Follow the steps below to write a Python script to simulate general rigid body motion.

1. Write a Python function:
   - Input arguments: unit screw axis $\mathbf{S} = (\omega, v)$, $\theta > 0$, and initial frame configuration $T_0 \in SE(3)$
   - Output: the end configuration $T_{\text{new}} = e^{[\mathbf{S}]\theta}T_0$

   Test your function with two simple (interpretable) cases of your choice. For each testing case, provide the numerical values of $T_0$, $T_{\text{new}}$, $\mathbf{S}$, and $\theta$, and also plot the frames on the same figure.

2. Use the above function to simulate screw motion. Your codes should be able to work for any given values of: Screw axis $\mathbf{S} = (\hat{s}, h, q)$, speed $\dot{\theta} \in \mathbb{R}$, initial configuration $T_0$, and simulation time steps $t = 0, \Delta t, ..., N\Delta t$. Test your simulation using two different screw axes (non-parallel with any unit axis of $\{s\}$-frame) with different speeds $\dot{\theta}$.

   (a) For each test, please draw the screw axis and the trace of a point $p$ rigidly attached to frame $\{b\}$ with $p_b = (1, 2, 3)$

   (b) Show the frame $T_{sb}(t)$ for a few interesting time steps $t_1, t_2, ...$ on the same plot.

Attach your codes and write a report with good explanations and discussions.