

COEN 11 - Practice IX

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. 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.

3. How can you avoid a loop in the following scenarios?
 - a. Inserting data in an open slot of an array in which the data ordering is not important.
 - b. Deleting an element from an array in which the data ordering is not important.
 - c. Inserting or deleting the last node of a doubly-linked list.

4. Give one advantage and one disadvantage for the following implementations and explain how it could be done better.
 - a. Using an array to implement a phone book ordered by name.
 - b. Using a linked list to implement a phone book ordered by name.
 - c. Using an array to implement a first-come-first-served restaurant waiting list.
 - d. Using a linked list to implement a first-come-first-served restaurant waiting list.