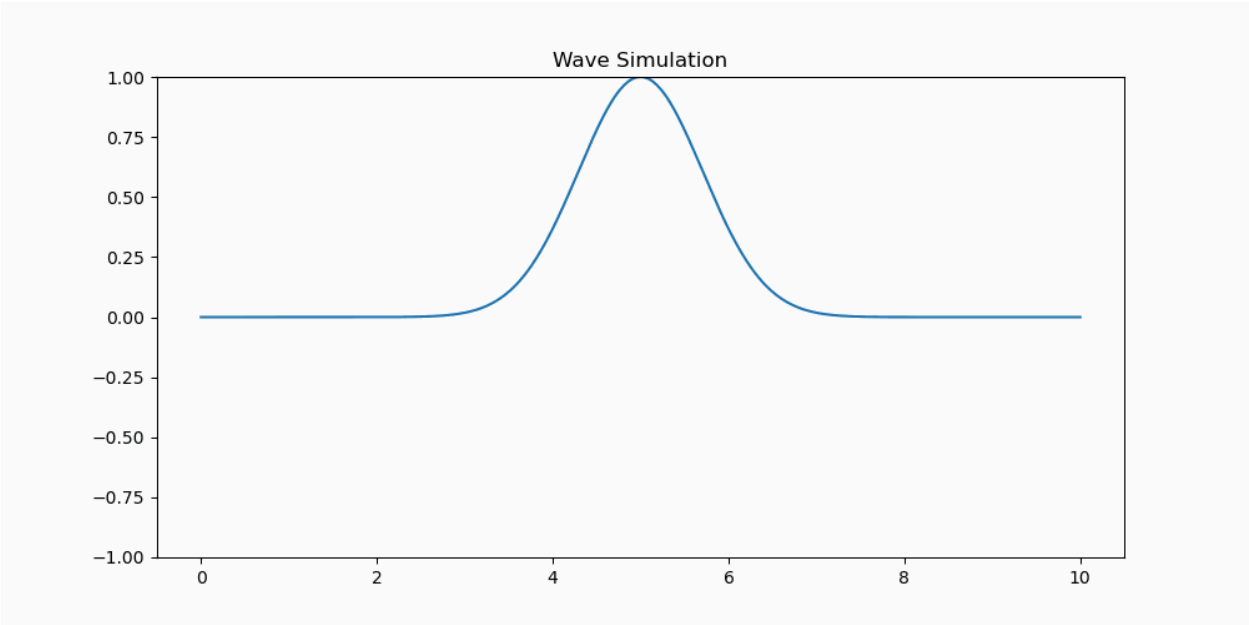

The simulation took, on average, 107.7 seconds to execute the simulation.

I used Python 2.7.16 (my Mac cannot download later versions and the HPCC doesn't allow downloads) within the Jupyter Notebook to implement my 1D wave equation.

To reproduce the results, the instructor will need to pip install matplotlib (for the simulation plots and animation), numpy (for calculations), and pillows (to save the gif). The libraries required are the following: matplotlib.pyplot, matplotlib.animation, numpy, and time.

The timing study was conducted with the following specifications:

```
Software:

    System Software Overview:

      System Version: macOS 10.15.7 (19H2026)
      Kernel Version: Darwin 19.6.0
      Boot Volume: Macintosh HD
      Boot Mode: Normal
      Computer Name: Yudi's MacBook Pro
      User Name: Justin (justin)
      Secure Virtual Memory: Enabled
      System Integrity Protection: Disabled
      Time since boot: 2 days 8:28

Hardware:

    Hardware Overview:

      Model Name: MacBook Pro
      Model Identifier: MacBookPro9,2
      Processor Name: Dual-Core Intel Core i7
      Processor Speed: 2.9 GHz
      Number of Processors: 1
      Total Number of Cores: 2
      L2 Cache (per Core): 256 KB
      L3 Cache: 4 MB
      Hyper-Threading Technology: Enabled
      Memory: 16 GB
      Boot ROM Version: 429.0.0.0.0
      SMC Version (system): 2.2f44
      Serial Number (system): C1MKL0SLDV31
      Hardware UUID: 82B41D97-0692-53E5-9411-D83DC635CE56
      Sudden Motion Sensor:
          State: Enabled
```

I could make this program faster by getting permission to download the necessary software and libraries on the HPCC.