

Efficient Algorithms and Programming

Week 9

Reading before Monday October 29th

The BDD note section 7.

Exercises for Monday October 29th

The BDD note exercises 4.1–4.12

Programming assignment for Monday November 5th

Continue the implementation of the ROBDD Package (Section 8) by doing sub-project 2. Add the operation $\text{APPLY}(op, u_1, u_2)$ and two operations $\text{BUILDVAR}(i)$ and $\text{BUILDNVAR}(i)$ that returns the index of a vertex that represents the ROBDD for the variable x_i and the negation of the variable respectively. I.e., after performing $u \leftarrow \text{BUILDVAR}(i)$ then the function defined by u is x_i , $f^u = x_i$, and after performing $u \leftarrow \text{BUILDNVAR}(i)$ then $f^u = \neg x_i$.

In implementing $\text{APPLY}(op, u_1, u_2)$ you will need to implement the table G for memoizing earlier computed results. Use a dynamically growing hash table for this purpose.

Try out your implementation by redoing exercises 4.1 (use $\text{BUILDVAR}/\text{BUILDNVAR}$ to construct ROBDDs for the variables and APPLY for the operators), 4.4, 4.5. Give the result as the contents of the table after solving each of the exercises (using PRINT).

Reading for next week

CLR Chapter 36.1–2.