Trajectory Generator Script

```
%% View video at https://youtu.be/uGql9H6G9Q8
% start by defining your inital positons, final position, the standoff
% postion, and the grasp position

TscI = [1 0 0 1; 0 1 0 0; 0 0 1 0; 0 0 0 1]
```

```
TscI = 4×4
     1     0     0     1
     0     1     0     0
     0     0     1     0
     0     0     0     1
```

```
TscF = [0 1 0  0; -1 0 0 -1; 0 0 1 0; 0 0 0 1]
```

```
TscF = 4×4
     0     1     0     0
    -1     0     0    -1
     0     0     1     0
     0     0     0     1
```

```
TseI = [0 0 1 0; 0 1 0 0; -1 0 0 .5; 0 0 0 1]
```

```
TseI = 4×4
         0         0    1.0000         0
         0    1.0000         0         0
   -1.0000         0         0    0.5000
         0         0         0    1.0000
```

```
TceGrasp = [-.854 0 .521 0; 0 1 0 0; -.521 0 -.854 .025; 0 0 0 1]
```

```
TceGrasp = 4×4
   -0.8540         0    0.5210         0
         0    1.0000         0         0
   -0.5210         0   -0.8540    0.0250
         0         0         0    1.0000
```

```
TceStandoff = [-.854 0 .521 0; 0 1 0 0; -.521 0 -.854 .1; 0 0 0 1]
```

```
TceStandoff = 4×4
   -0.8540         0    0.5210         0
         0    1.0000         0         0
   -0.5210         0   -0.8540    0.1000
         0         0         0    1.0000
```

```
k=2; %This sets your number of configs per .01 sec. 2 makes it smooth in the
simulater


%call TrajectoryGenerator to creat an array of T matrixes to accomplish the
%desired task. Output a long list of 13 varables as a CSV in the order:r11, r12,
r13, r21,r22, r23, r31, r32, r33, px, py, pz, gripperstate.
[outputConfigs] = TrajectoryGenerator(TseI,TscI, TscF, TceGrasp, TceStandoff, k)
```

```
outputConfigs = 3000×13
         0         0    1.0000         0    1.0000         0   -1.0000         0 ···
         0         0    1.0000         0    1.0000         0   -1.0000         0
```

```
     0         0    1.0000         0    1.0000         0   -1.0000         0
     0         0    1.0000         0    1.0000         0   -1.0000         0
     0         0    1.0000         0    1.0000         0   -1.0000         0
-0.0000        0    1.0000         0    1.0000         0   -1.0000         0
-0.0000        0    1.0000         0    1.0000         0   -1.0000         0
-0.0000        0    1.0000         0    1.0000         0   -1.0000         0
-0.0000        0    1.0000         0    1.0000         0   -1.0000         0
-0.0000        0    1.0000         0    1.0000         0   -1.0000         0
  ⋮
  ⋮
```