Preliminaries

And

Introduction

What should you already know? Discrete maths (COL202)

* Sets: Membership, equality, set operations, properties, inductive definitions, subset, power sets, Cartesian products
* Relations: Composition, properties, closures
* Functions: Total/partial functions, in-/sur-/bi-jections, composition
* Cardinality: Finite vs infinite sets, countable vs uncountable, diagonalization
* **Proof techniques**: Induction (mathematical/structural) especially!

What is this course about?

Introduction to Automata and Theory of Computation

Why do we need a theory of computation?

To know what is computable, and what is not

If something is computable,

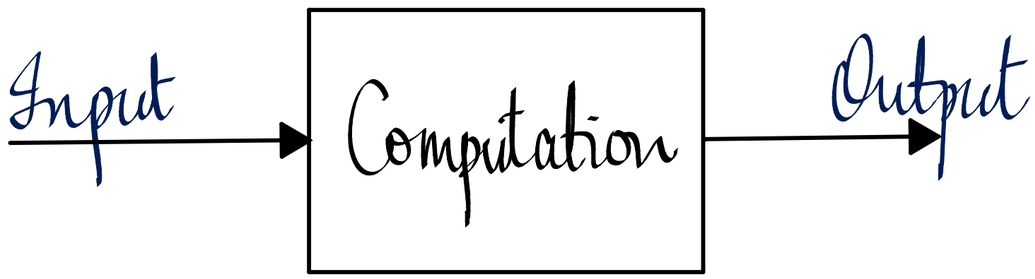
→ How much computing machinery does it require?

→ How efficiently can it be computed?

So how do we figure out whether something is computable?

What counts as a computation?

Need some uniform way to talk about computation.



We can describe a computation as a set of pairs of the form

(Input, Output) — Skip if none / trivial

Such a set is called a language