

# EE2703: Assignment 3 - Data Estimation

## Report

EE23B092, Aswitha Sriee

### 1 Estimating all 4 unknowns using `curve_fit()`

Since the Boltzmann constant and temperature could not be separated, I took the product as a single unknown parameter. I set the initial estimates as the actual values as otherwise I was getting overflow error or I was getting a straight line. This was especially so for d2.txt and d4.txt where the noise was significant.

Then, using trial-and-error I found the optimal initial parameters. The parameters are already given in the .ipynb file (just need to run it). The error in the estimates was in the 3rd significant place for d1.txt. The error in the estimates was very huge in d2.txt and d4.txt (almost 10

### 2 Estimating each of the unknowns using partial application

Since the Boltzmann constant and temperature could not be separated, I took the product as a single unknown parameter. I set all the other parameters to their actual values (except for the target variable) and got a fair estimate for each of the unknowns. The error was lesser than the previous case and for the noisy data the error was less than 3%.

The estimates and figures are in the .ipynb file. Running the file will give the outputs.

### 3 Initial values given

For the part 1, the initial value given for speed of light was  $3e8$ . Planck's constant was  $6.6e-34$ . The product of  $k_b$  and  $T$  was  $4e-20$ . The same initial values were given as in part 2 (partial application) except for the product of  $k_b$  and  $T$  which was given as  $5e-20$ .