

COL 352
Introduction to Automata [&] Theory of
Computation

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428

Course page www.cse.iitd.ac.in/~ssen

→ COL352

M, W, Thu Office hrs 12-1
11-12 11-12 12-1

→ Hopcroft and Ullman + Motwani (new edn)

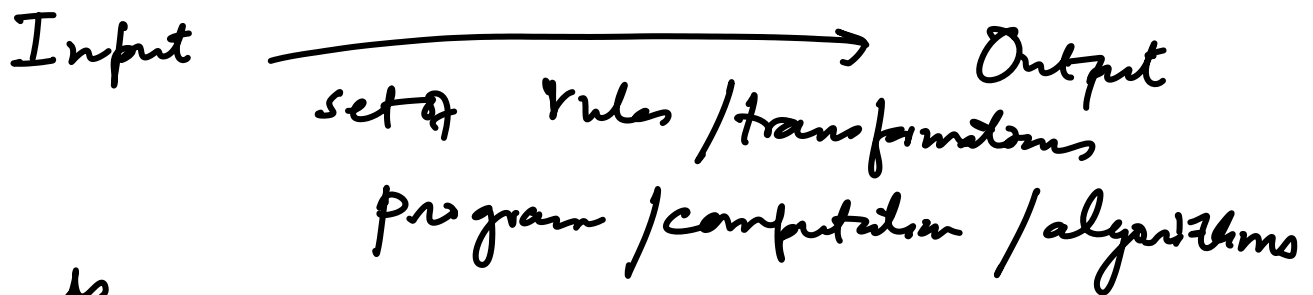
2 minors ~ 20% each

Major ~ 40%

Take home assignment + 3 quizzes : 20%

Prereqs : → Data Str & Algo
 → Discrete Structure

Computation / Algorithms



all operands
are integers
(i)

finite set of rules

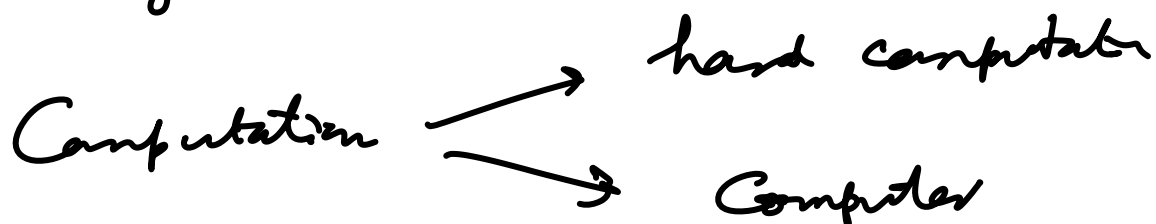
program is of finite length

(ii) Computation should terminate

(iii) Output should correspond according to some specification

Efficiency is important but not central to the notion of computation

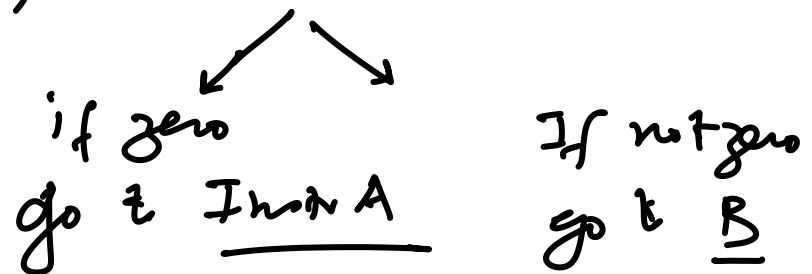
Algorithm / Computation



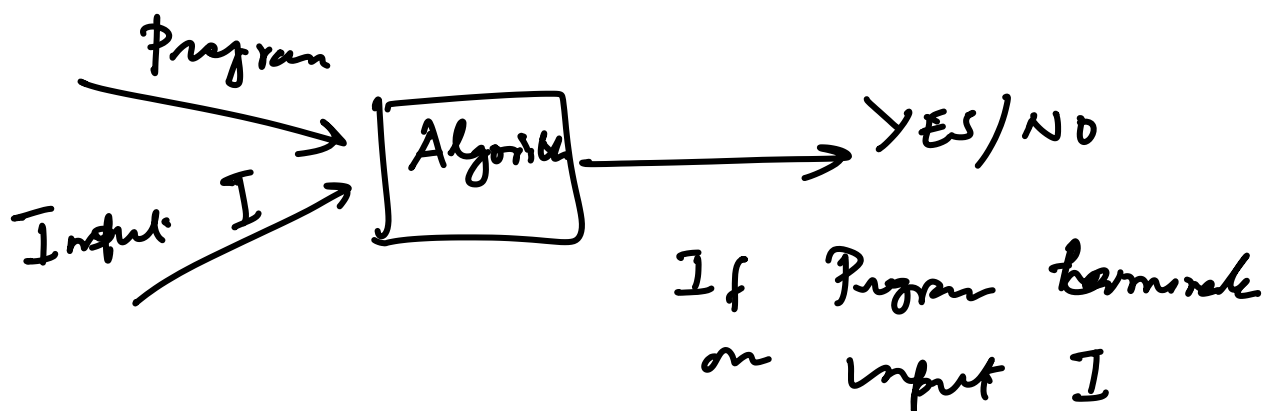
1. What kind of rules / instructions?
2. What kind of computing machinery?

Minimum set of instructions that can be considered "universal"

- (i) Increment , (ii) Conditional decrement



For any problem we can write a program?



	X w_i	B x_i
1	1	111
2	10111	10
3	10	0

Question: Is there a sequence of integers $i_1, i_2, i_3, i_4, \dots, i_m$

$$i_j \in \{1, 2, 3\}$$

s.t. $w_{i_1} = w_{i_2} \cdot w_{i_3} \cdot \dots \cdot w_{i_m}$

$$? = x_{i_1} x_{i_2} x_{i_3} \dots x_{i_m}$$

YES / NO

$$w_2 \cdot w_1 \cdot w_1 \cdot w_3 = 10111 \cdot 1 \cdot 1 \cdot 10$$

$$x_2 \cdot x_1 \cdot x_1 \cdot x_3 = 10111 \cdot 11 \cdot 0$$

	A	B
	10	101
	011	11
	101	011

