Julia Sterling   **Homework 5**   **Due 10-03-2014**

1. Break the message:

   NHOG REEC OGGO JJW

   knowing it was encoded with an affine cipher and contains the word(s) "silly".

2. Encipher "*Patriots″* using hill the key: a=12, b=23, c=25, d=2. Do the calculation (mod 26).

3. (Wait for Wednesday) Decipher "*OQLV RQ″* using hill with matrix: $\begin{pmatrix} 11 & 24 \\ 12 & 22 \end{pmatrix}$. This calculation is done (mod 29). Note that the mod is different than the previous problem.

4. (Wait for Wednesday) Find all primes p for which $\begin{pmatrix} 3 & 5 \\ 7 & 3 \end{pmatrix}$ (mod p) is *not* invertible.

5. (Wait for Wednesday) Find all values of the b with $0 \leq b < 25$ such that $\begin{pmatrix} 1 & 1 \\ b & 1 \end{pmatrix}$ is invertible (mod 26).

6. Find the One Stop Student Center and take a picture of yourself there and email it to me at cparker@sandiego.edu.

7. Look on the website for sporting events at USD. Choose an event in the future that you would be most likely to attend and write that down. I won't make you actually go to the event but consider doing it, it builds school spirit.