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Trash Bag Analysis Report

Research Objective: A manufacturer wishes to advertise a new environmentally friendly trash bag on a major TV Network. The manufactures wished to claim that bags strength has been significantly increased compared to past 30-gallon bags. The network wants significance statistical evidence regarding the claim that the new bag is stronger. Agreed testing will measure the variable of strength in terms of poundage of content placed into the bag while suspended in the air. The follow data of n=50 trash bags represent the poundage of trash placed into the bag at the time the bag tore. The new bag's μ mean breaking strength is unknown. The current bag on the market has a known mean breaking strength μ of ≤50 lbs. Alpha of .01 is set for the test. The σ = 20 pounds.

Dataset of Trash Bag Breaking Strengths:

85.195	37.865	146.077	64.737	65.962	118.178	61.255	2.760	5.100	62.478
10.176	109.694	47.795	97.737	71.910	43.160	55.789	103.098	120.065	66.495
72.313	60.044	98.518	16.208	77.533	34.674	33.505	106.634	4.453	35.594
37.202	96.486	6.360	31.285	36.019	14.184	22.850	25.680	66.000	90.369
114.590	40.023	61.988	56.209	19.096	50.726	82.222	14.200	84.025	37.814

Problem Definition –

Compute whether the manufactures claims that the bag strength has significantly increased.

Hypothesis –

H_0: $\mu \leq 50$

H_1: $\mu > 50$

Decision Rule –

If Z test statistic is greater than 2.33 reject the null.

Test –

One-Sample Z: TrashBags

Descriptive Statistics

N	Mean	StDev	SE Mean	99% Lower Bound for μ
50	58.05	35.62	2.83	51.47

μ: mean of TrashBags
Known standard deviation = 20

Test

Null hypothesis H_0: $\mu = 50$
Alternative hypothesis H_1: $\mu > 50$

Z-Value	P-Value
2.84	0.002

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Conclusion –

1) The Z test statistic of 2.84 is greater than the critical value of 2.33. Reject the null hypothesis, there is a 1% chance that Type 1 error has been committed.
2) The hypothesized value of Mu = 50 does not fall within the confidence interval lower bound of 51.47 pounds.
3) P-value .002 is < α .01 = Reject Null.

Interpretation –

The statistics show that manufactures claims that the trash bags could hold more than 50 pounds has been proven to hold significantly more than claimed.

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