

# Research on Data Semantics

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What is data semantics?

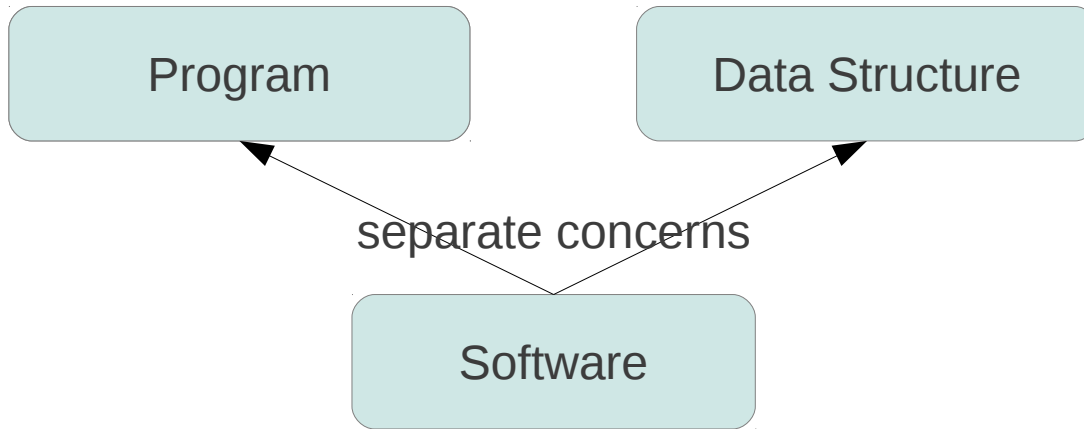
# What is data semantics?

To answer this we will look at software semantics in general.

# What is data semantics?

Software

# What is data semantics?



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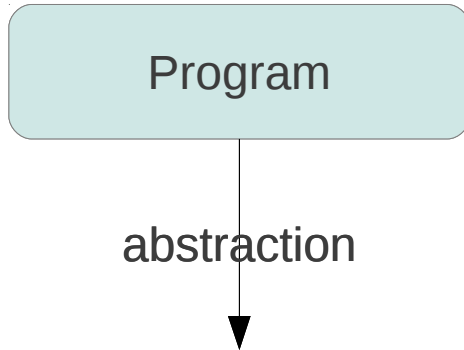
Program

Data Structure

# What is data semantics?

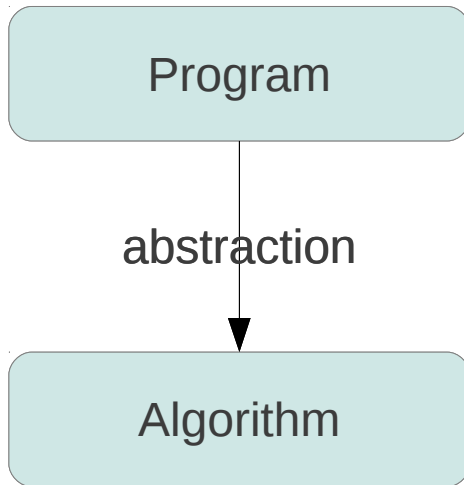
Program

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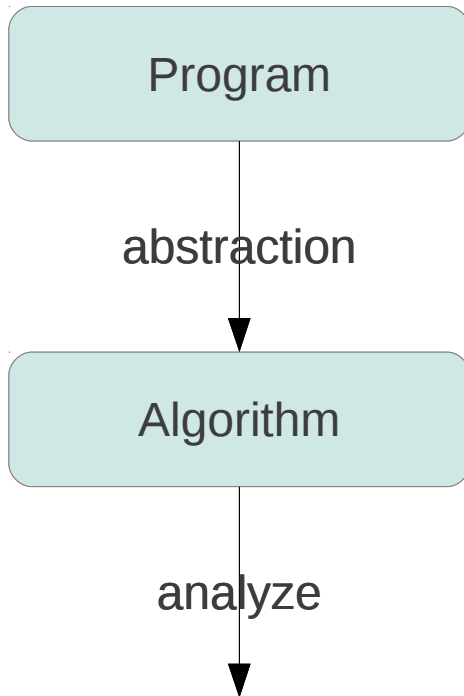




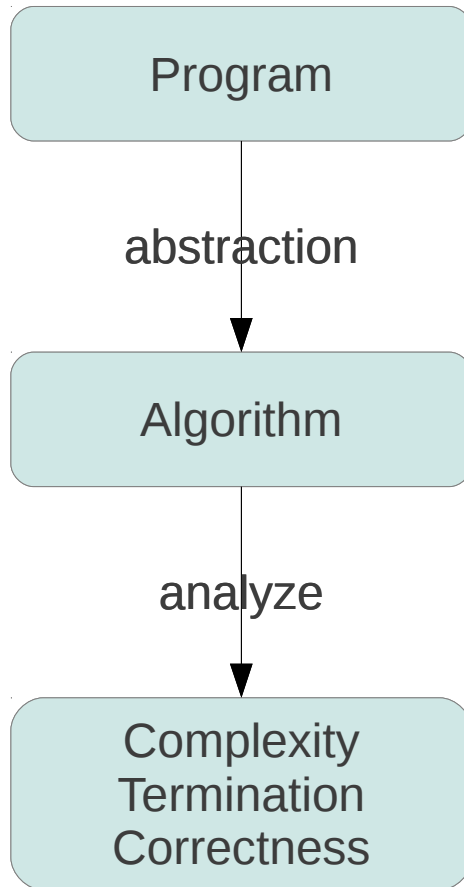
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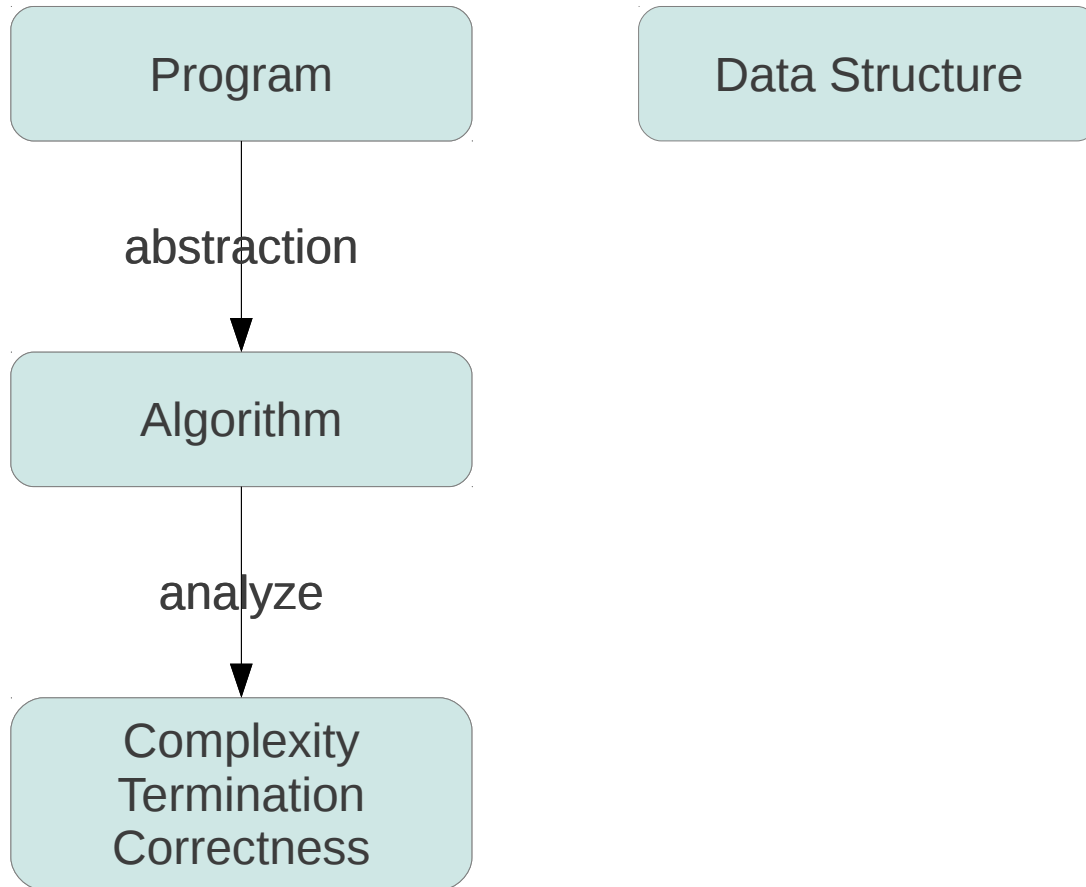
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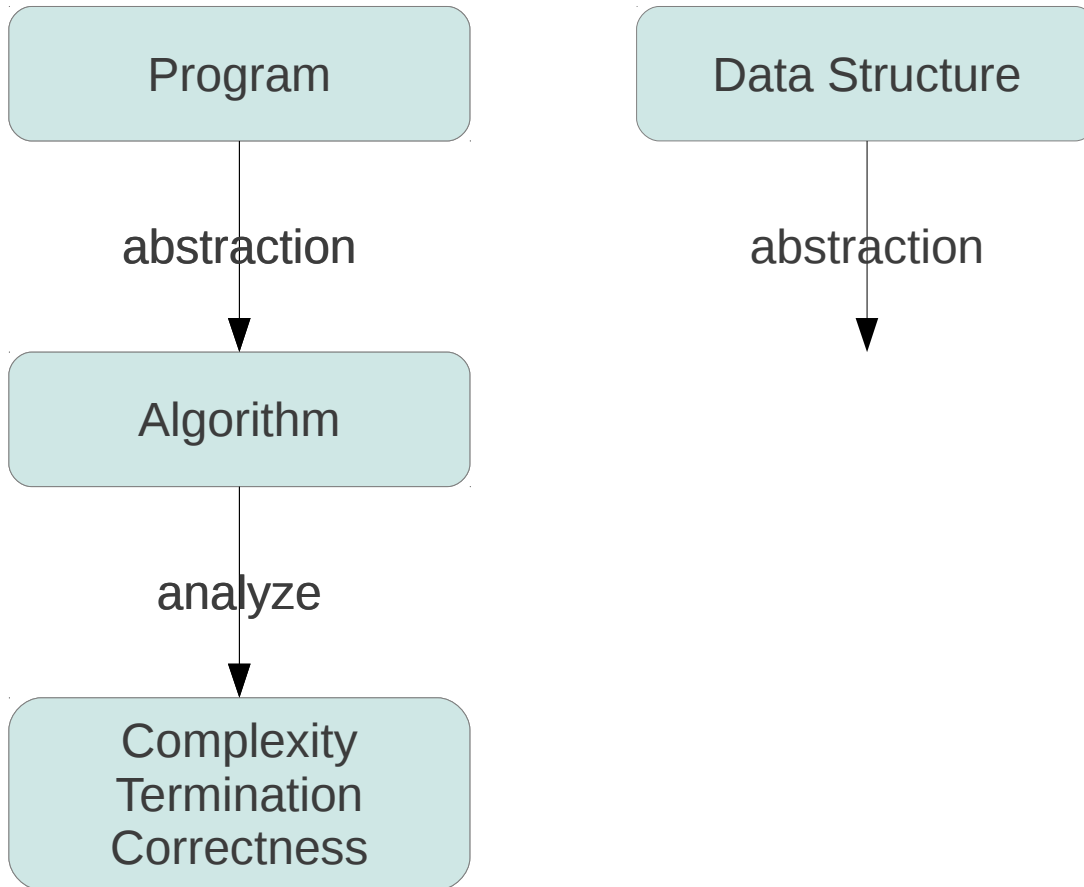
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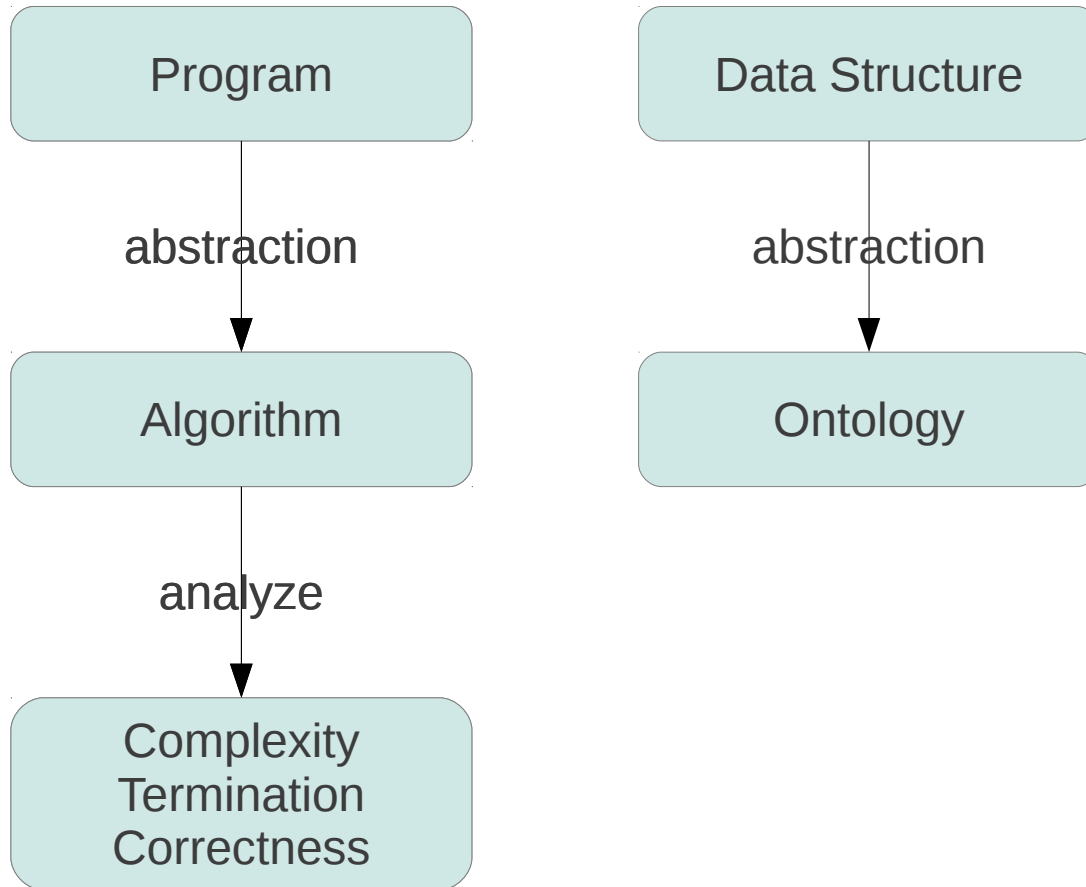
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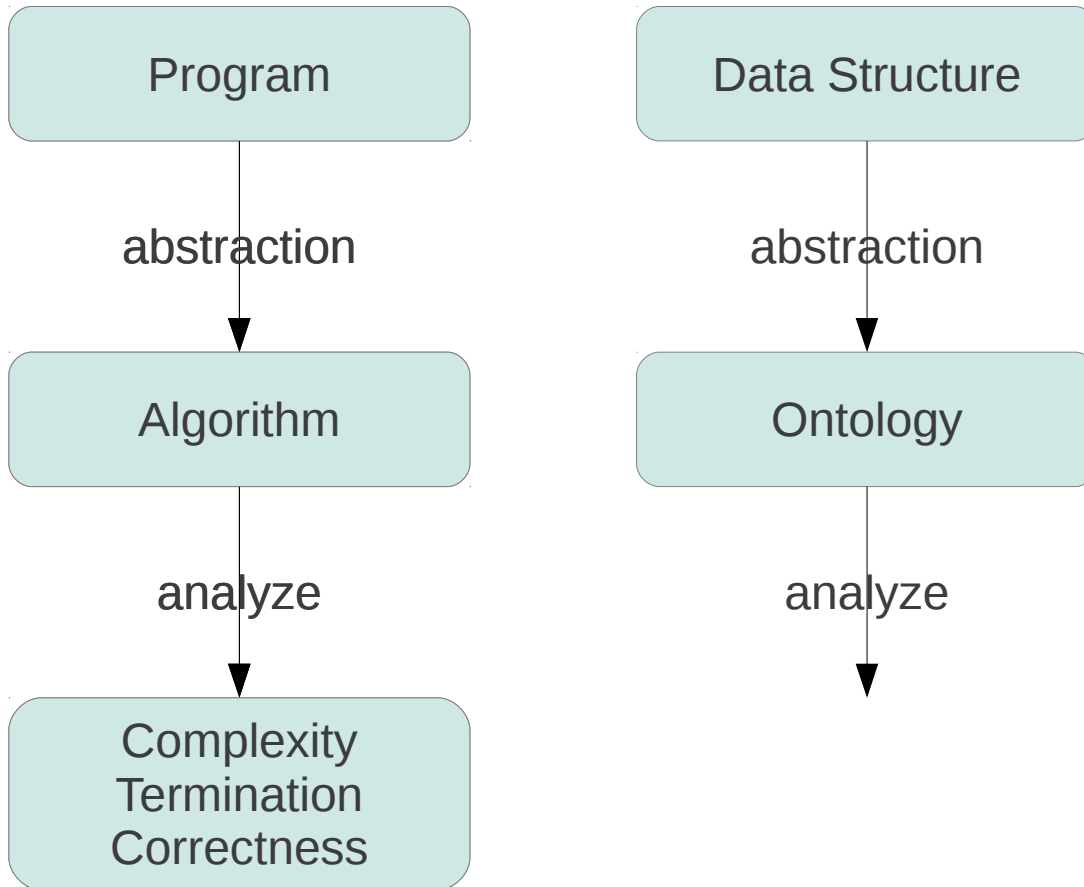
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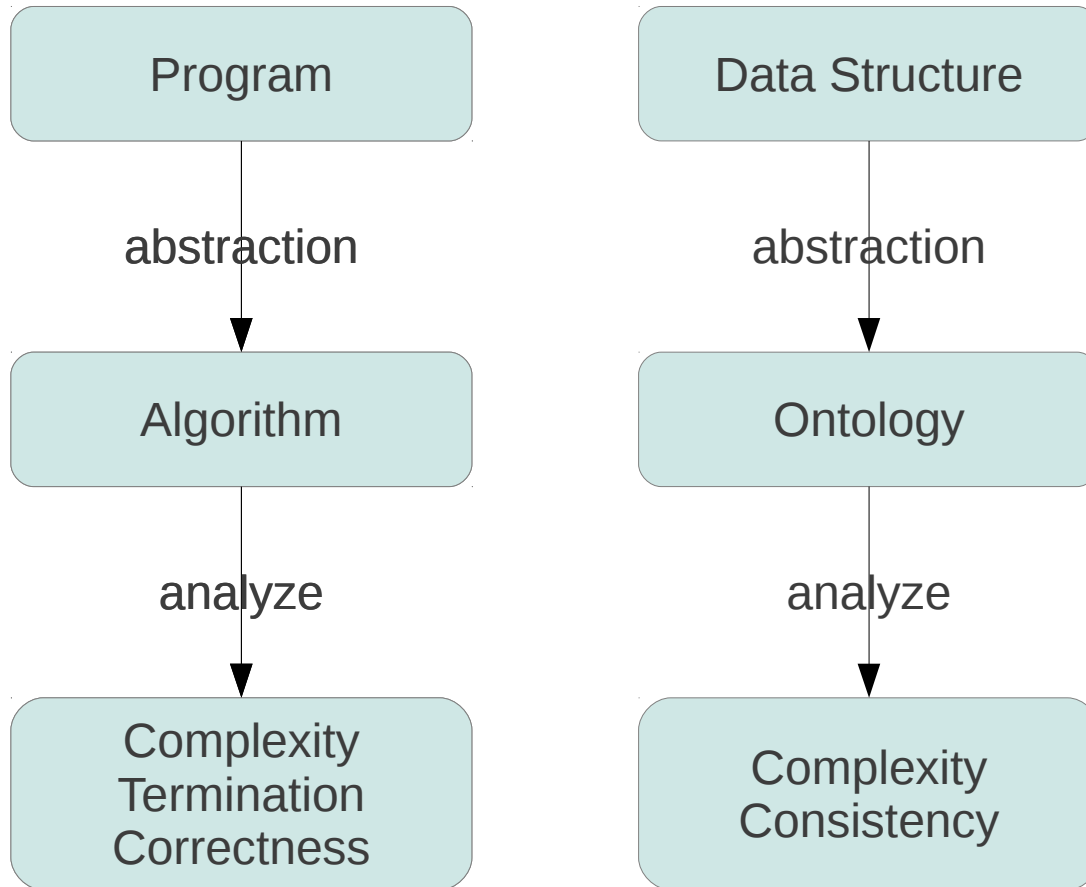
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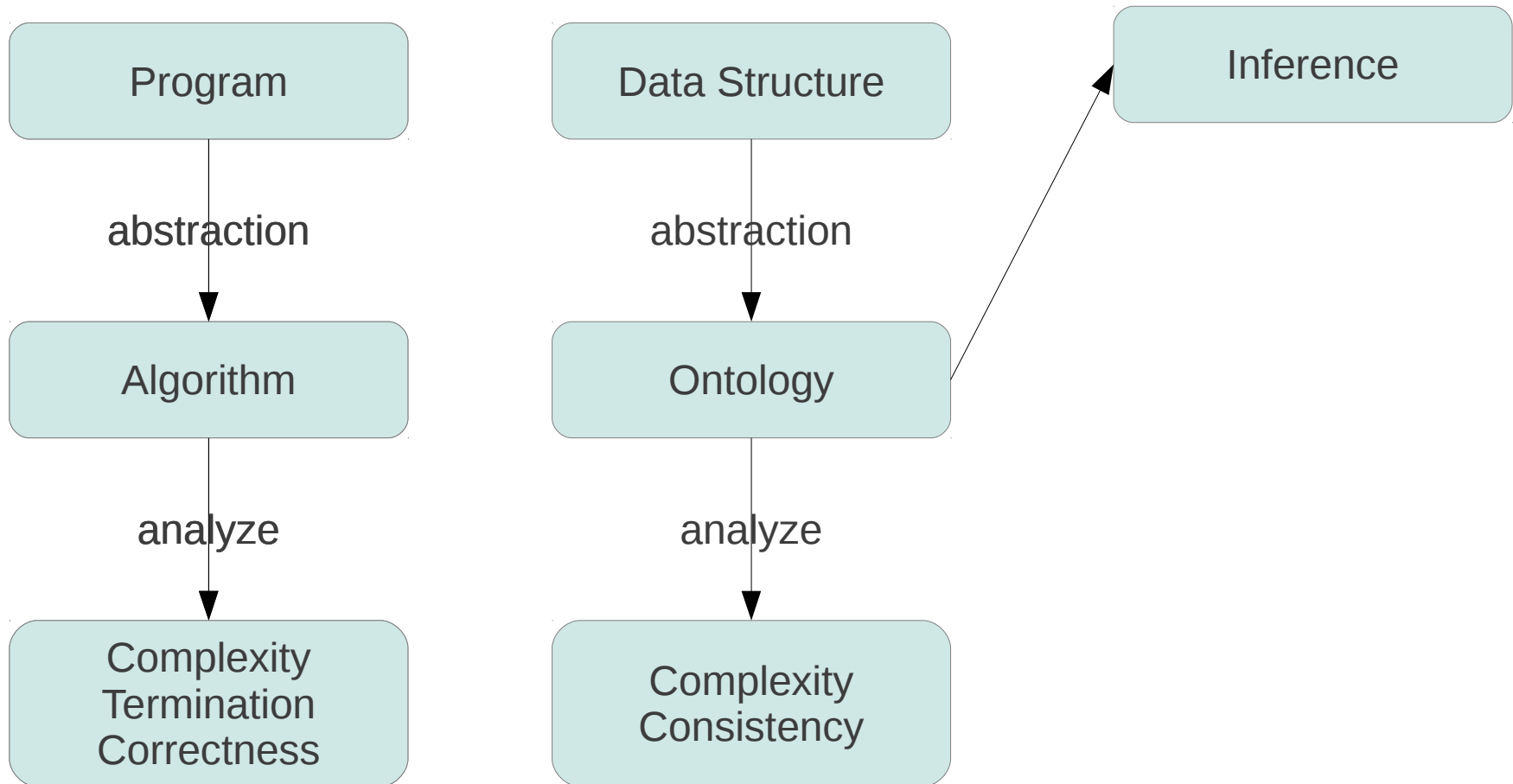


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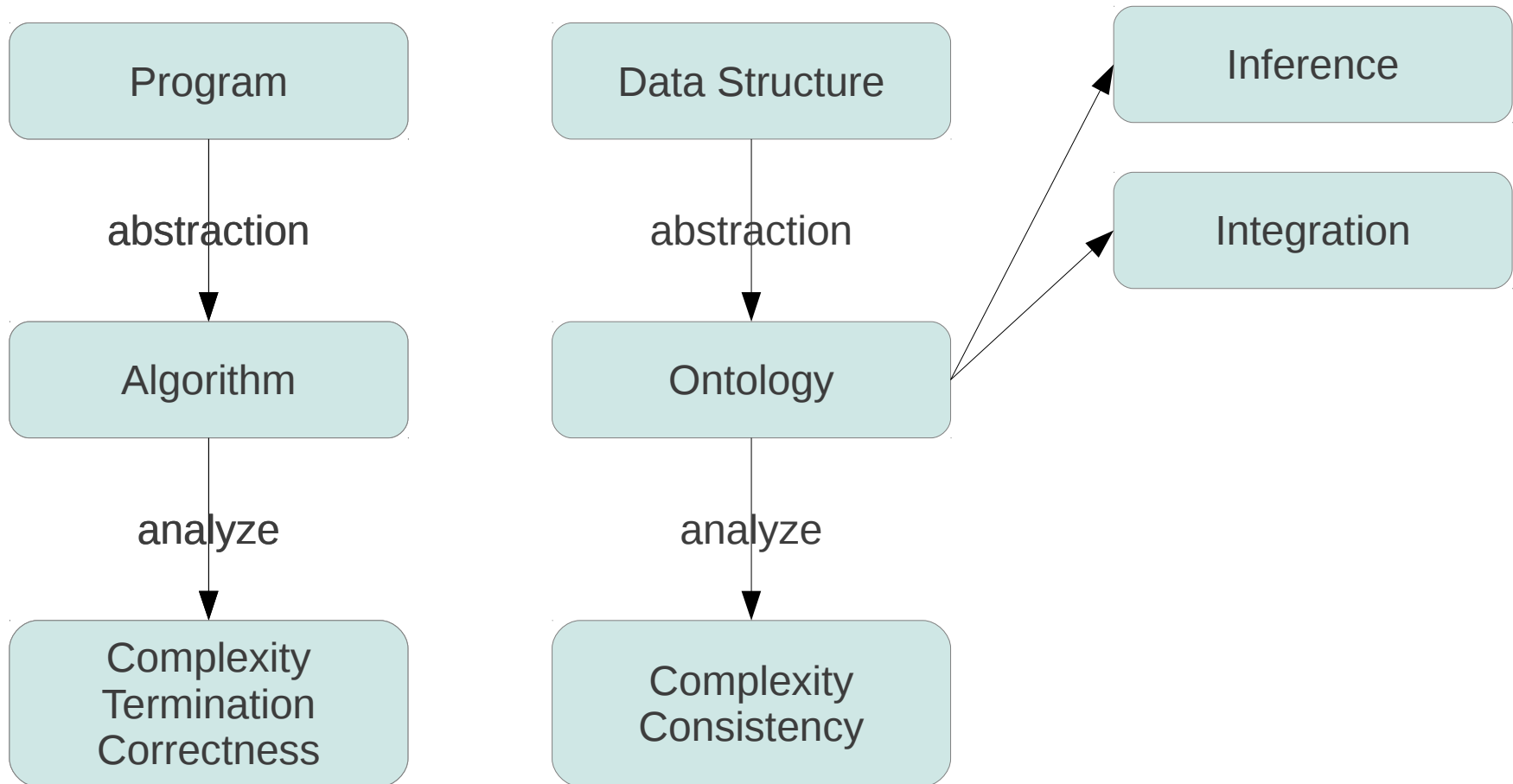




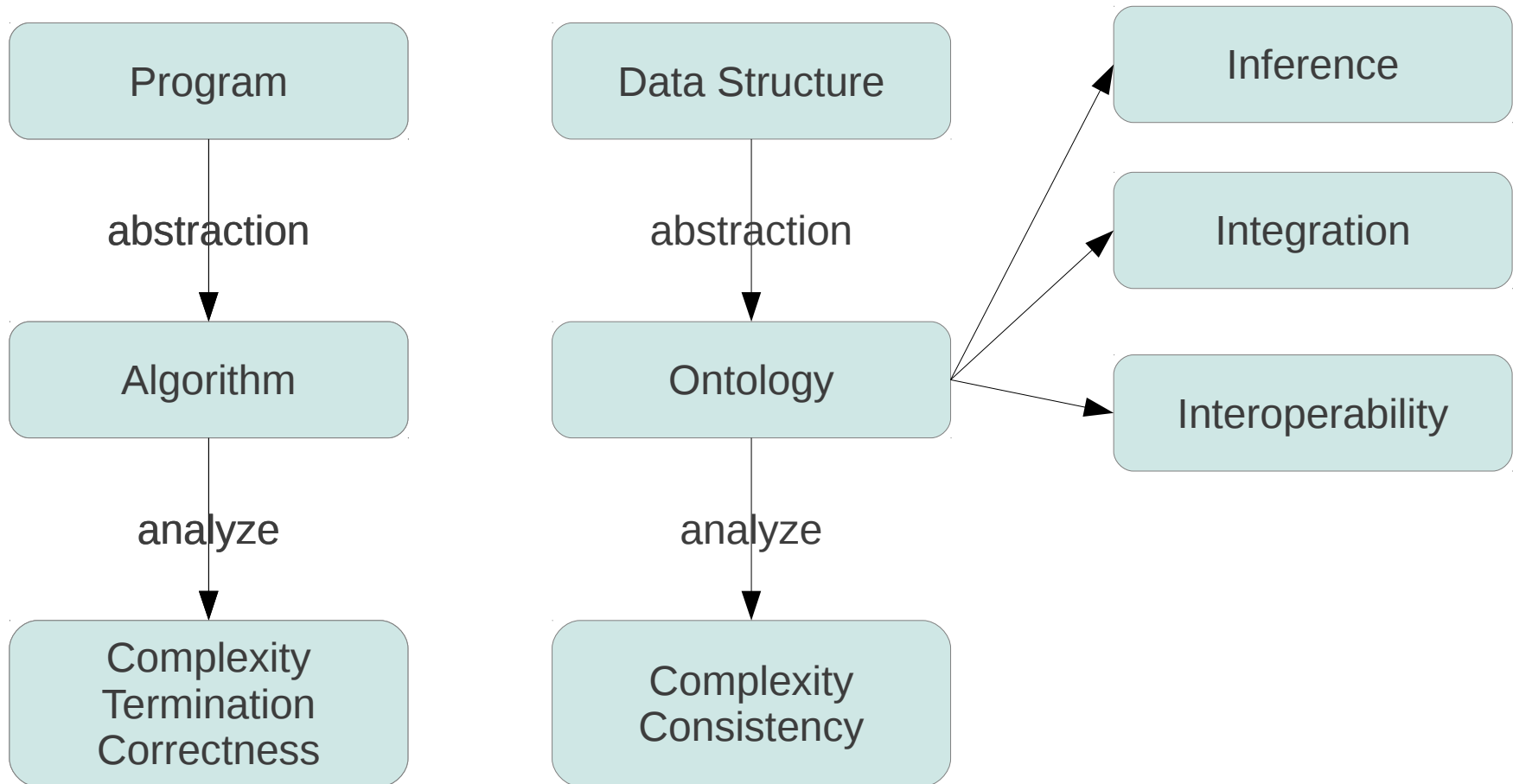
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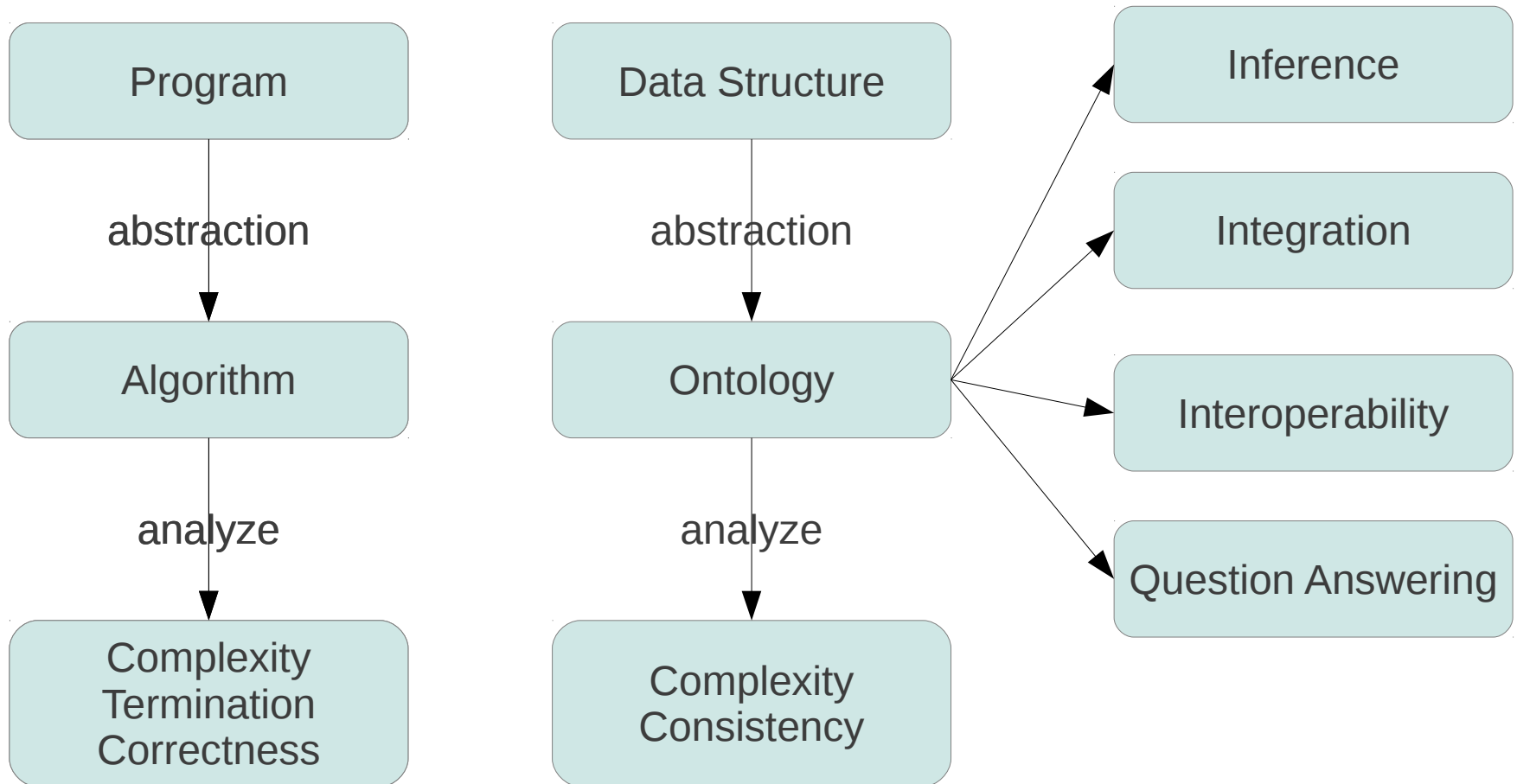
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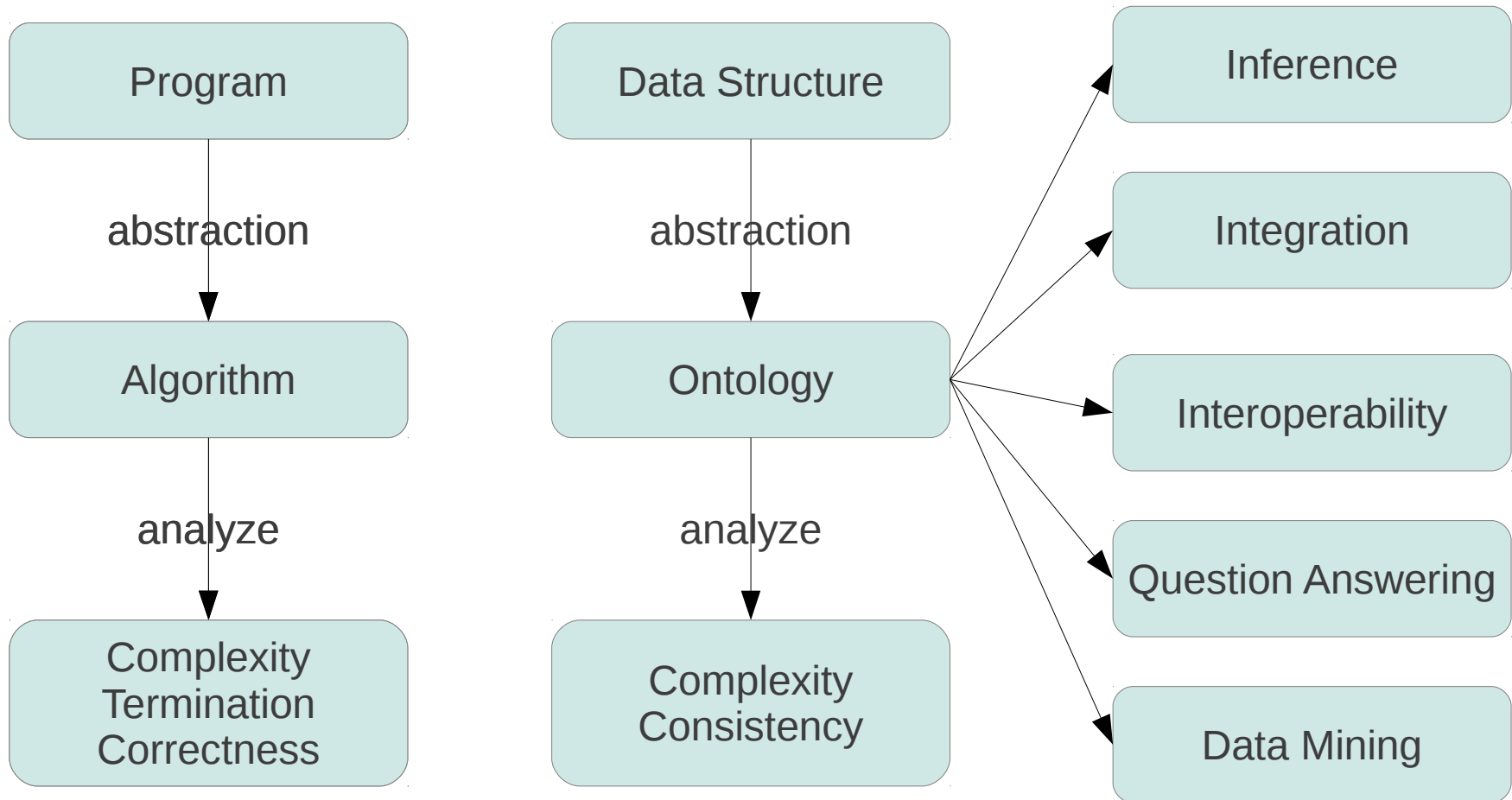
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# Application Domains

- Health Sciences
- Collaboration tools
- Social networking
- Web services
- Standards: OASIS, W3C, OMG, ISO, ...
- eGovernment
- Knowledge capture
- Software engineering
  - Versioning
  - Modularization
  - Formalization
  - Repositories
  - Higher-order logic
- Wireless communication
- Situation awareness

# Open Data Standard

# Background

- Vast amount of available data
  - Databases (usually, but not always, relational)
  - Scientific data streams (such as Big Data)
  - Internet (such as websites)
- Large number of formats
  - Often unique to a database, stream or site
- Complex formats
- Underspecified semantics
  - Implicitly specified by programs, or
  - Databases specified with SQL
- Difficult to access and to integrate
  - Often accessible only through applications such as browsers



# Open Data Protocol (OData)

- Web protocol for data access
  - Support for CRUD operations
- Built on existing standards
  - HTTP protocol
  - RESTful web services and principles
  - ATOM/XML and JSON formats
- Open standard
  - OASIS Technical Committee
  - Open license
  - Open source libraries

# History of OData

- Microsoft Role
  - Original developer of OData
  - Development process was open (Microsoft Open Specification Promise).
  - Donated to OASIS
- Founding organizations of OASIS TC include:
  - SAP AG, IBM, Citrix
  - Progress Software, WSO2
  - Northeastern University
- OData is not a Microsoft product!

# Momentum

- OData is already in use
  - Major websites: Netflix, eBay
  - Open government initiative
  - Commonly used for accessing internal data sources within large companies
  - See [odata.org](http://odata.org) for more examples.
- Not just a proposed standard
  - Already up to the third version
  - Based on extensive commercial experience
  - Both proprietary and open source software