PROJECT S4 ECE 4001/7001 NEURAL MODELS & MACHINE LEARNING

S4-1. The following two software automation tools were recently developed in our Lab by Tyler Banks titled 'SimAgent' and 'VM'. Brief descriptions of each are provided below:

Sim Agent - SimAgent directly interfaces the user's laptop with NSG resources to run NEURON-based network simulations. SimAgent has two core functions, automated job submission and parameter sweep. The automated job submission feature is a point and click interface that accepts any neuron or python program directory, submits the program to run remotely and watches it until completion with live updates to the user. The parameter sweep feature allows the same functionality with the added ability to specify sections of code to automatically change with each run. Users can specify a range of values for a parameter to take on, run each simulation in a parallel configuration and determine the optimal output for their needs. It currently supports connections to the NSG-R restful API and connections using SSH to servers running Slurm.
Videos:
https://youtu.be/ZaqqbNzprAY
https://youtu.be/_AsOgrTj7TE

Virtual Machine (VM) - A pre-built virtual machine with all the tools you need to run large scale NEURON simulations.

Instructions and packages installed can be found here.
https://tylerbanks.net/assets/CompNeuroVMInstructions.pdf

Package installation was achieved using https://github.com/tjbanks/easy-nrn-install

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Your tasks are to:
(i) Understand what each of the tools installed in the VM does and describe it.
(ii) Use the SimAgent tool to run code on NSG (after you get an account on NSG). Use the slides *Steps of Project S4-1.pptx* for guidance.

S4-2. Develop an API to access the Allen Institute Database

Development of Allen API: Peruse the instruction in the notebook *Project_S4-2_AllenAPI.ipynb* and program the automated retrieval of a cell given it's Allen cell ID.