Homework 4

Honor Code: ...

All homework is to be done individually. You are only authorized to receive help from an instructor.

Forward Kinematics

Create a `Jupyter notebook` and this at the top.

```
%matplotlib inline

from __future__ import division, print_function
from matplotlib import pylab
```

1. Write a function that takes in the DH parameters (θ, α, d, a) and returns the homogenious matrix for it.

   ```
   def homogeniousMatrix(theta, alpha, d, a):
       """
       This calculates a homogenious matrix for the given parameters
       """
       ...
       return matrix
   ```

2. Using this function, find the homogenious matrix if:

   1. α is x
   2. θ is x
   3. d is x
   4. a is x

3. Given an array of DH parameters for a robot arm, write a function which takes this and returns a homogenious matrix for the robot arm. Where the array would look like

   ```
   arm = [
       [theta, alpha, d, a],
       [theta, alpha, d, a],
       [theta, alpha, d, a],
       ...
   ]

   def forward(params):
       """
       Given the params, it returns the forward kinematics equations
       """
       ...
       return eqns
   ```

4. Using the previous function, determine the equation for the robot arm with the following DH parameters. *Hint:* your answer should be ....

i	θ_i	α_i	d_i	a_i
1	1	2	3	4
2	1	2	3	4
3	1	2	3	4
4	1	2	3	4