## Homework 2

Due on Dec 3. Hand it in to me or TA.

1. For a function , the Fourier coefficients, indexed by , is given by , where . Compute (all) the Fourier coefficients of the following functions.

* iff .
* iff not all bits are equal.

1. Recall that certificate complexity of a function on an input is   
      
   where . Further define   
    and .  
   Also recall that is a -CNF if where each is a literal and each . Similarly is a -DNF if where each is a literal and each .   
   Now prove that   
    -DNF} and -CNF}.
2. Prove that Khrapchenko’s bound (Theorem 2.2 in Lecture 5) cannot prove lower bound

* larger than .
* larger than .