

## **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.