1154-60-1472 **Kseniya Klyachko***, kklyachko@albany.edu. *Random Processes of the Form $X_{n+1} = AX_n + B_n$ (mod p).*

While examining the random process of the form $X_{n+1} = AX_n + B_n \pmod{p}$ where $A = \begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix}$ is a fixed matrix, $B_0, B_1, B_2, ...$ are independent and identically distributed on $\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 \\ 0 \end{bmatrix}$, and $X_0 = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$, we come upon the Fibonacci sequence. Keeping in mind the goal of bounding the rate of convergence of this process to the uniform distribution, we discuss the Fourier Transform and its role in this setting. We also introduce an expansion we call the Fibonary expansion useful in analyzing the Fourier Transform. Generalizing to the random process where $A = \begin{bmatrix} \text{A} & \text{B} \\ \text{C} & \text{D} \end{bmatrix}$, we use the β-ary expansion in analyzing the Fourier transform. To achieve the sought after rate of convergence we restrict A to non-trivial diagonalizable $2x2$ matrices with no eigenvalues of 1 over $\mathbb{C}$, nonnegative integer entries and determinant 1. (Received September 15, 2019)