



UNIT 8. Computational Complexity

The Computational Complexity Theory is a branch of the Theory of Computation in Theoretical Computer Science and mathematics that focuses on classifying computational problems according to their inherent difficulty, and relating those classes to each other. A computational problem is understood as task that is in principle amenable to being solved by a computer, which is equivalent to stating that the problem may be solved by mechanical application of mathematical steps, such as an algorithm. A problem is regarded as inherently difficult if its solution requires significant resources, whatever the algorithm used. The theory formalizes this intuition, by introducing mathematical models of computation to study these problems and quantifying the amount of resources needed to solve them, such as time and storage. We finish this course studying one of the main roles of the Computational Complexity Theory, which is focused on determining the practical limits on what computers can and cannot do.

The main objectives of Unit 8 are:

- To introduce the main objectives of the Theory of Computation and the Computational Complexity Theory.
- To know what is a Non-Deterministic Turing Machine.
- To classify problems according to the different theories introduced in the unit.

