Lab 7 Solutions

PSTAT 5A, compiled by Ethan

May 17, 2023

1 Task 1

Part (a)

[1]:
```
import scipy.stats as sps
```

[2]:
```
sps.t.ppf(0.1, df = 31)
```

[2]:
```
-1.3094635471008582
```

Part (b)

[3]:
```
sps.t.ppf(0.005, df = 11)
```

[3]:
```
-3.1058065132211015
```

2 Task 2

From the help file, the arguments that the function `sps.t.ppf()` takes are:

- `q`
- `df`
- `loc` (default value of 0)
- `scale` (default value of 1)

3 Task 3

[4]:
```
import numpy as np
import random as rnd

def dice_roll(num_sides = 6, num_rolls = 1):
  return rnd.choices(np.arange(0, 7), k = num_rolls)
```

[5]:
```
dice_roll(12, 5) # rolling a 12-sided die 5 times
```

[5]:
```
[1, 0, 0, 6, 4]
```

```
[6]: dice_roll(12) # rolling a 12-sided die once
```

```
[6]: [2]
```

```
[7]: dice_roll() # rolling a 6-sided die once
```

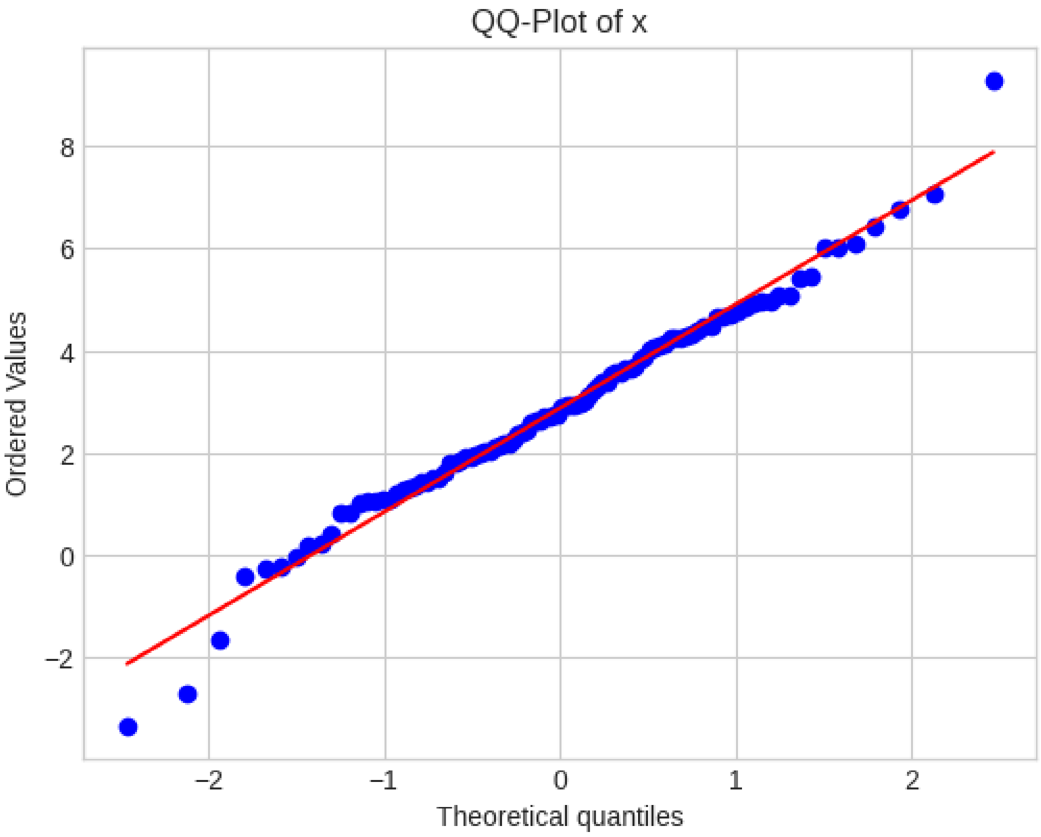
```
[7]: [5]
```

4 Task 4

```
[8]: %matplotlib inline
     import matplotlib
     import matplotlib.pyplot as plt
     plt.style.use('seaborn-v0_8-whitegrid')
```

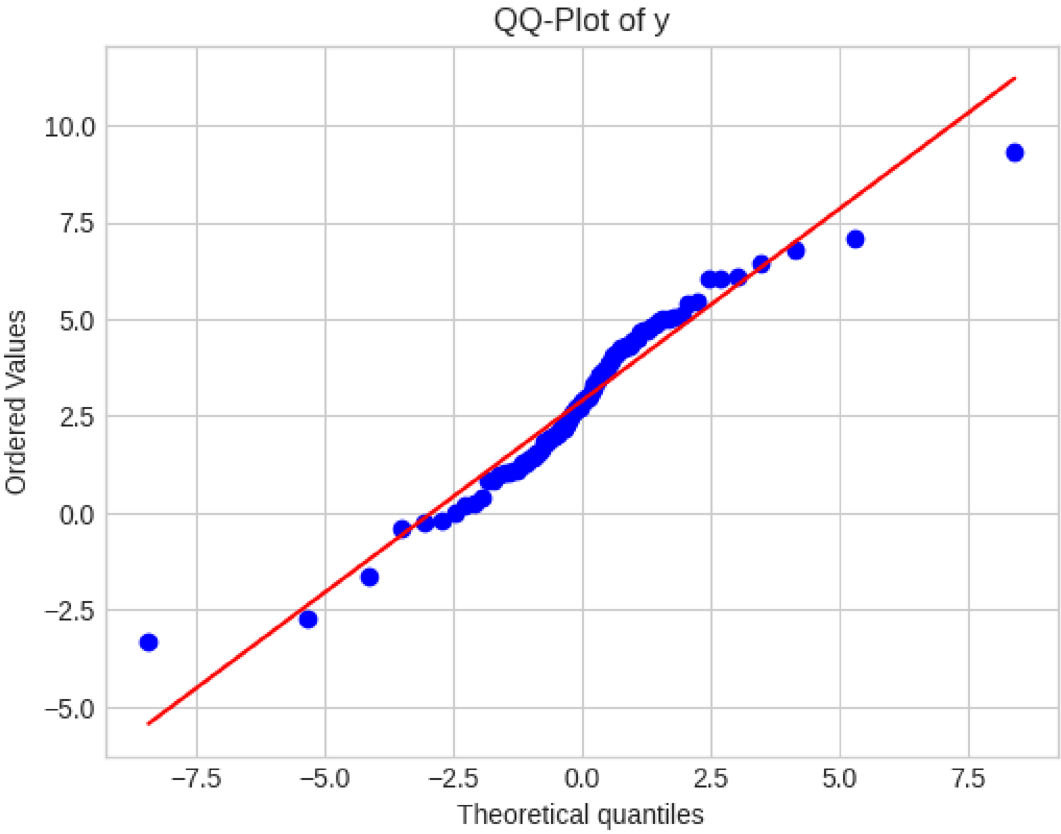
```
[9]: x = sps.norm.rvs(size = 100, loc = 3, scale = 2.1)
     y = sps.t.rvs(size = 100, df = 2)
```

```
[12]: sps.probplot(x, plot = plt);
      plt.title("QQ-Plot of x");
```



[15]:

```
sps.probplot(x, dist = "t", sparams = (2), plot = plt);
plt.title("QQ-Plot of y");
```



Deviations from linearity in the QQ-plot of `y` would lead us to believe that `y` was *not* normally distributed.

[ ]:

```
```