Homework I

1. (20%) Considering a DSSS system with BPSK modulation over AWGN channel, the applied spreading code is a purely random code, PG = 100 and the received $E_b/N_0 = 0, 1, 2, \ldots, 5$ dB.
   (a) Simulate the BER when the receiver is perfectly synchronized
   (b) Simulate the BER when $\hat{T}_d - T_d = kT_c/10$, for $k = 1, \cdots, 10$
   (c) Simulate the BER when another purely random code is used at the receiver for despreading.
2. (20%) Repeat Problem 1 for a DSSS system with PG = 10. Compare the results with that obtained in Problem 1.
3. (20%) Repeat Problem 1 for an FHSS system with BFSK modulation, PG = 128 and one bit is transmitted per hop. (The synchronization error $\hat{T}_d - T_d$ corresponds to the hop duration for FHSS.)

- Due date: **3/25**, (Submit your report during the class and mail your program to the TA.) Email: TWNTHUCOM5160@gmail.com