Assignment 1

1.Install OpenSim and Python Scripting

https://opensimconfluence.atlassian.net/wiki/spaces/OpenSim/pages/53085346/Scripting+in+Python

This could be challenging. If you help one student in the class set up Python scripting on their computer, write their name on your assignment and you will get 5% bonus points.

2. Run a Forward Simulation

See the folder ForwardSimulationExample attached with this assignment. Change the pose of the character such that it is in a crouched position (with its knees bent) and its feet touching floor (not floating in the air). Run a 5s forward simulation. You should see the character falling on the floor. Submit your code and a short write-up.

3. Run a Simple Optimization for the Character not to Fall

See the sample file BalanceOptimization.py. You will need to install CMA (pip install cma).
You will see lines with "TODO" indicating what could be changed in the file for the character to stay in balance (and not fall on the floor). How would the simulation look differently if you changed the number of iterations (maxiter) from 8 to 1? You can replay (i.e., visualize) the optimized solution by calling the replay_solution function.
What cost function term could you add for the right toe to get as high as possible? Submit your code and a short write-up.