# Introduction to Computer Technology

## Assignment 3: Logic Gates

**Due date: Thu. 5 Oct. 2017**

1. In order to say that 3 is larger than 2, a mathematician writes "3>2". If she wants to say that 7 is smaller than 9 she writes "7<9", but she could as well write "9>7". That is, something like "34<78" can be read as 34 is smaller than 78 or as 78 is larger than 34. Say if the following sentences are true or false.

   a) 3>2
   b) 7<4
   c) 2>1 AND 6<9
   d) 2>1 AND 9<9
   e) 2>1 OR 9<9
   f) 2>3 OR 9<9
   g) 2>3 OR ( NOT (9<9) )
   h) (NOT (2>3) ) OR 9<6

2. The mathematician also often likes to express things like 2 is smaller or equal than 3 and she writes for that "2<=3", or she wants to say 120 is larger or equal than 7 and for that she writes "120>=7". Say if the following sentences are true or false.

   a) (3>2) OR (2>=2)
   b) (3>2) OR (NOT (2>=2) )
   c) (3<=2) OR (7>=2)
   d) NOT ( (3<=2) OR (7>=2) )
   e) NOT ( (3 > 0) OR (3 > 10) )
   f) NOT ( (3 <= 0) OR (3 >= 10) )

3. Write the truth table of the following logic expression. Assume that x and y stand for values of the input and z is the final output

   a) x OR (NOT y)
   b) NOT ( x AND y )
   c) (NOT x) OR (NOT y)
   d) NOT ( x OR y )
   e) (NOT x) AND (NOT y)