

Lectuer 1. Introduction to Discrete Mathematics

Target Audience

- students who are preparing for GATE and other competitive exams
- students who want to learn competitive programming
- college going students who have Discrete Mathematics in their syllabus
- if you want, you can try

Why Study Discrete Mathematics?

- It develops your mathematical thinking
- Improves your problem solving ability
- It's important for the computer science students to learn Discrete Mathematics
- Many problems can be solved using Discrete Mathematics

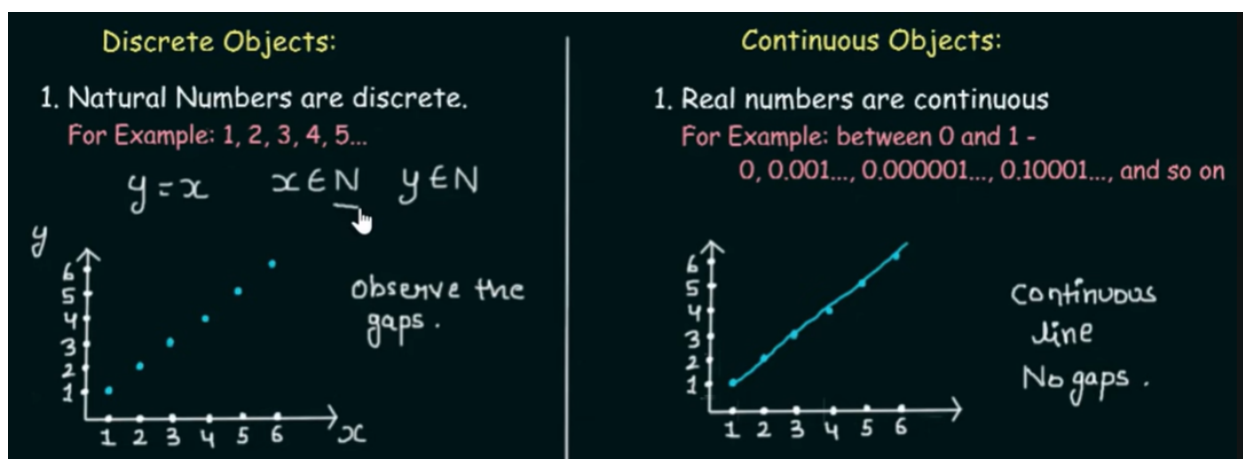
What is Discrete Mathematics?

Discrete Mathematics is the study of discrete objects.

Discrete means: "distinct or not connected (不同或不相关)"

It's not a branch of Mathematics. It is rather a description of set of branches that have one common property - that they are "discrete" and not "continuous"

Discrete vs Continuous



2. Digital clock is "discrete" in nature.

- there is no continuous time,
- Transition from one time to another is sharp.

10:42:57 → 10:42:58
↓
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2. Analog clock is continuous in nature.

- In Analog clock - hour, minute and second hands move smoothly over time.

Consider the clock where minute hand, hour hand and second hand sweeps around the time smoothly



Syllabus

1. Propositional Logic and First Order Logic (命题逻辑和一阶逻辑)
2. Set theory (集合论)
3. Relations (关系)
4. Functions (函数)
5. Partial Orders and Lattices (偏序和格)
6. Combinatorics (组合学)
7. Graph Theory (图论)
8. Group Theory (群论)