

---

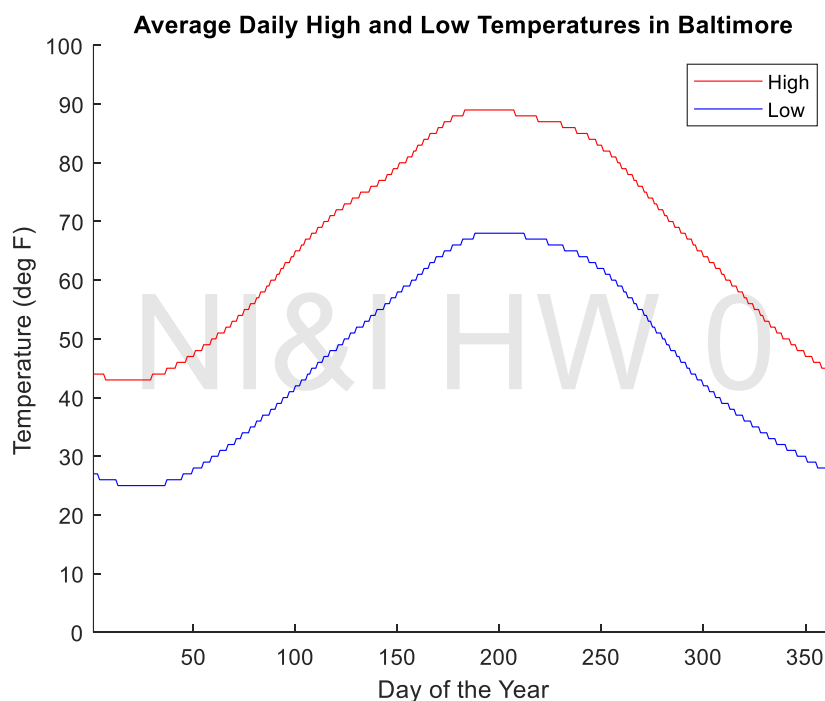
**Homework 0: Introduction to MATLAB DUE MONDAY 1/30/2023 11:59PM**

The purpose of this assignment is to refamiliarize yourself with MATLAB, as most of the future assignments require implementing models or analyzing data in MATLAB. You can obtain a free copy of MATLAB from the JHU Software center. Instructions to access this download can be found [here](#). This assignment will also set our expectations for how you should format and submit future assignments.

There is an accompanying .mat file containing the data for this assignment. You should download this file and move it to your active MATLAB directory. Then, open a new script and use the **load** function to load the data. This file contains a variable that represents the number of days in a year (numDinY), a variable that represents the number of months in a year (numMinY), an array of the number of days in each month (numDinM), an array of the average high daily temperatures in Baltimore (H), and lastly an array of the daily low temperatures in Baltimore (L). As you'll notice, this data has nothing to do with neural implants or interfaces. The focus of this assignment is that you complete the tasks below programmatically. For example, in Part III, when you are asked to find how many values in an array exceed a certain value, don't just look at the array and count yourself. You should use the built-in function(s) to find the answer. If you don't know how to use a function, check the documentation on [Mathworks](#), or type "doc x" or "help x" in the Command Window (leave out the quotations and exchange the x for the name of the function).

**Part I: Plot Formatting**

Recreate the figure below using the provided data. Everything should be the exact same, except you should leave out the gray watermark text in the background.



You should:

1. Create a figure with the low temperature for each day plotted as a blue line and the high temperatures for each day plotted as a red line. Function hints – **figure, plot, hold**.
2. Scale the axes so that the y-axis goes from 0 to 100 degrees F and the x-axis goes from 1 to 365 days. Function hints – **axes** or **xlim, ylim**.
3. Label the x and y axes appropriately. Include units when appropriate. Function hints – **xlabel, ylabel**.
4. Add the title. Function hint – **title**.
5. Add a legend to distinguish which line is which. Function hint – **legend**.

### Part II: for Loops

Use a loop to find the mean average daily low temperature for each month using a pre-allocated array. You should leave a line unsuppressed so that the array of mean temperatures shows as an output in the command window. Function hints – **for, if, mean**

### Part III: Finding Values in an Array

1. How many days are there in a year with an average daily high temperature greater than or equal to 50 degrees F?
2. On what number day(s) of the year does the hottest/highest average daily high temperature occur?

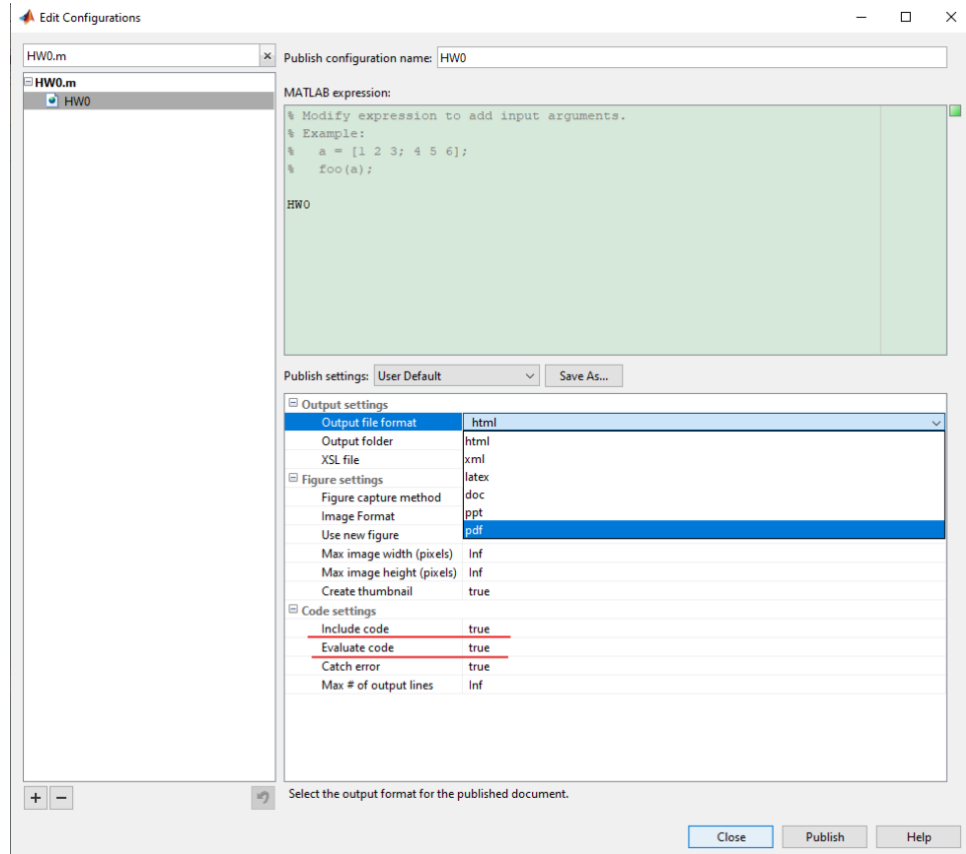
Again, you should leave a line unsuppressed for each question so that your answers display in the command window. Function hints – **find, length, max**.

### Part IV: Publishing

For this assignment and all future assignments, you will be required to submit a single pdf document that includes your code. If you have pages coming from multiple sources (e.g, scanned handwritten work, Word documents, MATLAB code), you should merge them into one pdf. Make sure you clearly label your answers within the pdf. The code must be submitted as “searchable” text so that it can be processed by Turnitin. The best way to do this is to use the Publish feature in MATLAB.

1. Before you publish this code, go back and add section breaks before the code that corresponds to each part. This can be achieved by adding “%% Part x” (leave out the quotations and exchange the x for the correct numeral), where you’d like to add the section break.
2. Go back and also make sure that you have a title for your script. On the first line add “%% NI&I HW0 2023”.
3. Add your name to the second line using a single “%” to comment in your name.
4. Scroll through your code and verify that none of your lines go past the vertical line to the right. If they do, these lines will be cutoff in the output document. You can use “...” to break the text at a reasonable point and then you are able to continue the same statement on the next line. For this and future assignments, we won’t be able to grade your code if it’s cut off.

- Once you have completed the above parts and are satisfied with your results, you are ready to publish your code. Open the Publish tab at the top of the MATLAB window, and select the downwards pointing arrow of the Publish button on the toolbar. Select “Edit Publishing Options...” in the drop-down menu. In this new window, click on the box containing “html” next to “Output file format”. Select the “pdf” option. Make sure the “Include code” and “Evaluate code” settings are set to “true”. Then, press the “Publish” button.



- Submit this pdf to Canvas with the filename “LASTNAME FIRSTNAME HW0 NI&I 2023”. You do not need to submit the .m file.

#### Additional Notes

- If you prefer to use .mlx files over .m files, that’s fine. Skip #5 above and save your evaluated .mlx file as a pdf.
- In the future, if you are submitting a function for example, you may not want the publishing feature to run the code. In that case, you can set “Evaluate code” to “false”.
- In the future, you may want to select “doc” as the “Output file format” so that your code publishes as a Word document. This way, if you need to type in some additional written responses or add in photos of handwritten work, you may do so before saving the document as a pdf to submit. However, publishing to Word files is currently only supported for PCs. For both PCs and Macs, .mlx files can be exported as Word documents.