determines whether the sample mean is statistically different from a known or hypothesized population mean. The One Sample T Testis a parametric test.

No. Of Bars	Protein Values
1	20.7
2	20.75
3	22.14
4	22.12
5	27.46
6	22.91
7	19.56
8	22.15
9	25.34
10	21.1
11	19.85
12	20.33
13	18.04
14	21.29
15	21.54
16	24.12
17	24.75
18	21.08
19	19.95
20	25.06
21	21.39
22	19.72
23	22.44
24	22.33
25	18.28
26	19.08
27	25.79
28	16.26
29	19.88
30	20.53
31	17.46

Here,
H0 is population mean is 20.
H1 is population mean is not 20.

First, we require descriptive statistics for above data.



Protein Values	
Mean	21.4
Standard Error	0.4564972
Median	21.1
Mode	#N/A
Standard Deviation	2.5416687
Sample Variance	6.46008
Kurtosis	0.1453746
Skewness	0.3907659
Range	11.2
Minimum	16.26
Maximum	27.46
Sum	663.4
Count	31
Largest(1)	27.46
Smallest(1)	16.26
Confidence Level(95.0%)	0.9322916

We require Mean, Standard Error, Standard Deviation and Count.
We require to degrees of freedom, hypothesized mean, alpha value, t-statistic, p-value.
We calculate degrees of freedom as function= E19 -1.
Hypothesized mean is 20 and Alpha value is taken as 0.05.
t-statistic is calculated as function = (E7-E25)/E8.
P value is calculatedas function = TDIST (E27, E24, 2)

	D	E
6		
7	Mean	21.4
8	Standard Error	0.4564972
9	Median	21.1
10	Mode	#N/A
11	Standard Deviation	2.5416687
12	Sample Variance	6.46008
13	Kurtosis	0.1453746
14	Skewness	0.3907659
15	Range	11.2
16	Minimum	16.26
17	Maximum	27.46
18	Sum	663.4
19	Count	31
20	Largest(1)	27.46
21	Smallest(1)	16.26
22	Confidence Level(95.0%)	0.9322916
23		
24	degrees of freedom	30
25	hypothesized mean	20
26	alpha value	0.05
27	t-statistic	3.0668316
28	p-value	0.0045526

Then for final step of T-test, we use function =IF(E28>E26,"H0 accepted, H1 rejected","H1accepted")

Output:

	D	E	F
23			
24	degrees of freedom	30	
25	hypothesized mean	20	
26	alpha value	0.05	
27	t-statistic	3.0668316	
28	p-value	0.0045526	
29			
30	H1 accepted		
31			
32			