In [1]:
```
import matplotlib.pyplot as plt
import seaborn as sns
import numpy as np
import scipy.stats as stats
import statistics
import math
import sys
```

In [2]:
```
tips = sns.load_dataset('tips')
```

In [3]:
```
tips.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 244 entries, 0 to 243
Data columns (total 7 columns):
 #   Column      Non-Null Count  Dtype   
---  ------      --------------  -----   
 0   total_bill  244 non-null    float64 
 1   tip         244 non-null    float64 
 2   sex         244 non-null    category
 3   smoker      244 non-null    category
 4   day         244 non-null    category
 5   time        244 non-null    category
 6   size        244 non-null    int64   
dtypes: category(4), float64(2), int64(1)
memory usage: 7.4 KB
```

In [4]:
```
tips.head()
```

Out[4]:

	total_bill	tip	sex	smoker	day	time	size
0	16.99	1.01	Female	No	Sun	Dinner	2
1	10.34	1.66	Male	No	Sun	Dinner	3
2	21.01	3.50	Male	No	Sun	Dinner	3
3	23.68	3.31	Male	No	Sun	Dinner	2
4	24.59	3.61	Female	No	Sun	Dinner	4

Using statistics library

In [5]:
```
total_bill_mean = statistics.mean(tips['total_bill'])
total_bill_median = statistics.median(tips['total_bill'])
total_bill_std_dev = statistics.stdev(tips['total_bill'])
print(f"Mean total bill: {total_bill_mean:.2f}")
print(f"Median total bill: {total_bill_median:.2f}")
print(f"Standard deviation of total bill: {total_bill_std_dev:.2f}")
```

```
Mean total bill: 19.79
Median total bill: 17.80
Standard deviation of total bill: 8.90
```

Using math library

In [6]:
```
num = int(input("Enter a no. to find its square-root: "))
sqr = math.sqrt(num)
print(f"Square root of {num}: {sqr}")
```

```
Enter a no. to find its square-root: 25
Square root of 25: 5.0
```

Using numpy library

In [7]:
```
tips['total_bill_squared'] = np.square(tips['total_bill'])
print("First 5 entries of total bill squared:")
print(tips['total_bill_squared'].head())
```

```
First 5 entries of total bill squared:
0    288.6601
1    106.9156
2    441.4201
3    560.7424
4    604.6681
Name: total_bill_squared, dtype: float64
```

Using sys library

In [8]:
```
print("System information:")
print(f"Python version: {sys.version}")
print(f"Maximum integer size on this system: {sys.maxsize}")
```

```
System information:
Python version: 3.9.12 (main, Apr  4 2022, 05:22:27) [MSC v.1916 64 bit (AMD64)]
Maximum integer size on this system: 9223372036854775807
```

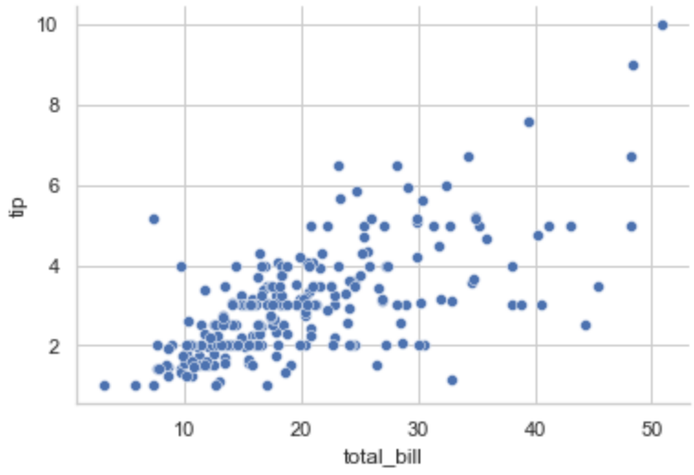
Using Scipy library for t-test

In [12]:
```
smoker_yes = tips[tips['smoker'] == 'Yes']['total_bill']
smoker_no = tips[tips['smoker'] == 'No']['total_bill']

t_statistic, p_value = stats.ttest_ind(smoker_yes, smoker_no)

print("T-statistic:", t_statistic)
print("P-value:", p_value)

alpha = 0.05

if p_value < alpha:
    print("Reject the null hypothesis. There is a significant difference between group
else:
    print("Fail to reject the null hypothesis. There is no significant difference betw
```

```
T-statistic: 1.3384363834700073
P-value: 0.1820103288430244
Fail to reject the null hypothesis. There is no significant difference between group
s.
```

Using Seaborn library for visualization

In [10]:
```
sns.set(style="whitegrid")
sns.scatterplot(x='total_bill', y='tip', data=tips)
sns.despine()
```



In [ ]: