

EXPERIMENT -12

Hypothetical using Z-Test

Aim:

To test whether the average weight of species of bird differs from 150 grams

Procedure:

- Null hypothesis
- Alternative hypothesis
- Sample
- Z-Test
- Decision Rule

Program:

```
 1 import numpy as np
 2 import scipy.stats as stats
 3 sample_data = np.array([152, 148, 151, 149, 147, 153, 150, 148, 152,
 4 149, 151, 158, 149, 152, 151, 148, 150, 152, 149, 150, 148, 153, 151,
 5 150, 149, 152, 148, 151, 150, 153])
 6 mean=150
 7 sample_mean=np.mean(sample_data)
 8 std=np.std(sample_data,ddof=1)
 9 n=len(sample_data)
10 z_stat=(sample_mean-mean)/(std/np.sqrt(n))
11 p_value=2*(1-stats.norm.cdf(np.abs(z_stat)))
12 print(f"Sample Mean: {sample_mean:.2f}")
13 print(f"z-Statistic: {z_stat:.4f}")
14 print(f"p-value: {p_value:.4f}")
15 alpha=0.05
16 if p_value<alpha:
17     print("Reject the null hypothesis: The average weight is significantly different from 150 grams")
18 else:
19     print("Fail to reject the null hypothesis: There is no significant difference in average weight from 150 grams.")

Sample Mean: 150.28
z-Statistic: 0.6406
p-value: 0.5218
Fail to reject the null hypothesis: There is no significant difference in average weight from 150 grams.
```

Result:

Thus the python program for doing hypothetical test using Z-Test is executed and output is verified successfully