CS-E4800 Artificial Intelligence
Assignment 2: Logic

Return the assignment as a PDF file **599854.pdf** (or a text file 599854.txt) with the following content, as well as your solution files **599854.fma** and **599854.smt**.

1. Name and student number clearly visible: Khandelwal Mayank, 599854

2. A brief description of your modeling

3. Full output from MathSAT with the **-model** option, but without the lines with *false*.

4. Your description of the solutions found by MathSAT.

Deadline: Thursday February 16 at 23:59

Unobservable increments and shifts

We have a system with 5-bit integers (expressed with state variables $ABCDE$) as states and two events that respectively multiply by 2 (shift left) and increment, as discussed in the lectures. Consider sequences of 6 events, generating a sequence of states $s_0, s_1, \ldots, s_6$, corresponding to time points $0, \ldots, 6$. Find out if the system can produce observations $A \wedge B \wedge \neg C \wedge D$ at time 6, E at time 5, $B \wedge C$ at time 4, C at time 2, and $\neg A \wedge \neg B \wedge \neg C$ at time 1. Do this by formalizing the 2 events in the propositional logic and testing, whether executions compatible with the observations are possible (i.e., the formula that encodes the observations and all possible event sequences is satisfiable.)