Quiz 10 - Hash Functions and Bitwise operators

CS 14 - Data Structures

May 8, 2013

Questions:

1. Calculate the following. Assume all numbers are represented in binary.
   (a) 01110111 ^ 10101010

   (b) ~11001010

2. Calculate the following. Assume all numbers are represented in decimal.
   (a) 123 << 1

   (b) 234 >> 2

3. Given this code:

```
#define BYTE1(x)        0x00000000000000ff & x
#define BYTE2(x)        0x000000000000ff00 & x
#define BYTE3(x)        0x0000000000ff0000 & x
#define BYTE4(x)        0x00000000ff000000 & x
#define BYTE5(x)        0x000000ff00000000 & x
#define BYTE6(x)        0x0000ff0000000000 & x
#define BYTE7(x)        0x00ff000000000000 & x
#define BYTE8(x)        0xff00000000000000 & x

#define HASH_256(x)     BYTE1(x) ^ BYTE2(x) ^ BYTE3(x) ^ BYTE4(x) ^ \
                        BYTE5(x) ^ BYTE6(x) ^ BYTE7(x) ^ BYTE8(x)
```

Calculate HASH(300).

Is this a good hash function?