Practical Subjects – 17 January 2019

Work Time: 2 hours
Please implement in Java the following two problems.
If a problem implementation does not compile or does not run you will get 0 points for that problem (that means no default points)!!!

1. **(0.5p by default) Problem 1: Implement Relational expressions in ToyLanguage.**
   a. (2.75p). Define the new expression:
   MUL(exp1,exp2)
   Expression MUL(exp1,exp2) is evaluated to ((exp1*exp2)-(exp1+exp2)).
   For the expression evaluation you must ignore the precedence order of the operators. The order is given by the user when the expression is introduced.
   b. (1.75p). Show the step-by-step execution of the following program. At each step display the content of each program state (all the structures of the program state). The step-by-step execution must be displayed on the screen and also must be saved into a text readable log file.
   The following program must be hard coded in your implementation:
   v1=2;v2=3; (if (v1) then print(MUL(v1,v2)) else print (v1))
   The final Out should be {1}
2. **(0.5p by default) Problem 2: Implement Wait statement in Toy Language.**
   a. (2.75p). Define the new statement:
   wait(number)
   Its execution on the ExeStack is the following:
   - pop the statement
   - if number== 0 then do nothing
     else push (print(number);wait(number-1)) on the stack

   b. (1.75p). Show the step-by-step execution of the following program. At each step display the content of each program state (all the structures of the program state). The step-by-step execution must be displayed on the screen and also must be saved into a text readable log file.
   The following program must be hard coded in your implementation:
   v=20; wait(10);print(v*10)
   The final Out should be {20,10,9,8,7,6,5,4,3,2,1,200}