

FST Sinusoidal Modeling Project

55 Assessment Points: Submit Assessment-Quality Work.

Part I: Trigonometric Functions in Images [32 points]

Time to be creative! Find three images which contain components that can be modeled with the trigonometric functions, **one each** for sine, cosine AND tangent. Full points will be awarded for images photographed BY YOU. No photos may be 'staged' as discussed in class. Photos used from an internet search will only be awarded a maximum of 7 points out of 10.

In a Publish View Document, import these images into a graph page and write a model. Don't forget to include an **introduction** to this section of the project and explain the background behind your picture (what it is and where taken). You will need to explain exactly what feature of the image is being modeled (i.e. the ruffle on the curtain as a sine function or a part of a tree branch as a tangent function) – as well as show **HOW** you came up with your non-regression model. Insert a textbox to show in detail how you determined the amplitude, period, phase shift, and vertical translation – show calculations done to get these values. Your labeled calculations should be detailed enough that no written explanation is needed. Models found by guess-and-check will not earn any points.

Points will be awarded on following the directions outlined above, general accuracy of your model (graph model with picture), and clarity of your labeled calculations that detail how your model was found.

Part II: Real World Data Modeled with Sinusoidal Functions [18 points]

We have talked in class about a variety of real-world situations that are periodic. Your task is to use the average high and low temperature data at www.usclimatedata.com for a U.S. city of your choice, find and explain the models in context, and communicate your findings in the Publish View Document. Keeping in mind that mathematical models help us not only to explain real-life phenomena but also to predict outcomes, you will use your model to write and answer questions about your scenario.

Make sure to write an **introduction** to this section of the project, including WHY you chose that particular city. Include an **image** relevant to your city. Include at least **one hyper link** to information relevant to weather information about your city as well as a **hyper link** to your data. A bonus point may be earned for including a video relevant to the cycles of weather in that part of the country. (Include the actual video – not a hyperlink to the video.)

AVERAGE HIGH TEMPERATURE:

- (1) Show your spreadsheet and scatterplot.
- (2) Identify your independent/dependent variables and what symbols you use to identify each.
- (3) Determine a **regression** model for your data. The model should be graphed on a separate copy of the scatterplot. Discuss the fit of the model.
- (4) Write and use your model to answer a question appropriate for your scenario. Show how you determined your answer. Identify as either interpolation or extrapolation.

AVERAGE LOW TEMPERATURE:

- (1) Show your spreadsheet and scatterplot.
- (2) Identify your independent /dependent variables and what symbols you use to identify each.
- (3) The model should be graphed on a separate copy of the scatterplot. Discuss the fit of the model.
- (4) Write and use your model to answer a question appropriate for your scenario. Show how you determined your answer. If question you wrote in part A required interpolation, write a question that requires you to extrapolate. If the question you wrote in part A required extrapolation, write a question that requires you to interpolate.

MLA Format/ Publish View Layout & Features [5 pts.] See rubric for details.

NAMES: _____

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Your project is to be turned in ELECTRONICALLY [I:/MMSTC/Homework/FST/Sinusoidal_Project] and a printed copy is to be turned in with this rubric paper clipped on top. Projects values determined by quality and criteria. Name file: 10X_Lastname_Lastname (replace "X" with section and names in alpha order)

Part I:

Function	Score	Comments
Intro / Closing [2 pts.]		
Sine [10 pts.]		
Cosine [10 pts.]		
Tangent [10 pts.]		

Part II:

Steps	Score	Comments
Intro / Links / Picture [2 pts.]		
Avg. High Temp [8 pts.]		
Avg. Low Temp [8 pts.]		

Proper MLA Format / Mastery of Publish View Layout/Features*

[5 pts.]		
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*Includes inserting images, using active applications (not screenshots), textboxes, spreadsheets, data & statistics pages, hyperlinks, etc. Figures & tables properly labeled. Layout on page is good use of space, shows relevant information and helps to tell story. No paragraph begins with a figure.