1 Least Squares

x	0	1	2	2.5	3	4
y	0.15	1	0.84	0	-0.2	-0.96

Table 1: This table contains a dataset of pairs (x_i, y_i) for $i = 1, \ldots, 6$ which is used in exercise **??** and 1.

Let the data points (x_i, y_i) for $i = 1, \ldots, 6$ be given as in Table 1.

1. Solve the least squares problem of Exercise **??** in Python using the `lstsq()` function of `scipy.linalg` as presented in the lecture.

2. Plot the data points and the fitted line.

3. You are given the additional information that the data stems from a sine-function of the form $\sin(x)a + b \approx y$, i.e. the adjusted problem then is of the form

$$\min_{a,b} \sum_{i=1}^{6} (\sin(x_i)a + b - y_i)^2.$$

Solve the adjusted problem with the `lstsq()` function.

4. Plot the data points and the fitted curve.

Solution:

```
import numpy as np
```