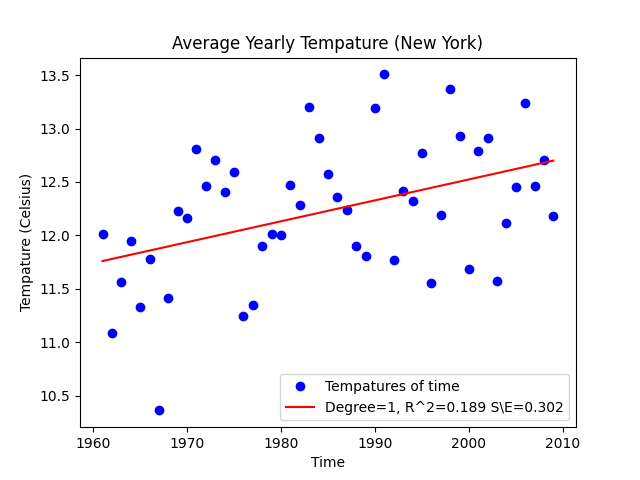
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
Figure 4.I

  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
Figure 4.II

\*\*Full sized figures found in ./plots directory\*\*

Question: What difference does choosing a specific day to plot the data versus calculating the yearly average have on our graphs (i.e., in terms of the R^2 values and the fit of the resulting curves)? Interpret the results.

Answer: Are R^2 value is slightly better taking the average of a year, and taking the yearly average does seem to reduce the noise in the data.

Question: Why do you think these graphs are so noisy? Which one is more noisy?

Answer: The graphs are noisely mainly due to the unpredictablility and randomness of nature, weather is not an easy thing to predict. Figure A.I is slightly more noisey then A.II, I believe that due to the lower R^2 value on our linear fit and the overall shape of the data displayed.

Quesiton: How do these graphs support or contradict the claim that global warming is leading to an increase in temperature? The slope and the standard error to slope ratio could be helpful in thinking about this.

Answer: I don’t think these graphs show very much supporting evidence, due to the low R^2 values, these linear models don’t seem to be a accurate representation of how the weather is increasing, but there certaintly are some upward trends. I believe that more data is needed before any conclusions could be made.

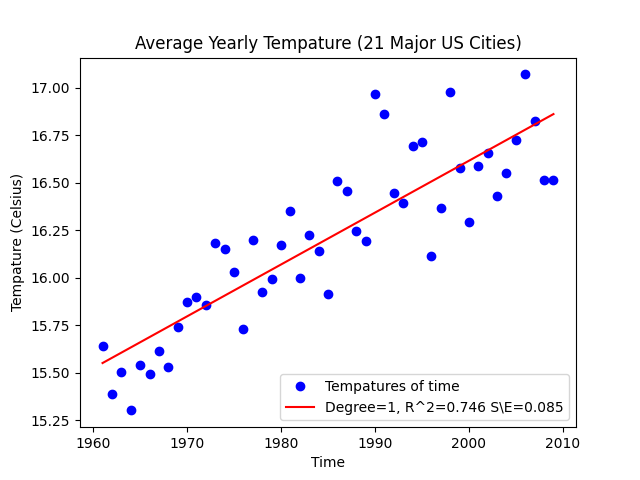


Figure B

Question: How does this graph compare to the graphs from part A (i.e. in terms of the R^2 values, the fit of the resulting curves, and whether the graph supports/contradicts our claim about global warming)? Interpret the results.

Answer: This graphy more closely represents linear growth, as seen by our better fit and higher R^2 value of the first degree model. This graph definitly supports the idea that the earths temperature is rising.

Question: Why do you think this is the case?

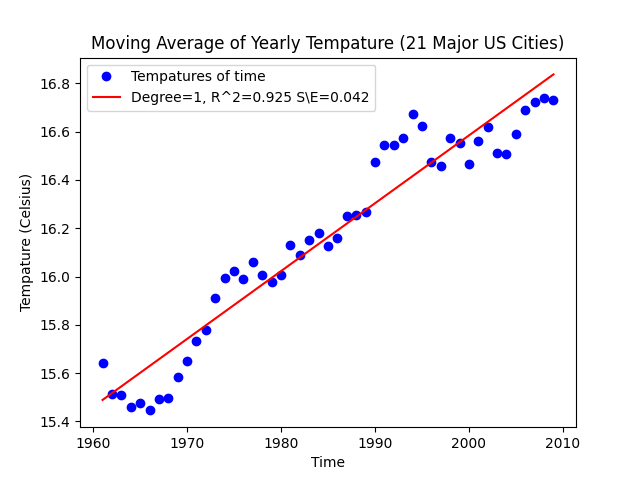
Answer: Well I don’t think that this is definitive proof and it makes me more curious to see this graph with larger sets of data, as in more cities, or perhaps more years.

Question: How would we expect the results to differe if we used 3 different cities? What about 100 differentt cities?

Answer: Im honestly not sure, I think three different cities would closely represent what we found in the first two figures, and I think in one hundred cities we would find more evidince of a rising average.

Question: How would the results have changed if all 21 cities were in the same region of the United Sates (for ex., New England)?

Answer: I think that the noise would probably be less, and would likely show a very linear graph.

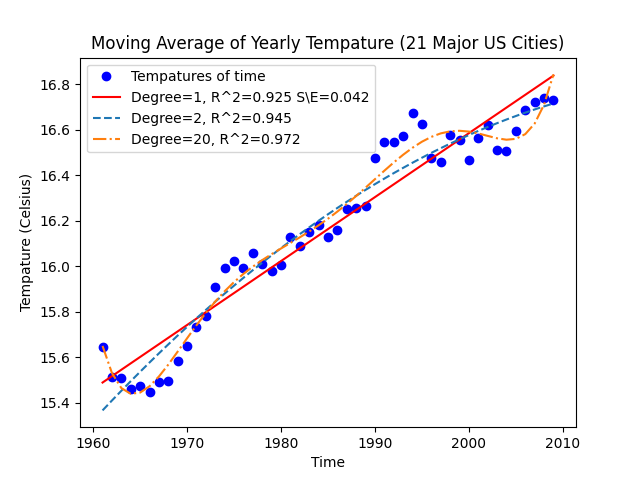
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
Figure C

Question: How does this graph compare to the graphs from part A and B (i.e., in terms of the R^2 values, the fit of the resulting curves, and whether the graph supports/contradicts our claim about global warming)? Interpret the results.

Answer: This graph is the most confident we can be In so far, I don’t believe I am knowledgable enough on the topics of moving average, however given this chart alone, you could conclude that there is a general upwards trend in tempature throughout the united states. However I don’t believe this is definitive proof.

Question: Why do you think this is the case?

Answer: I believe we lack data from the previous thousand years in this data set, that could give us an idea of the long term tempature trends.

  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
Figure D.1

Quesiton: How do these models compare to each other?

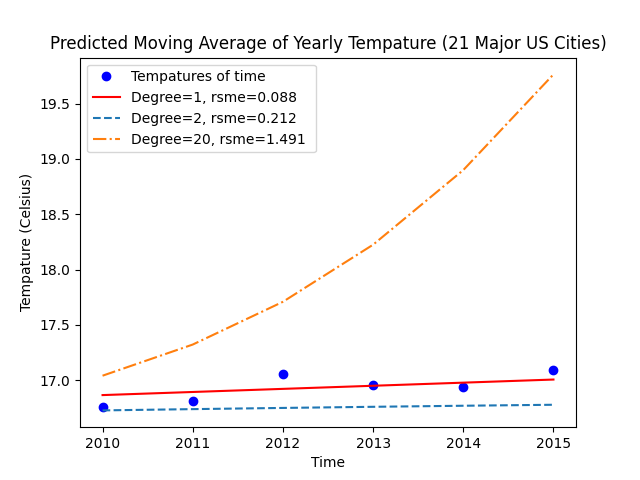
Answer: They are very different in shape, but have very similar R^2.

Question: Which one has the best R^2? Why?

Answer: Degree 20 has the best R^2 value, due to it being a higher degree, it trys to more closely mimick each data point.

Question: Which model best fits the data? Why?

Answer: I believe degree 1 or degree 2, best fit the data, due to their simplicity, the degree 20 is most likely an overfitted polynomial.

  
  
  
  
  
  
  
  
  
  
  
  
  
  
Figure D.2

Question: How did the different models perform? How did their RMSEs compare?

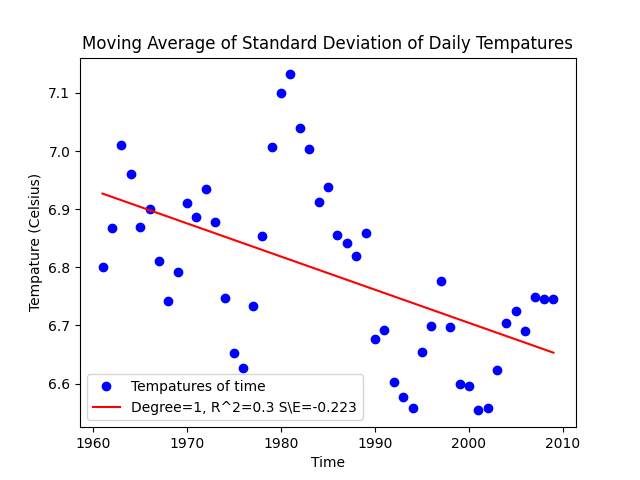
Answer: The second and twentieth degree models performed horribly, while the first degree model held up nicely.

Question: Which model performed the best? Which model performed the worst? Are these the same as those in part D.1? Why?

Answer: The first degree model peformed the best, while the twentieth degree model performed the worst. Techinally no they are not the same peformers, but I figured atleast the twentieth degree would not accurately predict the data.

Question: If we had generated the models using the Figure A data (I.e average annual temperature in New York) instead of the 5-year moving average over 22 cities, how would the prediction results 2010-2015 have changed?

Answer: I believe they would have been rather poor predictions, as the confidince in the model in that Figure was not very good.

  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
Figure E

Question: Does the result match our claim (i.e., temperature variation is getting larger over these years)?

Answer: Not from what I have found, it seems to be an opposite trend.

Question: Can you think of ways to improve analysis?

Answer: More training data.