

## Lecture-13 Main Points

- The Algorithm
  - **Input:** A set of Horn clauses
  - Replace empty right-side in a clause by  $\perp$
  - Construct marking of variables  $\cup \{\perp, \top\}$  as follows.
  - Initially only  $\top$  is marked
  - Repeat the following till no new mark is created
    - \* If there is a rule with all premises marked but conclusion unmarked, mark the conclusion.
  - If  $\perp$  is marked output unsatisfiable else output satisfiable.
- Correctness
  - A variable or  $\{\perp, \top\}$  is marked only if *every* satisfying assignment for the input needs to assign it the value **true**.
  - When the algorithm outputs satisfiable then set of marked variables assigned **true** and remaining variables assigned **false** is a satisfying assignment of the input.
- Complexity
  - $O(n^2)$  implementation is straightforward.
- Example run of algorithm.

## References

- [1] Huth and Ryan Book, pages 65-68.