Decision Procedures and Verification

Seminar 7

1. (1 point) Consider the set of constraints :

$$x_1 \geq -x_2 + \frac{11}{5}$$
$$x_1 \leq x_2 + \frac{1}{2}$$
$$x_1 \geq 3x_2 - 3$$

   Using the Fourier-Motzkin procedure, compute the range within which x_2 has to lie in a satisfying assignment.

2. (1 point) Write down the boolean constraints for term $x + y$ where x, y are bit-vectors of width 3.

3. (1 point) Prove $a_{[l]} +_S b_{[l]} = a_{[l]} +_U b_{[l]}$.

4. (1 point) Write down the boolean constraints for terms $a \ll 5$ and $a \ll c$ where a is a bit vector of width 8 and c is a bit-vector of length 3.

5. (1 point) Suggest an encoding of comparison relation "$<$" that is based on lexicographic ordering.