PHY224 Curve Fit Lab 1

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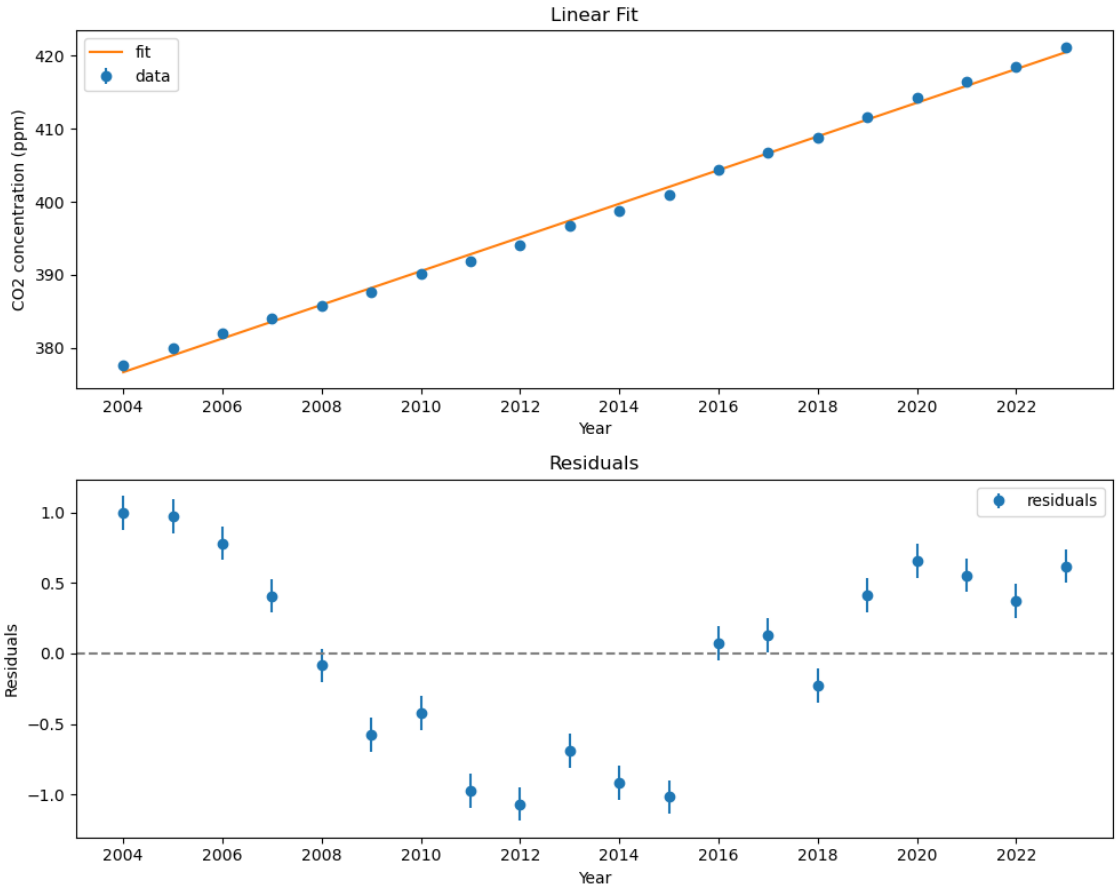

Figure 1: the 2 figures above are the linear data with its line of best fit, and the corresponding residuals for each dataset.

in exercise 1, we are given climate data containing the mean atmospheric CO2 content over the last half-century. using this data in a CSV file I plotted the data for the last 20 years, along with

a line of best fit using the linear regression line $f(x) = ax + b$.

from the data, the coefficients calculated were:

$$a = 2.303$$

$$b = -4239$$

$$r^2 = 0.997$$

from the data, it can also be inferred that in 2060, the atmospheric CO_2 levels will be 505.18ppm and in 1960 it was 274.88ppm.

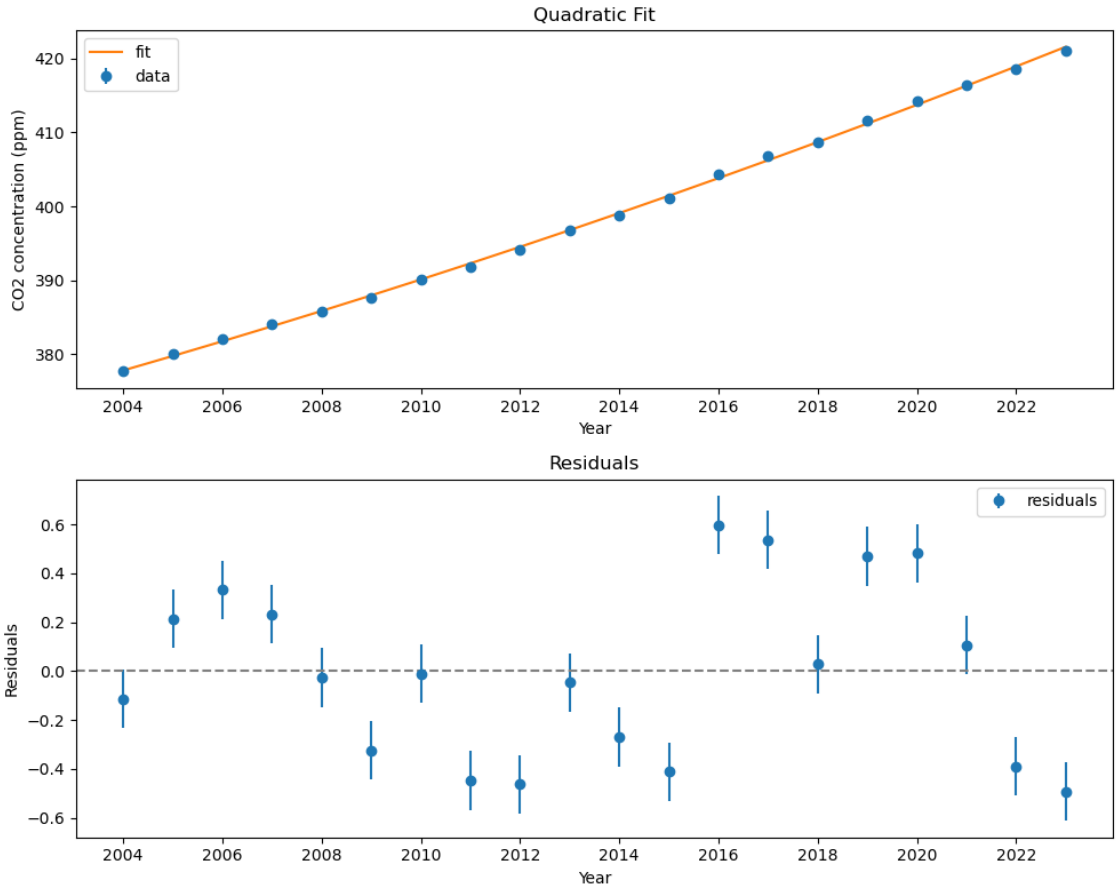

Figure 2: the 2 figures above are the quadratic data with its line of best fit, and the corresponding residuals for each dataset.

the same data set was then fitted into a quadratic graph with equation $ax^2 + bx + c$ as shown above with values obtained as

$$a = 0.19, b = -76.3, c = 74900.0, \chi^2 = 10.18$$

note that this model is more accurate to reality due to its smaller χ^2 value. using this new improved model the data for 2060 and 1960 respectively is 547 and 330 ppm respectively