* 01/10/2024
  + Historical introduction. From logics to computability to modern computer science.
* 07/10/2024
  + Effective procedures and computable functions. Relations, functions, sets and cardinality. Existence of non-computable functions.
* 08/10/2020
  + URM-computability. The class C of URM-computable functions. Examples. [§1.2, §1.3]
* 14/10/2024
  + Exercises on some variants of the URM machine
  + Decidable predicates. [§1.4]
  + Computability on domains different from the natural numbers. [§1.5, §3.6]
* 15/10/2024
  + Generating computable functions: Notation. Closure under generalized composition (Substitution) [§2.1, §2.2, §2.3]
  + Primitive recursion and examples [§2.4]

Actual lesson

* **Existence of non-computable function**

Definition of partial function and meaning of functions (pag. 40 of my notes)

Meaning of diagonalization and meaning with examples

(Exercises of diagonalization)

* **URM machine**

It has different instructions:

* *zero* , which sets the content of register to zero:
* *successor* , which increments by 1 the content of register :
* *transfer* , which transfers the content of register into , which staying untouched:
* *conditional jump*: , which compares the content of register and , so:
  + if then jumps to (jumps to -th instruction)
  + otherwise, it will continue with the next instruction

**Immagine che contiene testo, schermata, Carattere, linea

Descrizione generata automaticamente**(Exercises of URM machines)

(Esercizi da esami in italiano qui)

* **Decidable predicates**

In mathematics, we often want to express *properties*. Consider as mathematical property the *divisor*:

Immagine che contiene testo, Carattere, bianco, calligrafia

Descrizione generata automaticamenteAs computer scientists, we can also see the divisor as a function:

In the context of computability and formal logic, we introduce the concept of a predicate, which is a statement or function that takes one or more inputs and evaluates to either *true* or *false*, typically based on some condition or relationship.

* **Generation of computable functions**
* **Primitive recursion**

Definition

Some exercises