Getting started:

*Required Software to run program:*

Python3: https://www.python.org/downloads/

* Download and install the most recent Python release.
* This software was tested and developed on Python version 3.11.1, but it should not make too much of a difference.

Ni MAX: https://www.ni.com/en-us/support/downloads/drivers/download.ni-daq-mx.html

* Download and install the most recent Ni MAX release.
* This software was tested and developed on Ni MAX version 20.0.0f0, but again, it should not make too much of a difference.

Various Python modules:

* Open a command prompt window and run the following command: “pip3 install -r requirements.txt”
* Further reading: https://learnpython.com/blog/python-requirements-file/

IDE: https://vscodium.com/#install

* Download and install the most recent VS Codium release.
* You can use any IDE for opening and editing the program (VS Code, Sublime, etc.), I just happened to use VS Codium for working on the file.

Running the Software:

* Run the file “main.py” to launch the menu and begin navigating the program.
* At present, the menu component and the reaction test/shock selection components are separate. They need to be merged in a specific way – see *Issues to be Resolved* for more information.
* Run the file “TAP Test - Testing.py” (TAP\ Test\ -\ Testing.py) to launch the current iteration of the reaction test with the shock components.
* At present, the Reaction Test is incomplete, due to unresolved issues with what I believe to be font rendering - see *Issues to be Resolved* for more information.
* For a more complete demo, run the files “Spacebar Test.py” (Spacebar\ Test.py) and “Speedometer.py” for separate demonstrations of the reaction test and shock select respectfully.

What has been completed:

* Initializing and filling in the information for an experiment – This functionality has been completed, under the “main.py” file. All of the driver code is in both the “menu.py” and the “backend.py” files.
* Interfacing with the new DAQ card – All of the code to interface with the Ni DAQ card has been completed, under the “shock.py” file. The file also contains documentation and examples for usage.
* The shock selection component – This functionality has been completed, under the “Shock Selection.py” (Shock\ Selection.py) file.
* The reaction test component – This functionality has been completed, under the “Spacebar Test.py” (Spacebar\ Test.py) file.

Issues to be resolved:

* The shock selection and reaction test components need to be merged. The current implementation of this has issues with rendering text and switching between the reaction test and shock selection components.
  + Features to be added that are not currently present:
    - Remind user to press shock button if they have not after some amount of time
    - If the selected shock option is held for longer than a certain amount of time (5 seconds for the moment), stop the shock and display a message
    - The shock dial should only show for as long as button is being pressed.
    - If 4 seconds elapse without the user pressing the space bar, prompt them to release the space bar,
    - If the user releases the space bar too soon, have an error that tells them to press the space bar.
  + At the moment, I am not sure why these issues occur or what can be done to resolve them. It may be an issue with the library I am using to manage these (Pygame), or it may be an issue with something within my code. I am not sure. One (drastic) option would be to start over from scratch and create a merger of the two, using the original shock selection and reaction test components for reference.
* Logging, and outputting all data to a .dat file, needs to be implemented. The current TAP system saves and writes all data to a .dat file in a specific format. This is not particularly difficult – the process of saving data and writing it to a specific file is very easy and very well documented in Python – but it cannot be finished until the shock selection and reaction test are combined and finished. Once the shock selection and reaction test are combined and finished, it will be possible to set up logging and write the data to a file.
* Shocking the user via the shock box and DAQ card needs to be implemented. As with the matter of logging, this cannot be finished until the shock selection and reaction test are combined and finished. The driver code for sending a shock from the DAQ card itself is finished, as is the code that would allow the user to set thresholds in the main menu.

As noted, the main issue to resolve is the matter of the shock selection and reaction test being merged.