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:

```
import numpy as np
import scipy.stats as stats
sample_data = np.array([152, 148, 151, 149, 147, 153, 150, 148, 152,
149,151, 150, 149, 152, 151, 148, 150, 152, 149, 150,148, 153, 151,
150, 149, 152, 148, 151, 150, 153])
mean=150
sample_mean=np.mean(sample_data)
std=np.std(sample_data,ddof=1)
n=len(sample_data)
z_stat=(sample_mean-mean)/(std/np.sqrt(n))
p_value=2*(1-stats.norm.cdf(np.abs(z_stat)))
print(f"Sample Mean: {sample_mean:.2f}")
print(f"z-Statistic: {z_stat:.4f}")
print(f"P-value: {p_value:.4f}")
alpha=0.05
if p_value<alpha:
  print("Reject the null hypothesis:The average weight is significantly different from 150 grams")
else:
  print("Fail to reject the null hypotheis:There is no significant difference in average weight from 150 grams.")
```

```
Sample Mean: 150.20
z-Statistic: 0.6406
P-value: 0.5218
Fail to reject the null hypotheis: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