LESSON ONE: WHAT IS COMPUTER SCIENCE?

What is computer science?

Computer science: the study of information, protocols and algorithms for idealized and real automata.

- **Automaton:** "self-moving" in our context, "self-deciding" or autonomous mechanism with bounded resources (time and space).
- **Information**: knowledge represented in a form suitable for transmission, manipulation …etc.
- **Protocols**: rules for exchanging information without problems.
- **Algorithms:** an unambiguous, finite description in simple steps or actions.

Computer science is not the study of computers, nor is it the practice of their use.

Mathematics, science, or engineering?

- **Mathematics:** the science of numbers, interrelations, and abstractions.
- **Science**: systematic knowledge or practice. Acquiring knowledge through the scientific method of natural phenomena (natural sciences) or human or social behavior (social sciences).
- **Engineering:** the applied sciences of acquiring and applying knowledge to design, or construct works for practical purposes.

What does a computer scientist do?

Similar to mathematics, most everyone in modern society uses computing, so getting a computer science degree prepares you for everything and nothing.

The most visible activity is commanding computers to do our bidding i.e. programming.

What do you want to do?

Fields:

- Computer architecture.
- Operating system.
- Programming languages and compilers
- Algorithms, data structures, complexity.
- Computability theory.
- Numerical analysis.

- Networking and distributed computing.
- Parallel computing.
- Information management/ database systems.
- Software development
- Human-computer communication/interaction.
- Graphics and visual computing.
- Intelligent systems.