## Homework 1

Due on Oct 29. Hand it in to me or TA.

1. Recall the definition of the “Greater Than” function: if and otherwise, where we view x and y as binary representation of two integers in [0, 2n-1]. Show that   
    , and .  
   (Recall that D is the deterministic communication complexity, and R is the private-coin randomized communication complexity.)
2. Use discrepancy bound to prove that for all but an exponentially small fraction of Boolean functions , .
3. Consider three players in the Number-on-the-Forehead model and the input contains three strings . So Player 1 sees (y,z), Player 2 sees (x,z), and Player 3 sees (x,y). The function is defined by . What’s the most efficient communication protocol you can think of?