UNIT TEN ARTEFACT

E-PORTFOLIO ACTIVITY: STATISTICAL WORKSHEET SUBMISSIONS

REPORT OF STATISTICAL ANALYSIS AND INTERPRETATION OF DATASETS OF FOUR DATA SETS: DIET A AND B, AGENT 1 AND 2, MALE AND FEMALE INCOME, AREA 1 AND 2

1.0 INTRODUCTION

Descriptive statistics was applied to analyse and interpret the four data sets: Diet A and B, Agent 1 and 2, Male and Female Income, and Area 1 and 2. There was an assumption that the data sets had equal variance. According to Hill, Berry, Hill and Berry (2021), descriptive statistics are crucial for simplifying datasets, applying calculations of variability or central decency, identifying outliers, and visualising data through graphs, charts, and tables. Descriptive statistics enable further statistical analysis through predictive modelling or inferential statistics (Hill, Berry, Hill & Berry, 2021).

According to Ghanad (2023), descriptive statistics is a quantitative research method. Quantitative statistics are about collecting quantifiable data, analysing, and interpreting to prove or disprove a hypothesis of the study. Quantitative statistics is systematically collecting data using an instrument, and data is collected from a sample population to answer preset research questions.

The data was analysed using a t-test paired two samples for means and analysis of variance (ANOVA) for a single factor. The paired two-sample t-test determines if the means of two related groups significantly differ. This test is usually applied to two paired small sample data sets. This, therefore, enhances the ability to efficiently and effectively compare two sample data. The single factor ANOVA is important for comparing the means of two or more groups of data sets and reduces the risk of type I error (false positive). The false positive is when the null hypothesis is incorrectly rejected. The single-factor ANOVA also helps determine the statistical difference between the variances of two or more data sets.

2.0 STATISTICAL ANALYSIS OF THE DATA SETS AND INTERPRETATION OF THE RESULTS -DIET A AND DIET B

2.1 Presentation of Analysis of Data Using Descriptive Statistics

This analysis was undertaken from a Null Hypothesis (H_0) perspective. This means that there is no difference between the means of diet A and diet B. The null hypothesis is stated below.

H_0: There is no difference in the means of diet A and diet B.

Table 2.1: Diet A

Mean	5.341
Standard Error	0.359
Median	5.642
Mode	#N/A
Standard Deviation	2.535602613
Sample Variance	6.429280612
Kurtosis	0.404479588
Skewness	-0.609369094
Range	11.777
Minimum	-1.715
Maximum	10.062
Sum	267.06
Count	50
Confidence Level (95.0%)	0.720610289

Table 2.2: Diet B

Mean	3.710
Standard Error	0.391601675
Median	3.745
Mode	#N/A
Standard Deviation	2.769041999
Sample Variance	7.66759359
Kurtosis	0.652638378
Skewness	-0.203575964
Range	14.687
Minimum	-4.148
Maximum	10.539
Sum	185.498
Count	50
Confidence Level (95.0%)	0.786953029

Table 2.3: Two-Sample Assuming Equal Variances

	Variable 1	*Variable 2*
Mean	5.3412	3.70996
Variance	6.429280612	7.66759359
Observations	50	50
Pooled Variance	7.048437101	
Hypothesised Mean Difference	0	
df	98	
t Stat	3.072143179	
P(T<=t) one-tail	0.001375772	
t Critical one-tail	1.660551217	
P(T<=t) two-tail	0.002751544	
t Critical two-tail	1.984467455	

Table 2.4: Single Factor Analysis of Variance (ANOVA)

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Wtloss A	50	267.06	5.3412	6.429281
Wtloss B	50	185.498	3.70996	7.667594

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	66.52359844	1	66.5236	9.438064	0.002752	3.938111
Within Groups	690.7468359	98	7.048437			
Total	757.2704344	99				

Summary Output

Table 2.6: Regression Statistics

Regression Statistics	
Multiple R	0.296389194
R Square	0.087846554
Adjusted R Square	0.078538866
Standard Error	2.654889282
Observations	100

Table 2.7: Analysis of Variance (ANOVA)

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	66.52359844	66.52359844	9.438064	0.002752
Residual	98	690.7468359	7.048437101		
Total	99	757.2704344			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*	*Upper 95.0%*
Intercept	5.3412	0.375458043	14.2258239	1.42E-25	4.596116	6.086284	4.596116	6.086284	6.600991
Diet Code	-1.6312	0.530977856	-3.072143179	0.00275	-2.68495	-0.57753	-2.68495	-0.57753	-0.25656

Table 2.8: Residual Output

RESIDUAL OUTPUT

Observation	*Predicted Wtloss*	*Residuals*
1	5.3412	-1.6322
2	5.3412	1.7458
3	5.3412	1.4128
4	5.3412	3.6528
5	5.3412	3.7358
6	5.3412	1.0718
7	5.3412	0.5358
8	5.3412	-2.7692
9	5.3412	2.1788
10	5.3412	1.5398
11	5.3412	1.9238
12	5.3412	-1.8642
13	5.3412	-1.5862
14	5.3412	3.4188
15	5.3412	1.6908
16	5.3412	3.7108
17	5.3412	4.7208
18	5.3412	-0.5012
19	5.3412	1.1078
20	5.3412	3.6778
21	5.3412	-7.0562
22	5.3412	-0.6232
23	5.3412	-1.3342
24	5.3412	1.8998

25	5.3412	-3.2132
26	5.3412	1.6268
27	5.3412	-0.4882
28	5.3412	-5.2862
29	5.3412	-2.6612
30	5.3412	-1.5952
31	5.3412	1.6918
32	5.3412	-0.3082
33	5.3412	0.2278
34	5.3412	1.3708
35	5.3412	-1.6782
36	5.3412	-2.6002
37	5.3412	0.9148
38	5.3412	0.0078
39	5.3412	1.9588
40	5.3412	0.1038
41	5.3412	-0.3712
42	5.3412	-1.7282
43	5.3412	2.2268
44	5.3412	0.5198
45	5.3412	-1.1842
46	5.3412	-5.1382
47	5.3412	-0.9002
48	5.3412	0.5338
49	5.3412	0.3738
50	5.3412	-5.0612
51	3.70996	-4.79696
52	3.70996	-1.89096
53	3.70996	-3.63596
54	3.70996	-1.95496
55	3.70996	-1.82096
56	3.70996	-0.62096
57	3.70996	0.29804
58	3.70996	0.84104
59	3.70996	-2.33796
60	3.70996	-0.29696
61	3.70996	-7.85796
62	3.70996	-0.88696
63	3.70996	-0.84496
64	3.70996	0.65904
65	3.70996	2.62704
66	3.70996	2.59804
67	3.70996	-0.21596
68	3.70996	6.82904
69	3.70996	0.13004
70	3.70996	1.41304
71	3.70996	1.77504
72	3.70996	-5.60396
73	3.70996	4.30604
74	3.70996	-1.39996

75	3.70996	0.17204
76	3.70996	3.32004
77	3.70996	4.01704
78	3.70996	-3.60496
79	3.70996	-0.05996
80	3.70996	0.83704
81	3.70996	1.27504
82	3.70996	1.44904
83	3.70996	1.05004
84	3.70996	1.22404
85	3.70996	-0.60396
86	3.70996	1.88804
87	3.70996	-1.54796
88	3.70996	2.81004
89	3.70996	3.33604
90	3.70996	-1.95296
91	3.70996	-1.86196
92	3.70996	-2.61396
93	3.70996	-1.56496
94	3.70996	4.72504
95	3.70996	2.38904
96	3.70996	0.26204
97	3.70996	-1.30096
98	3.70996	-3.14096
99	3.70996	3.30304
100	3.70996	-1.11596

2.2 Interpretation of the Results of the Statistical Analysis of Diet A and B

Descriptive statistics was applied. A two-sample t-test was applied while assuming variance between diet A and B. The two-sample t-test was applied because they are two independent diets, and there is a need to find out if there is a significant statistical difference between them in terms of weight loss or weight gain between the two groups. Applying a two-sample test will provide a clear statistical insight into which diet is more effective and provide an informed decision. A single-factor ANOVA test was used to determine whether there were statistically significant differences between the mean of the unrelated groups (Diet A and B).

The mean of Diet A is 5.34, and Diet B is 3.71 for a group of 50 observations. As per the assumption of equal variance, the pooled variance for the two groups is 7.05.

The degree of freedom (df) is 98% for both groups. The standardised difference between the two means is 3.07, relative to the pooled standard error.

The p-value of the two-tailed test is 0.00275, which is less than the significance level of 0.05. This indicates that the Null Hypothesis (H_0) was rejected. The t-statistics was 3.07, exceeding the critical t-value of 1.98 for the two-tail test. This, therefore, means that the null hypothesis was also rejected.

3.0 STATISTICAL ANALYSIS OF THE DATA SETS AND INTERPRETATION OF THE RESULTS -AGENT 1 AND AGENT 2

This analysis was undertaken from a Null Hypothesis (H_0) perspective. This means that there is no difference between the means of Agent 1 and Agent 2. The null hypothesis is stated below.

H_0: There is no difference in the means of Agent 1 and Agent 2.

3.1 Presentation of Analysis of Data Using Descriptive Statistics

Table 3.1: Agent 1

Agent1	
Mean	8.25
Standard Error	0.297081766
Median	8.4
Mode	8.7
Standard Deviation	1.029121426
Sample Variance	1.059090909
Kurtosis	-1.682302247
Skewness	-0.158842103
Range	2.7
Minimum	6.8
Maximum	9.5
Sum	99
Count	12
Confidence Level (95.0%)	0.653872559

Table 3.2: Agent 2

Agent2	
Mean	8.683333333
Standard Error	0.299705242
Median	9
Mode	#N/A
Standard Deviation	1.038209414
Sample Variance	1.077878788
Kurtosis	0.48577068
Skewness	-1.00867855
Range	3.4
Minimum	6.4
Maximum	9.8
Sum	104.2
Count	12
Confidence Level (95.0%)	0.659646791

Table 3.3: Two-Sample T-Test Assuming Equal Variances

t-Test: Two-Sample Assuming Equal Variances

	Agent1	*Agent2*
Mean	8.25	8.683333333
Variance	1.059090909	1.077878788
Observations	12	12
Pooled Variance	1.068484848	
Hypothesised Mean Difference	0	
df	22	
t Stat	-1.026865443	
P(T<=t) one-tail	0.157821259	
t Critical one-tail	1.717144374	
P(T<=t) two-tail	0.315642517	
t Critical two-tail	2.073873068	

Table 3.4: Single Factor Analysis of Variance (ANOVA)

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Agent1	12	99	8.25	1.059091
Agent2	12	104.2	8.683333	1.077879

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	1.126667	1	1.126667	1.054453	0.315643	4.30095
Within Groups	23.50667	22	1.068485			
Total	24.63333	23				

Table 3.5: Summary Output

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.22889628 1
R Square	0.05239350 8
Adjusted R Square	-0.1581857 13
Standard Error	3.88025956 2
Observations	12

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	7.492271592	3.746135	0.248807	0.784921
Residual	9	135.5077284	15.05641		
Total	11	143			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.31749728	9.93386285	-0.03196	0.975204	-22.7895	22.15456	-22.7895	22.15456
Agent1	-0.13497715	2.62123064 5	-0.05149	0.960057	-6.06461	5.794658	-6.06461	5.794658
Agent2	-0.9133 60754	2.59828564 6	-0.35152 4	0.732844	-4.96437	6.791091	-4.96437	6.791091

Table 3.6: Residual Output

RESIDUAL OUTPUT

Observation	*Predicted Batch*	*Residuals*
1	6.406788272	-5.40678827
2	7.209018528	-5.20901853
3	4.610210632	-1.61021063
4	7.351197364	-3.35119736
5	7.00249916	-2.00249916
6	5.692745766	0.307254234
7	6.159775589	0.840224411
8	5.757086298	2.242913702
9	7.093835235	1.906164765
10	6.542670457	3.457329543
11	7.27335906	3.72664094
12	6.900813638	5.099186362

3.2 Interpretation of the Results of the Statistical Analysis of Agent 1 and Agent 2

The means for Agents 1 and 2 are 8.25 and 8.68, respectively. There is a justification for equal variance because their variances are very close, 1.059 for Agent 1 and 1.078 for Agent 2. The t-stat is 1.027, and the degree of freedom (df) is 22.

As per the one-tail test, the p-value of 0.158 is more significant than the critical level of 0.05. This, therefore, means that we fail to reject the null hypothesis. This indicated no evidence that one group was less or greater than the other.

As per the two-tail test, the p-value is 0.316, more significant than the critical level of 0.05. This indicated that there was no significant difference between the two groups.

This, therefore, results in a lack of significant difference between the mean of Agents 1 and 2.

4.0 STATISTICAL ANALYSIS OF THE DATA SETS AND INTERPRETATION OF THE RESULTS –MALE AND FEMALE INCOME

This analysis was undertaken from a Null Hypothesis (H_0) perspective. This means there is no difference between the means of Male and Female Income. The null hypothesis is stated below.

H_0: There is no difference in the means of Male Income and Female Income.

4.1 Presentation of Analysis of Data Using Descriptive Statistics

Table 4.1: Male Income

Male income	
Mean	52.9133333
Standard Error	1.97116282
Median	52.05
Mode	54.6
Standard Deviation	15.2685615
Sample Variance	233.128972
Kurtosis	0.47064083
Skewness	0.72494335
Range	69.9
Minimum	31
Maximum	100.9
Sum	3174.8
Count	60
Confidence Level (95.0%)	3.94428769

Table 4.2: Female Income

Female Income	
Mean	44.2333333
Standard Error	1.7803362
Median	38.15
Mode	33.4
Standard Deviation	13.7904249
Sample Variance	190.175819
Kurtosis	0.35112373
Skewness	1.09975931
Range	52.9
Minimum	30
Maximum	82.9
Sum	2654

Count	60
Confidence Level (95.0%)	3.56244451

Table 4.3: Two-Sample T-Test Assuming Equal Variances

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	*Variable 2*
Mean	52.91333333	44.23333333
Variance	233.1289718	190.1758192
Observations	60	60
Pooled Variance	211.6523955	
Hypothesised Mean Difference	0	
df	118	
t Stat	3.267900001	
P(T<=t) one-tail	0.000709735	
t Critical one-tail	1.657869522	
P(T<=t) two-tail	0.00141947	
t Critical two-tail	1.980272249	

Table 4.4: Single Factor Analysis of Variance (ANOVA)

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
MALE	60	3174.8	52.91333	233.129
FEMALE	60	2654	44.23333	190.1758

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	2260.272	1	2260.272	10.67917	0.001419	3.921478
Within Groups	24974.98	118	211.6524			
Total	27235.25	119				

Table 4.5: Summary Output

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.288081
R Square	0.082991
Adjusted R Square	0.075219
Standard Error	14.54828
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	2260.272	2260.272	10.67917	0.001419
Residual	118	24974.98	211.6524		
Total	119	27235.25			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	61.59333	4.199726	14.66604	2.33E-28	53.27673	69.90993	53.27673	69.90993
Sex Code	-8.68	2.656154	-3.2679	0.001419	-13.9399	-3.42012	-13.9399	-3.42012

Table 4.6: Residual Output

RESIDUAL OUTPUT

Observation	*Predicted Income*	*Residuals*
1	52.91333	-12.3133
2	52.91333	1.686667
3	52.91333	-14.3133
4	52.91333	5.286667
5	52.91333	-18.3133
6	52.91333	-10.0133
7	52.91333	14.58667
8	52.91333	26.88667
9	52.91333	1.486667
10	52.91333	-5.61333
11	52.91333	13.48667
12	52.91333	16.08667
13	52.91333	9.086667
14	52.91333	-0.41333
15	52.91333	19.68667
16	52.91333	-0.51333
17	52.91333	6.586667
18	52.91333	6.186667
19	52.91333	-16.2133
20	52.91333	1.686667
21	52.91333	-0.81333
22	52.91333	-3.01333
23	52.91333	-0.91333
24	52.91333	-5.81333
25	52.91333	-12.1133
26	52.91333	-16.4133
27	52.91333	4.186667
28	52.91333	1.186667
29	52.91333	-20.5133
30	52.91333	-18.0133
31	52.91333	11.18667
32	52.91333	1.086667
33	52.91333	-1.41333
34	52.91333	-2.11333
35	52.91333	-7.81333
36	52.91333	28.58667
37	52.91333	17.48667
38	52.91333	-13.7133
39	52.91333	-7.71333
40	52.91333	27.98667
41	52.91333	-4.31333
42	52.91333	-21.9133
43	52.91333	-20.8133
44	52.91333	-19.0133

45	52.91333	-21.6133
46	52.91333	-1.91333
47	52.91333	0.486667
48	52.91333	5.386667
49	52.91333	-21.5133
50	52.91333	3.386667
51	52.91333	-11.9133
52	52.91333	-5.01333
53	52.91333	-1.51333
54	52.91333	-19.8133
55	52.91333	21.98667
56	52.91333	24.28667
57	52.91333	4.986667
58	52.91333	27.18667
59	52.91333	-12.7133
60	52.91333	47.98667
61	44.23333	-11.1333
62	44.23333	-8.43333
63	44.23333	24.56667
64	44.23333	-12.6333
65	44.23333	-6.03333
66	44.23333	-2.23333
67	44.23333	-10.8333
68	44.23333	6.066667
69	44.23333	-4.63333
70	44.23333	-13.5333
71	44.23333	-12.9333
72	44.23333	17.06667
73	44.23333	-14.2333
74	44.23333	-6.13333
75	44.23333	12.16667
76	44.23333	-8.53333
77	44.23333	-12.9333
78	44.23333	-3.83333
79	44.23333	-12.1333
80	44.23333	22.16667
81	44.23333	-7.33333
82	44.23333	-8.33333
83	44.23333	5.366667
84	44.23333	18.56667
85	44.23333	0.366667
86	44.23333	-11.7333
87	44.23333	-10.8333
88	44.23333	11.06667
89	44.23333	18.46667
90	44.23333	10.16667
91	44.23333	-13.4333
92	44.23333	4.866667
93	44.23333	-2.33333
94	44.23333	-11.7333

95	44.23333	-9.03333
96	44.23333	3.166667
97	44.23333	16.46667
98	44.23333	-11.2333
99	44.23333	-0.93333
100	44.23333	-9.43333
101	44.23333	-8.23333
102	44.23333	7.366667
103	44.23333	-12.3333
104	44.23333	-10.1333
105	44.23333	34.16667
106	44.23333	-13.8333
107	44.23333	1.066667
108	44.23333	8.366667
109	44.23333	-13.9333
110	44.23333	-7.63333
111	44.23333	8.866667
112	44.23333	-7.73333
113	44.23333	-6.43333
114	44.23333	-10.2333
115	44.23333	25.06667
116	44.23333	32.96667
117	44.23333	-11.6333
118	44.23333	38.66667
119	44.23333	-1.93333
120	44.23333	13.56667

4.2 Interpretation of the Results of the Statistical Analysis of Male and Female Income

The mean for Male Income is 52.91, and the Mean for Female Income is 44.23. The variances for the male income are 233.13 and 190.18 for the female income. This demonstrated that males' average income is higher than females'. The t-statistic is 3.27, and the degree of freedom (df) is 118. The p-value for the one tail is 0.00071, and for the two, it is 0.00142, which are all below the critical value of 0.005. The null hypothesis was rejected. This indicated a significant difference between the income of males and females.

5.0 STATISTICAL ANALYSIS OF THE DATA SETS AND INTERPRETATION OF THE RESULTS –AREA 1 AND AREA 2

This analysis was undertaken from a Null Hypothesis (H_0) perspective. This means that there is no difference between the means of Area 1 and Area 2. The null hypothesis is stated below.

H_0: There is no difference in the means of Area 1 and Area 2.

5.1 Presentation of Analysis of Data Using Descriptive Statistics

Table 5.1: Area 1

Area 1	
Mean	23.33333333
Standard Error	9.492687244
Median	17
Mode	#N/A
Standard Deviation	16.44181661
Sample Variance	270.3333333
Kurtosis	#DIV/0!
Skewness	1.476191507
Range	31
Minimum	11
Maximum	42
Sum	70
Count	3
Confidence Level (95.0%)	40.84373668

Table 5.2: Area 2

Area 2	
Mean	30
Standard Error	6.350852961
Median	30
Mode	#N/A
Standard Deviation	11
Sample Variance	121
Kurtosis	#DIV/0!
Skewness	0
Range	22
Minimum	19

Maximum	41
Sum	90
Count	3
Confidence Level (95.0%)	27.32551483

Table 5.3: Two-Sample T-Test for the Means

t-Test: Paired Two Sample for Means

	Area 1	*Area 2*
Mean	23.33333333	30
Variance	270.3333333	121
Observations	3	3
Pearson Correlation	0.942718215	
Hypothesised Mean Difference	0	
df	2	
t Stat	-1.627576918	
P(T<=t) one-tail	0.122574322	
t Critical one-tail	2.91998558	
P(T<=t) two-tail	0.245148644	
t Critical two-tail	4.30265273	

Table 5.4: Single Factor Analysis of Variance (ANOVA)

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Area 1	3	70	23.33333	270.3333
Area 2	3	90	30	121

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	66.66666667	1	66.66667	0.340716	0.590747	7.708647
Within Groups	782.6666667	4	195.6667			
Total	849.3333333	5				

Table 5.5: Summary Output

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.12744007
R Square	0.01624097
Adjusted R Square	0.01001464
Standard Error	0.77088495
Observations	160

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	1.55009920 6	1.55009920 6	2.60843701 9	0.10829165 3
Residual	158	93.893650 79	0.59426361 3		
Total	159	95.44375			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	4.64126984 1	0.20139724 4	23.0453493 7	2.12754E-52	4.24349174 2	5.03904794 1	4.243492	5.039048
Area	-0.19841269 8	0.12285116 7	-1.6150656 39	0.10829163 53	-0.4410550 64	0.04422967	-0.44106	0.04423

Table 5.6: Residential Output

RESIDUAL OUTPUT

Observation	*Predicted Brand code*	*Residuals*
1	4.442857143	-0.442857143
2	4.442857143	0.557142857
3	4.442857143	-1.442857143
4	4.442857143	-0.442857143
5	4.442857143	0.557142857
6	4.442857143	-1.442857143
7	4.442857143	0.557142857
8	4.442857143	0.557142857
9	4.442857143	0.557142857
10	4.442857143	0.557142857
11	4.442857143	-0.442857143
12	4.442857143	0.557142857
13	4.442857143	0.557142857
14	4.442857143	-1.442857143
15	4.442857143	-1.442857143
16	4.442857143	-1.442857143
17	4.442857143	-0.442857143
18	4.442857143	-1.442857143
19	4.442857143	0.557142857
20	4.442857143	-0.442857143
21	4.442857143	-1.442857143
22	4.442857143	-0.442857143
23	4.442857143	0.557142857
24	4.442857143	0.557142857
25	4.442857143	-0.442857143
26	4.442857143	-0.442857143
27	4.442857143	0.557142857
28	4.442857143	0.557142857
29	4.442857143	0.557142857
30	4.442857143	0.557142857
31	4.442857143	0.557142857
32	4.442857143	-0.442857143
33	4.442857143	-0.442857143
34	4.442857143	0.557142857
35	4.442857143	0.557142857
36	4.442857143	-0.442857143
37	4.442857143	-0.442857143
38	4.442857143	-0.442857143
39	4.442857143	0.557142857
40	4.442857143	0.557142857
41	4.442857143	-0.442857143
42	4.442857143	0.557142857
43	4.442857143	0.557142857
44	4.442857143	0.557142857
45	4.442857143	0.557142857

46	4.442857143	0.557142857
47	4.442857143	0.557142857
48	4.442857143	0.557142857
49	4.442857143	0.557142857
50	4.442857143	0.557142857
51	4.442857143	-1.442857143
52	4.442857143	0.557142857
53	4.442857143	-1.442857143
54	4.442857143	0.557142857
55	4.442857143	0.557142857
56	4.442857143	0.557142857
57	4.442857143	-1.442857143
58	4.442857143	-1.442857143
59	4.442857143	0.557142857
60	4.442857143	0.557142857
61	4.442857143	0.557142857
62	4.442857143	0.557142857
63	4.442857143	0.557142857
64	4.442857143	0.557142857
65	4.442857143	-0.442857143
66	4.442857143	0.557142857
67	4.442857143	-0.442857143
68	4.442857143	0.557142857
69	4.442857143	0.557142857
70	4.442857143	-0.442857143
71	4.244444444	-1.244444444
72	4.244444444	-0.244444444
73	4.244444444	-1.244444444
74	4.244444444	0.755555556
75	4.244444444	-1.244444444
76	4.244444444	-0.244444444
77	4.244444444	0.755555556
78	4.244444444	0.755555556
79	4.244444444	-0.244444444
80	4.244444444	-0.244444444
81	4.244444444	0.755555556
82	4.244444444	-0.244444444
83	4.244444444	-0.244444444
84	4.244444444	0.755555556
85	4.244444444	0.755555556
86	4.244444444	-1.244444444
87	4.244444444	-0.244444444
88	4.244444444	-1.244444444
89	4.244444444	0.755555556
90	4.244444444	-0.244444444
91	4.244444444	0.755555556
92	4.244444444	0.755555556
93	4.244444444	-1.244444444
94	4.244444444	0.755555556
95	4.244444444	-1.244444444

96	4.244444444	-0.244444444
97	4.244444444	0.755555556
98	4.244444444	-0.244444444
99	4.244444444	0.755555556
100	4.244444444	-0.244444444
101	4.244444444	0.755555556
102	4.244444444	-0.244444444
103	4.244444444	0.755555556
104	4.244444444	-0.244444444
105	4.244444444	-1.244444444
106	4.244444444	-1.244444444
107	4.244444444	0.755555556
108	4.244444444	-0.244444444
109	4.244444444	0.755555556
110	4.244444444	0.755555556
111	4.244444444	-1.244444444
112	4.244444444	-0.244444444
113	4.244444444	-0.244444444
114	4.244444444	0.755555556
115	4.244444444	0.755555556
116	4.244444444	0.755555556
117	4.244444444	0.755555556
118	4.244444444	-0.244444444
119	4.244444444	-0.244444444
120	4.244444444	-0.244444444
121	4.244444444	0.755555556
122	4.244444444	0.755555556
123	4.244444444	-0.244444444
124	4.244444444	-0.244444444
125	4.244444444	-1.244444444
126	4.244444444	0.755555556
127	4.244444444	-0.244444444
128	4.244444444	-1.244444444
129	4.244444444	-1.244444444
130	4.244444444	-0.244444444
131	4.244444444	0.755555556
132	4.244444444	0.755555556
133	4.244444444	0.755555556
134	4.244444444	-0.244444444
135	4.244444444	0.755555556
136	4.244444444	0.755555556
137	4.244444444	-1.244444444
138	4.244444444	0.755555556
139	4.244444444	-1.244444444
140	4.244444444	-0.244444444
141	4.244444444	-0.244444444
142	4.244444444	0.755555556
143	4.244444444	0.755555556
144	4.244444444	-0.244444444
145	4.244444444	0.755555556

146	4.244444444	-1.244444444
147	4.244444444	0.755555556
148	4.244444444	-1.244444444
149	4.244444444	0.755555556
150	4.244444444	0.755555556
151	4.244444444	0.755555556
152	4.244444444	0.755555556
153	4.244444444	0.755555556
154	4.244444444	-1.244444444
155	4.244444444	-0.244444444
156	4.244444444	-1.244444444
157	4.244444444	-0.244444444
158	4.244444444	-0.244444444
159	4.244444444	0.755555556
160	4.244444444	0.755555556

5.2 Interpretation of the Results of the Statistical Analysis of Area 1 and Area 2

The mean for Area 1 is 23.33, and the Mean for Area 2 is 30. The variances for Area 1 are 270.33 and 121 for Area 2. The t-statistics is 1.628, and the degree of freedom (df) is 2. The p-value for one tail is 0.123, and the p-value is 0.245 for two tails. The critical value for one tail was 2.920, and for two tail was 4.303. For the one tail, the p-value was 0.123, more significant than 0.05; hence, we failed to reject the null hypothesis. There is no sufficient evidence that the mean for Area 1 was significantly greater or less than Area 2.

6.0 CONCLUSION

This quantitative study applied descriptive statistical techniques to analyse the four data sets: Diet A and B, Agent 1 and 2, Male and Female Income, and Area 1 and 2. An assumption of equal variance between the datasets was applied.

Regarding the analysis of Data A and B datasets, the p-values were less than the significance level of 0.05. The null hypothesis of no difference in diet A and B's means was rejected.

The analysis of Agent 1 and Agent 2 found a close variance between the two datasets, justifying the assumption of equal variance. We, therefore, fail to

reject the null hypothesis that there is no difference in the means of Agent 1 and Agent 2.

The analysis of Male and Female income demonstrated a variance between the two datasets. The incomes for males are higher than the incomes for females. We, therefore, reject the null hypothesis that there is no difference in the means of Male Income and Female Income.

The statistical analysis of Area 1 and Area 2 did not find sufficient evidence that the means of the two datasets have a significant difference. Therefore, we fail to reject the null hypothesis that there is no difference in the means of Area 1 and Area 2.

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