

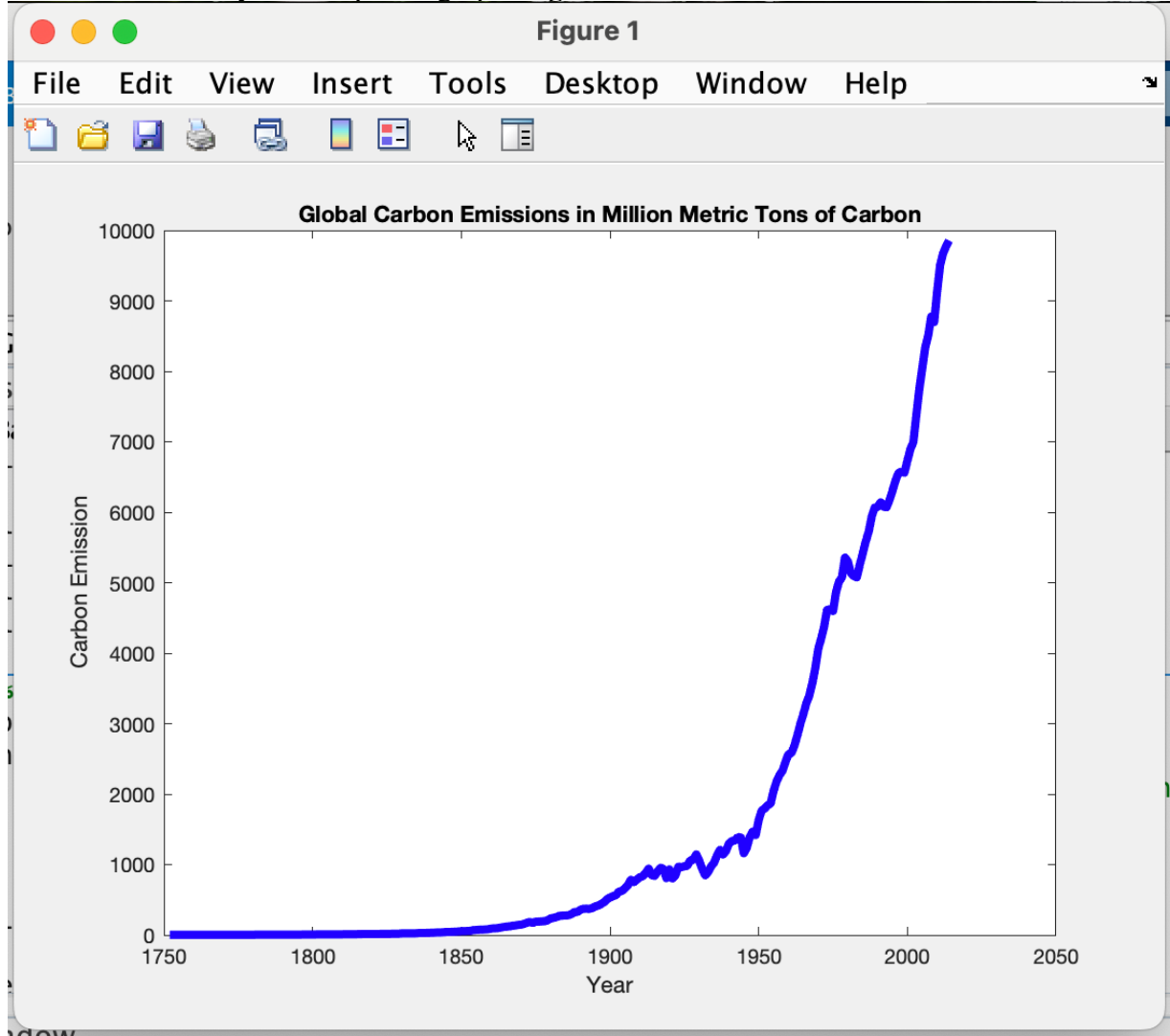
ENGR 231 – Linear Engineering Systems  
Lab 9: Curve Fitting II

Your Name: Cole Bardin Section: 62  
first last

As a convenience, this **answer template** is provided if you wish to easily submit your work. Be sure to save it as a PDF before submitting online!

**Part A: Carbon Emissions - the Driver Behind Global Climate Change**

**Question 1:** Paste your completed graph of **global carbon emissions** here.

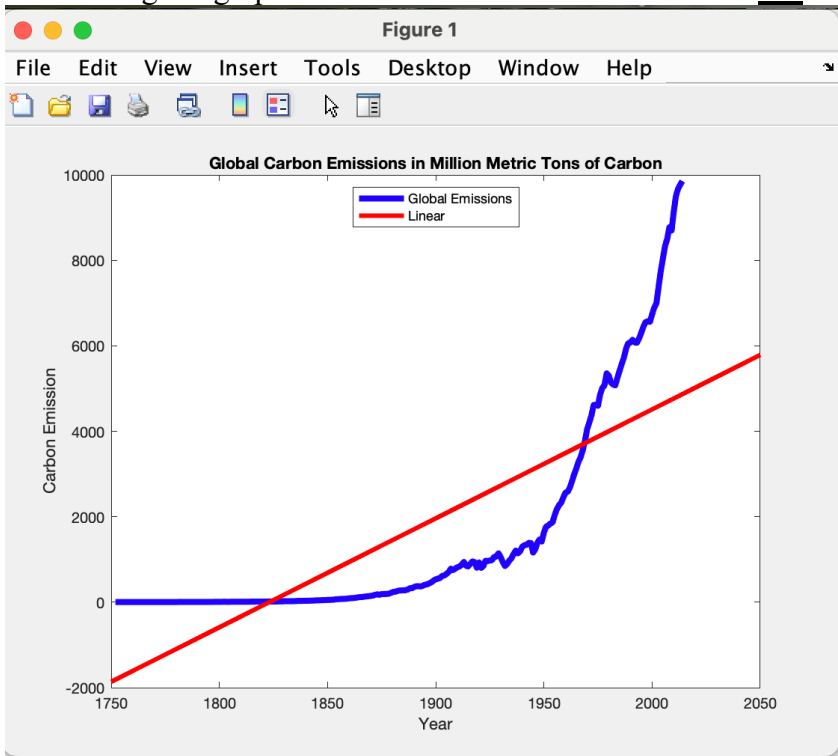


**Question 2:** The value of  $D2 = D' * D$  is  $D2 = \begin{bmatrix} 263 & 0 \\ 0 & 1515932 \end{bmatrix}$

**Hint:** Diagonal matrix with integer coefficients.

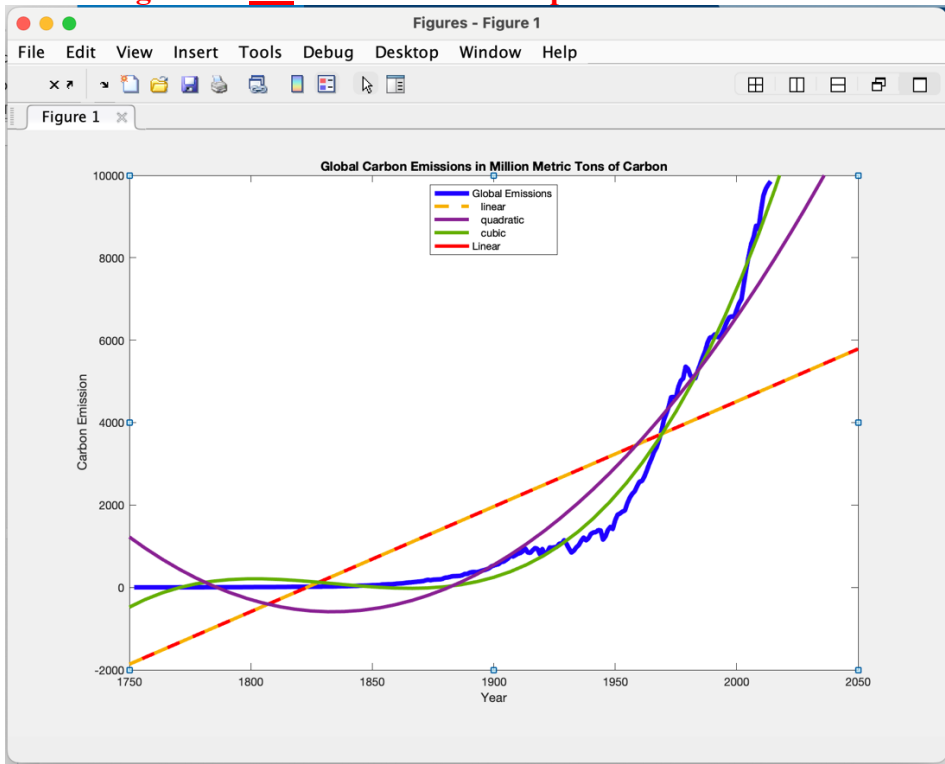
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**Question 3:** Replace the sample graph below with your completed graph showing both your best-fit line and the original graph of the **carbon** emissions data. Must **not** show the oil droplets.



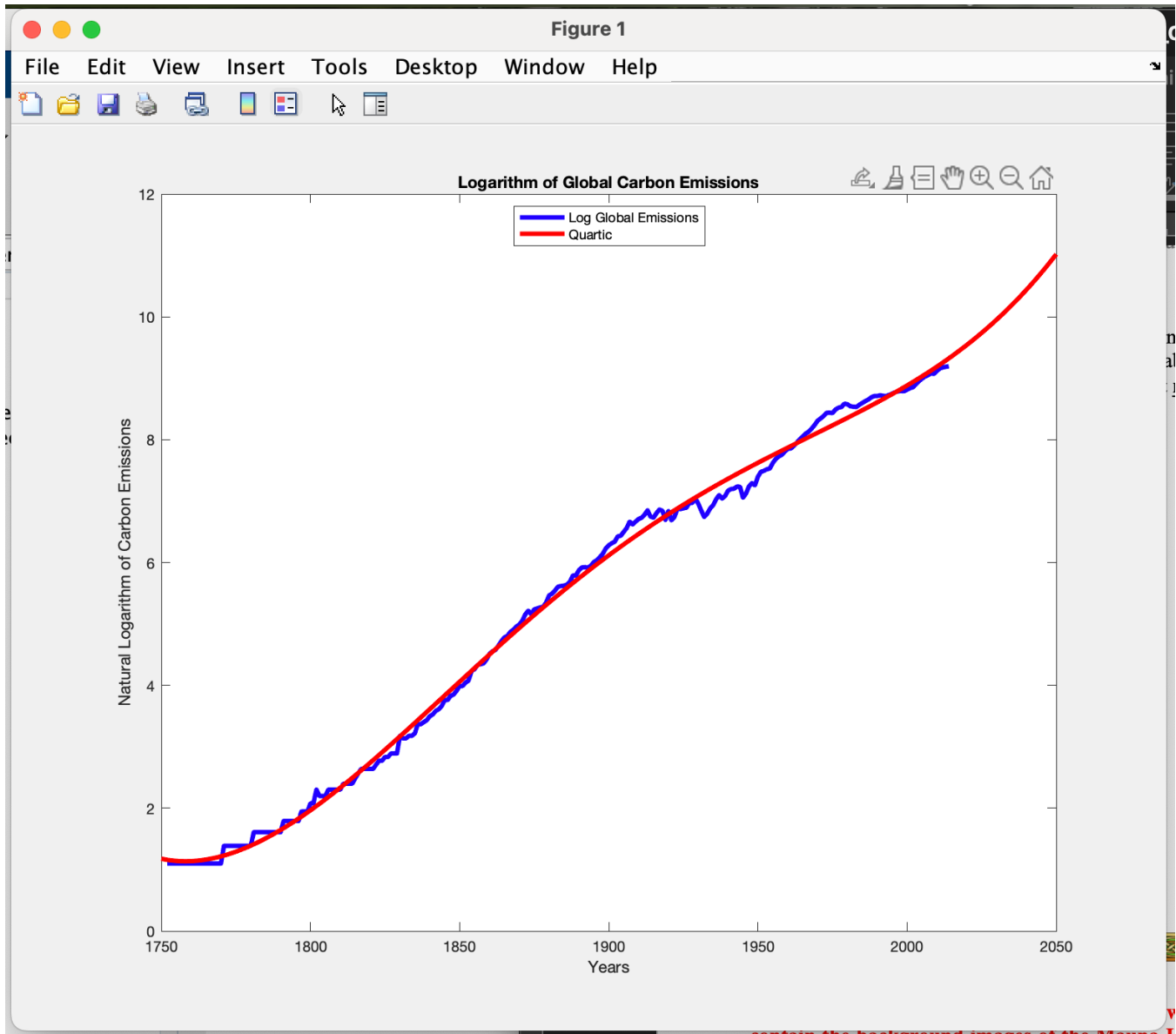
**Question 4:** Paste in your completed figure showing the new **linear**, **quadratic** and **cubic** fits. Notice the new linear fit lies exactly atop the line we found using least squares. So, there are two linear fits.

**Your image must not include the oil droplets.**



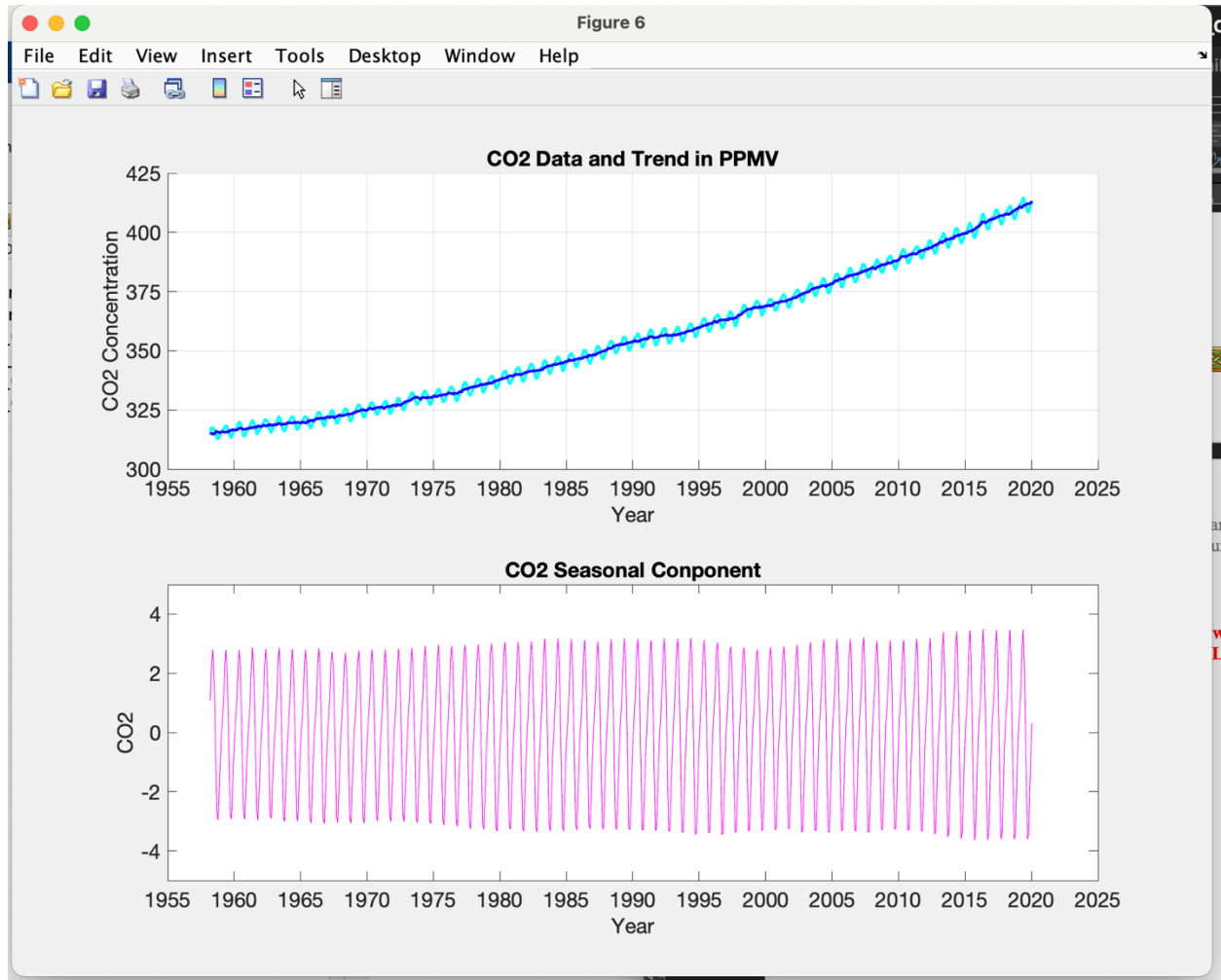
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**Question 5:** Paste in your completed figure showing the **natural log of global carbon emissions** and the best-fit **quadratic** in **red**. This should be a reasonable fit. If you did the challenge, you may paste in your **quartic** fit instead. Up to you. Your solution must **not** include the oil droplets.



## Part B: The Keeling Curve

**Questions 6-7:** Replace the sample graph below with your completed plot. Your image must not contain the background images of the Mauna Loa Observatory. Include both the top and bottom tile.

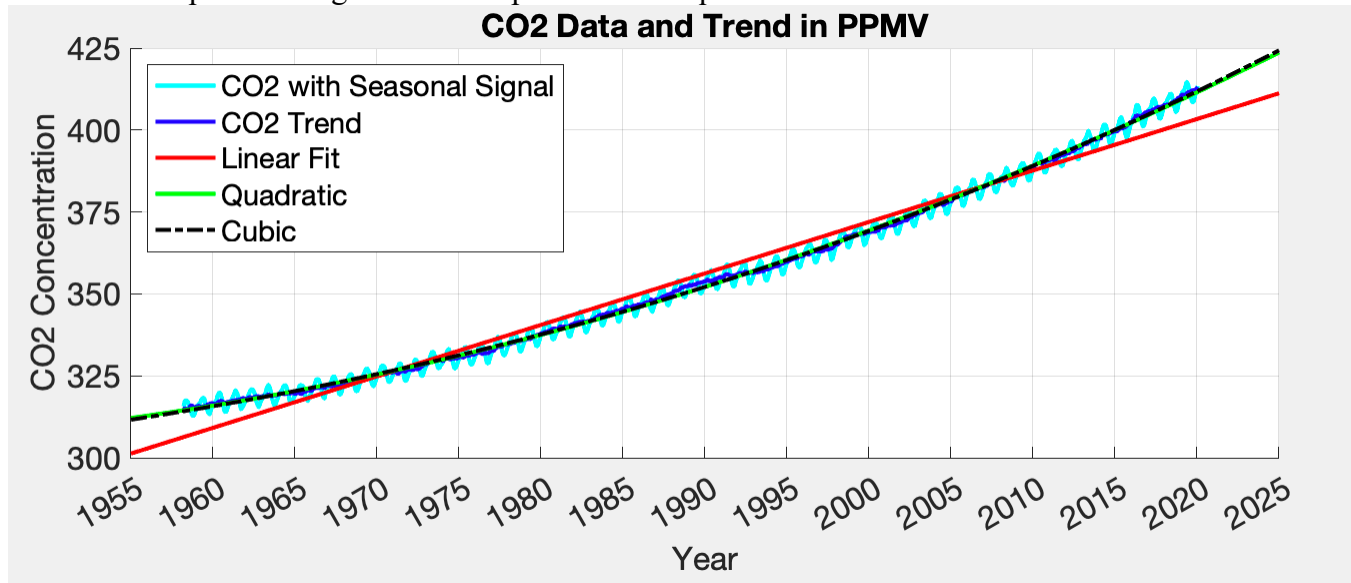


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**Questions 8-10: Linear, Quadratic and Cubic Fits**

Paste in just the top tile, showing the CO<sub>2</sub> and trend data and three best-fits: **linear**, **quadratic** and **cubic**. Be sure to include a **legend** as shown in the sample.

**Grader:** One point for legend and two points if both quadratic and cubic fit are shown.



**Ready to Submit?**

Be sure all ten questions are answered. When your lab is complete, be sure to submit three files:

1. Your **completed Answer Template** as a PDF file
2. A copy of your **MATLAB Live Script**
3. A **PDF** copy of your **MATLAB Live Script** (Save-Export to PDF...)

The due date is the day after your lab section by **11:59pm** to receive full credit. You have one more day, to submit the lab (but with a small penalty), and then the window closes for good and your grade will be zero.