

# Theory of Computation

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## 1 Why TOC?

- It helps us to understand the limits of what computer can do and how to model computation using mathematics

**Q1:** What is the motivation for studying theory behind computation? OR Needs of TOC?

**A:**

- Understanding the capability of a computer
- To find steps to solve a problem
- Increase efficiency while doing a task

**Q2:** List the problems that cannot be solved by a computer.

**A:**

1. Ethical problems. Eg: Self-driving car deciding to save the driver/passenger or the pedestrian

## 2 Automaton (pl.: Automata)

A simplified mathematical model of a machine (digital computer) - It accepts input, produces output, may have some temporary storage and can make decisions in transforming the input into the output