Logic and Algorithms – Recitation 5

Logic
Basic logic symbols: **logical AND** (Λ)**, OR** (V)**, NOT (~ or ¬).**

What is a **proposition**? A sentence that is either true or false.
Example: 'It is sunny outside' is a proposition. 'What time is it?' is not a proposition.

Symbols to sentences: Let p and q be propositions – p: it is raining outside; q: it is snowing outside. Express the following as English sentences:
p Λ q: It is raining outside and it is snowing outside.
p→ q: If it is raining outside, then it is snowing outside.
(p Λ ~q) V ~p: It is raining and not snowing outside, or it is not raining.
~p→ q: If it is not raining outside, then it is snowing outside.

Sentences to symbols: Let r and s be the propositions – r: you are crying; s: you are laughing. Express the following as logical statements:
You are not laughing: ~s
If you are crying then you are not laughing: r → ~s
You are not crying and you are not laughing: ~r Λ ~s
You are crying or you are laughing: r V s
If you are not laughing then you are crying: ~s → r

Algorithms (flowcharts):

Symbol	Name	Function
	Start/end	An oval represents a start or end point.
	Arrows	A line is a connector that shows relationships between the representative shapes.
	Input/Output	A parallelogram represents input or ouptut.
	Process	A rectangle represents a process.
	Decision	A diamond indicates a decision.

Example of application:
-Start the process of billing
-Order 2 burgers, 3 pizzas (input)
-Calculate the prices (process)
-If cost > $10 give free coupon (decision box with yes); if cost < $10 do nothing (decision box with no)
-Display the cost (output)
-End the process