Exercise-13

November 2, 2025

[1]:
```
import numpy as np
import scipy.stats as stats
```

[2]:
```
np.random.seed(42)
```

[3]:
```
sample_size = 25
sample_data = np.random.normal(loc=102, scale=15, size=sample_size)
```

[4]:
```
population_mean = 100
sample_mean = np.mean(sample_data)
sample_std = np.std(sample_data, ddof=1)
```

[5]:
```
n = len(sample_data)
```

[6]:
```
t_statistic, p_value = stats.ttest_1samp(sample_data,population_mean)
print(f"Sample Mean: {sample_mean:.2f}")
print(f"T-Statistic: {t_statistic:.4f}")
print(f"P-Value: {p_value:.4f}")
```

```
Sample Mean: 99.55
T-Statistic: -0.1577
P-Value: 0.8760
```

[8]:
```
alpha = 0.05
if p_value<alpha:
    print("Reject the null hypothesis: The average IQ score is significantly␣
 ↪different from 100")
else:
    print("Fail to reject the null hypothesis: There is no significant␣
 ↪difference in average IQ score from 100")
```

```
Fail to reject the null hypothesis: There is no significant difference in
average IQ score from 100
```

[ ]:
```

```