In [1]: `#12`

```python
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])

population_mean = 150

sample_mean = np.mean(sample_data)
sample_std = np.std(sample_data, ddof=1)


n = len(sample_data)

z_statistic = (sample_mean - population_mean) / (sample_std /
np.sqrt(n))


p_value = 2 * (1 - stats.norm.cdf(np.abs(z_statistic)))


print(f"Sample Mean: {sample_mean:.2f}")
print(f"Z-Statistic: {z_statistic:.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 diffe
else:
  print("Fail to reject the null hypothesis: There is no significant differenc
```

```
Sample Mean: 150.20
Z-Statistic: 0.6406
P-Value: 0.5218
Fail to reject the null hypothesis: There is no significant difference in avera
ge weight from 150 grams.
```