exponentials

September 29, 2024

Exercises fitting exponential decay data

```python
[17]: import numpy as np
      import matplotlib.pyplot as plt
      from matplotlib import gridspec
      %matplotlib inline
      from scipy.optimize import curve_fit
      import os

      basedir = '/home/david/gh/intro_curve_fitting_python'

      try:
          os.chdir(basedir)
      except:
          print('\n\nproblem changing to the directory you specified; does it exist?
       ↪\nthe kernel will now restart; rerun this program.\n\n')
          quit()
```

In the '.../intro_curve_fitting_python/exponential_data' directory you will find the following files:

```python
[18]: filenames = os.listdir(basedir+'/exponential_data/')
      filenames
```

```
[18]: ['exponential2.csv', 'exponential3.csv', 'exponential1.csv']
```

It should not be too difficult to adapt your work from the linear fitting exercises to these data sets.To get you started, I will define an appropriate fitting function:

$$f(x) = c + A_0 e^{kx}$$

with $k < 0$ assumed.

Note that you will have to customize this function to fit data set 3. If you get stuck with that, check out the notebook with which I created the data, or view it as a webpage.

```python
[19]: def genexpfunc(x, a, k, c):
          return c+a*np.exp(k*x)
```

Your work here:

```python
[ ]:
```

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Non-trivial curve-fitting: thermal denaturations Click here.

[ ]: