

COEN 11 - Winter 2009 - Practice VIII

Solutions on Wednesday

1. Create the following macros:
 - a. `IS_DIGIT(X)`
 - b. `IS_UPPER(X)`
 - c. `IS_EVEN(X)`
 - d. `AVERAGE(X,Y,Z)`
2. Convert an unsigned short integer into its corresponding string of bits without using bitwise operations.
3. Use bitwise operations to:
 - a. assign to char variable a the value of the right-most bit of variable b.
 - b. assign to char variable a the value of the 4th right-most bit of variable b.
 - c. assign char variable b to char variable a, so that the 4 right-most bits of b become the left-most bits of variable a, and the 4 left-most bits of variable b become the 4 right-most bits of variable a.
 - d. change char variable a, so that the 4th right-most bits become 0.
 - e. change char variable a, so that the 4th left-most bits become 1.
 - f. rotate the bits in variable x by 2, in the left direction.
 - g. rotate the bits in variable x by 2 in the right direction.
 - h. distribute the bits in a byte (unsigned char x) into an 8-entry array of integers, so that `array[0]` receives the value of the right-most bit, `array[1]` receives the value of the 2nd right-most bit, and so on, until `array[7]` receives the value of the left-most bit. (Use a for loop!)
4. Write a function to generate a fingerprint of a file by calculating the XOR of the entire file, using 128-bit words, i.e., each XOR operation is on 2 arrays of 128 bits (16 bytes).