Homework 5

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1 PROBLEM 1A

What are the best-fit values of the parameters?
Amplitude : −9.96
Phase : −0.235
Offset : 9.26

2 PROBLEM 1B

What is the overall average temperature in Munich, and what are the typical daily average values predicted by the model for the coldest and hottest time of the year?
Overall average temperature : 9.26 ° C
Daily Average Coldest Temperature : −0.121° C
Daily Average Hottest Temperature : 19.15° C

3 PROBLEM 1C

What is the meaning of the b parameter, and does its value make sense? The b parameter is the phase of the cosine function that is fitted to the data, that is its shift along the x-axis from a "perfect" cosine function. For the best-fit model, it is about $\frac{1}{27}$ of one cycle (2π). Since the data is taken daily each year, 0 radians corresponds to Jan 1 and 2π to Jan 1 of the next year. A bigger phase would indicate that the model predicts a starting day other than Jan 1 (or close to Jan 1). The phase predicted by this model is small, hence it makes sense.