

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:

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

Sample Mean: 150.20
z-Statistic: 0.6486
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