

## Characteristics of Algorithms :

Algorithms have five essential characteristics that make them precise, executable procedures similar to function or lab experiments.

### Input

- Algorithms take zero or more inputs.
  - Some may not require input, but most process some data.
  - Example : A C function may take no parameters but still process something.
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### Output

- Must produce at least one output or result.
  - Useless without generating something meaningful.
  - Algorithm must generate result... function does something definitely.
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### Definiteness

- Every statement must be unambiguous with a single, exact meaning.
- Clear enough for humans and thus computers to understand and execute.

Key Rule :

- No vague or unsolvable instructions.
  - Avoid undefined values.
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### Finiteness

- Must have a finite number of steps and terminate after execution.
- Limited statements (10 - 10,000) — must stop.

Contrast :

- Algorithms : Stop and return result like functions.

- Not Algorithms : Continuous servers like database, web servers that run indefinitely unless stopped.

## Effectiveness

- Every step must be effective — do something purposeful.
- No unnecessary or irrelevant statements.

