

ADAM V. BE / IP

INFORMATION

PROGRAMMING

INTRODU

WHAT CAN IT DO

PROBLEMS

RECOGNITION

COMPLETION

CHECKING

CALCULATION

CTION

WHAT CAN IT DO

PROBLEMS

RECOGNITION

COMPLETION

CHECKING

CALCULATION

INCREASING
INFORMATION

CTION

WHAT CAN IT DO

PROBLEMS

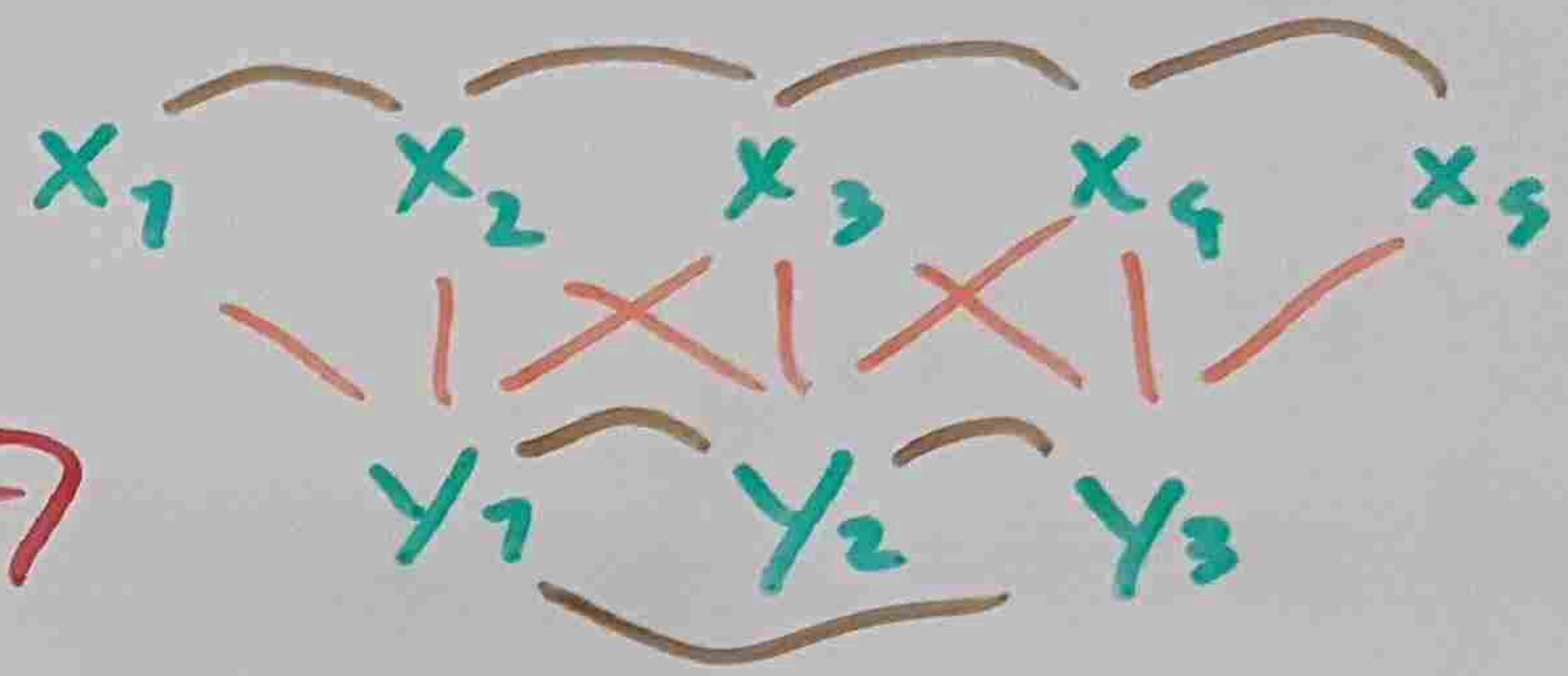
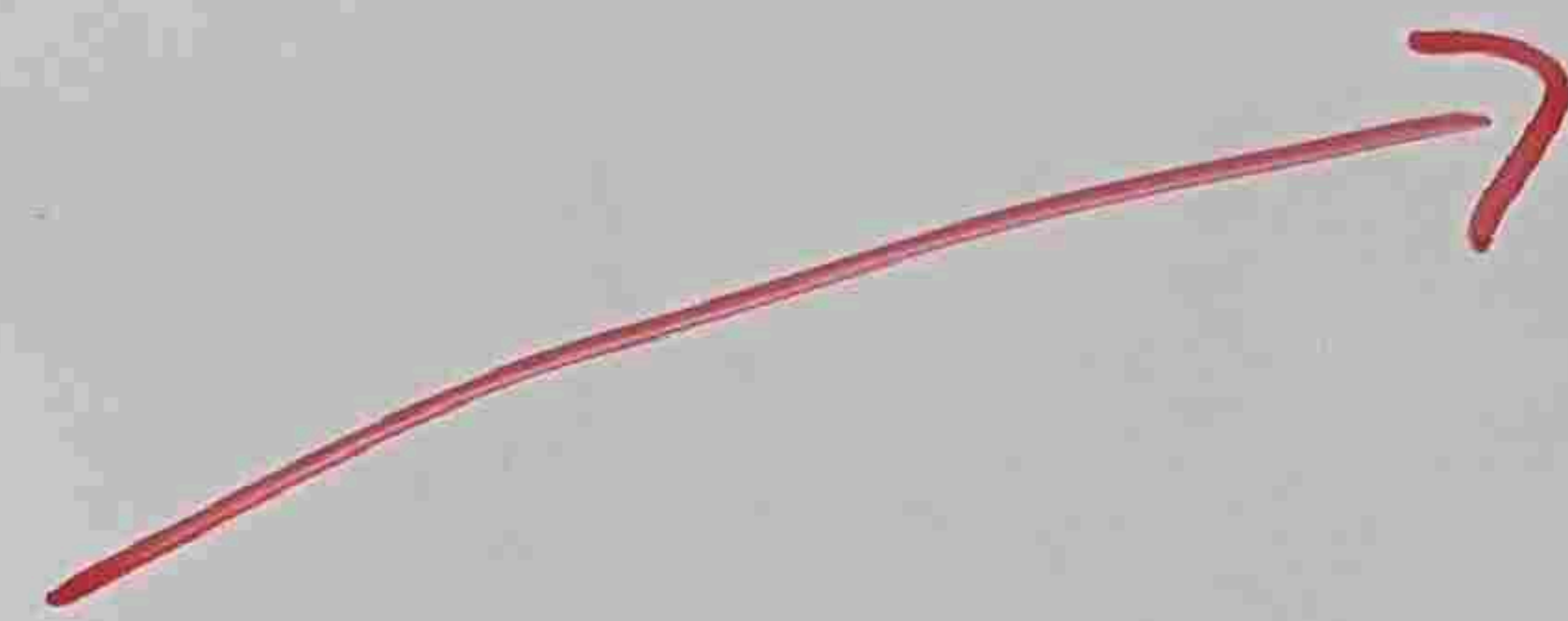
RECOGNITION

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INFORMATION



WHAT CAN IT DO

PROBLEMS

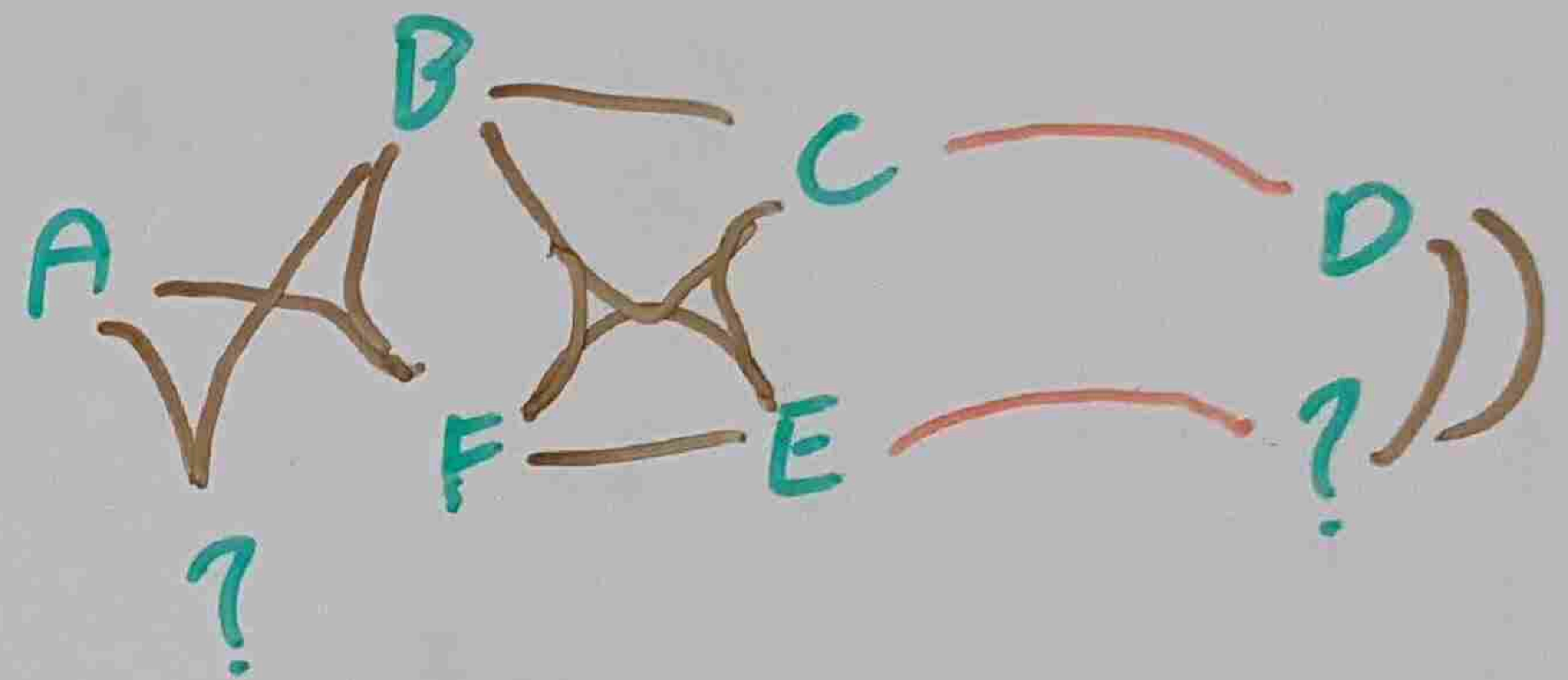
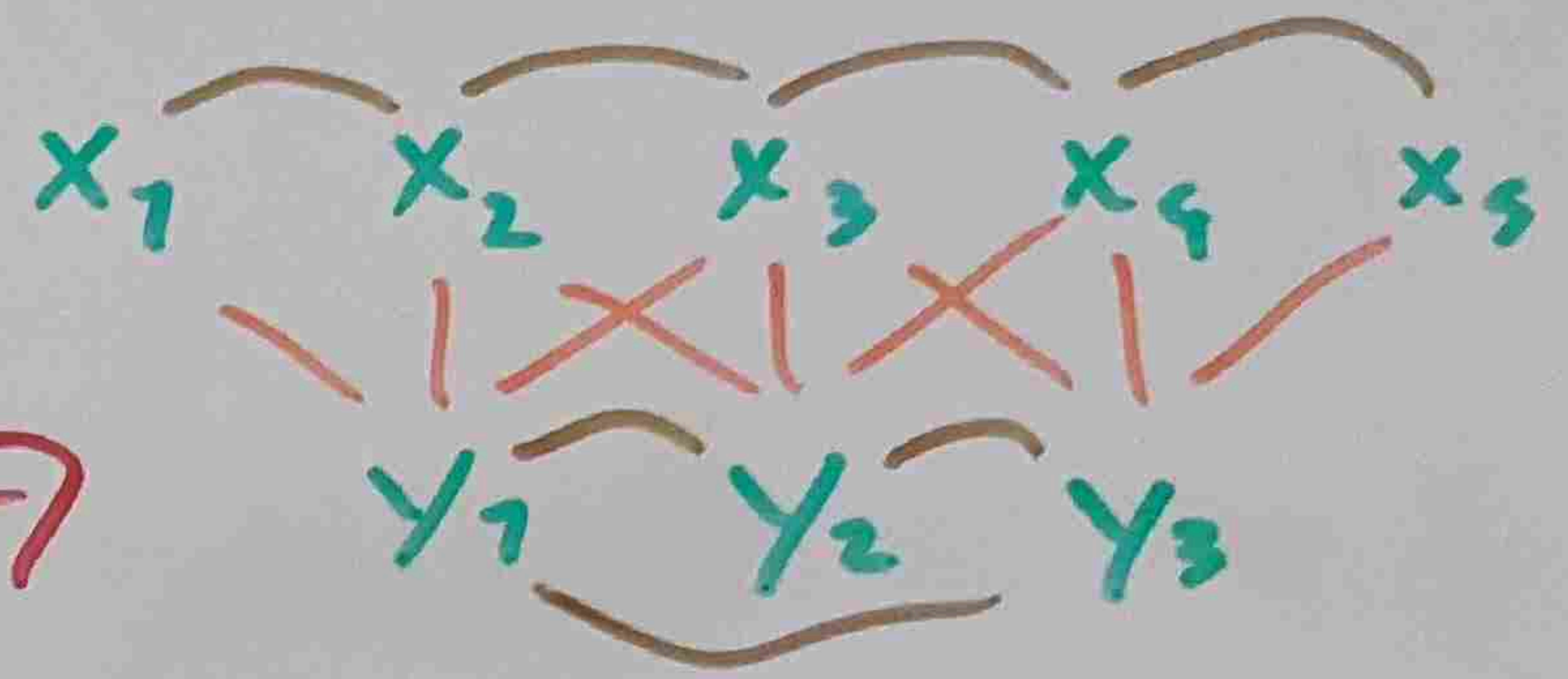
RECOGNITION

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INFORMATION



CTION

WHAT CAN IT DO

INCREASING
INFORMATION

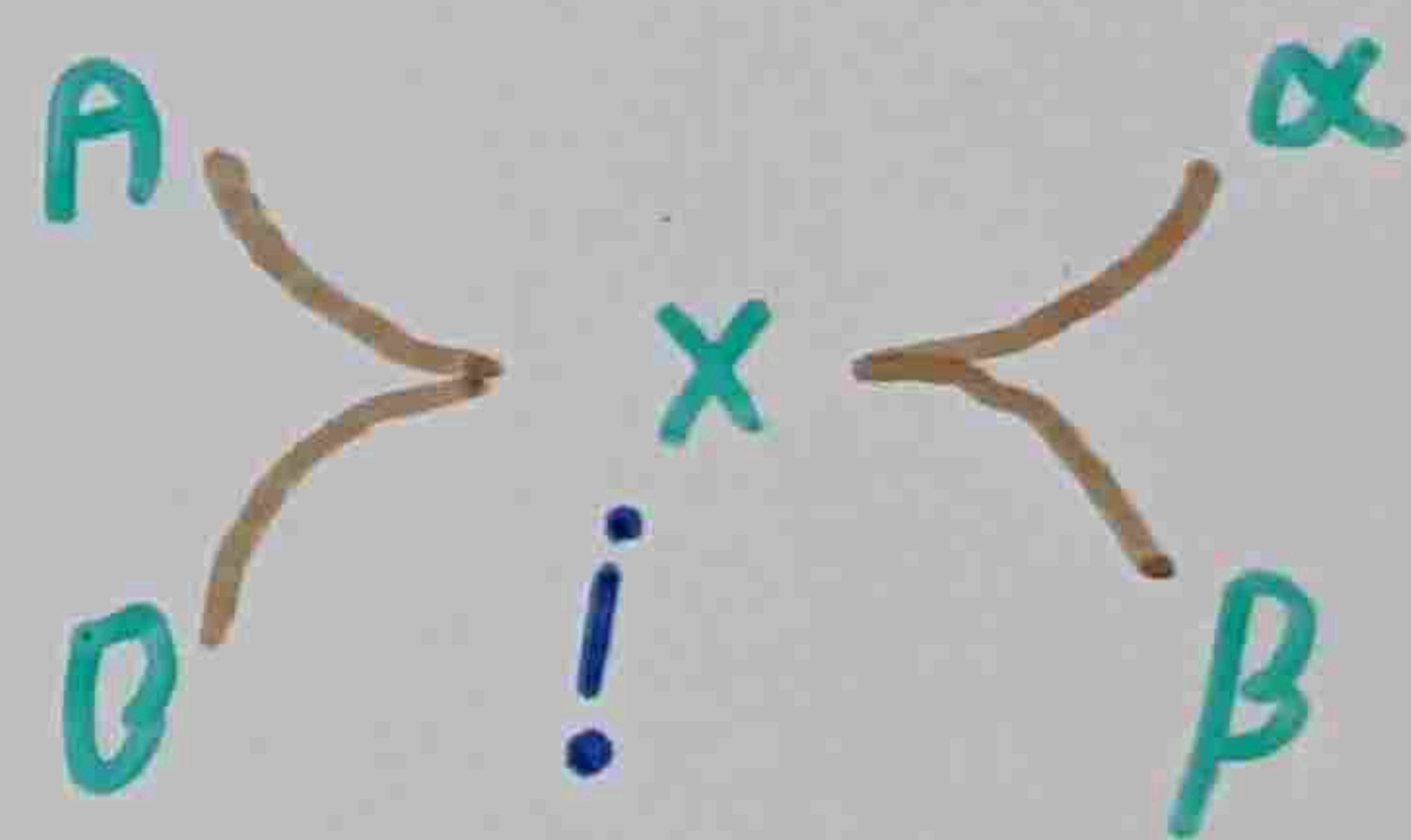
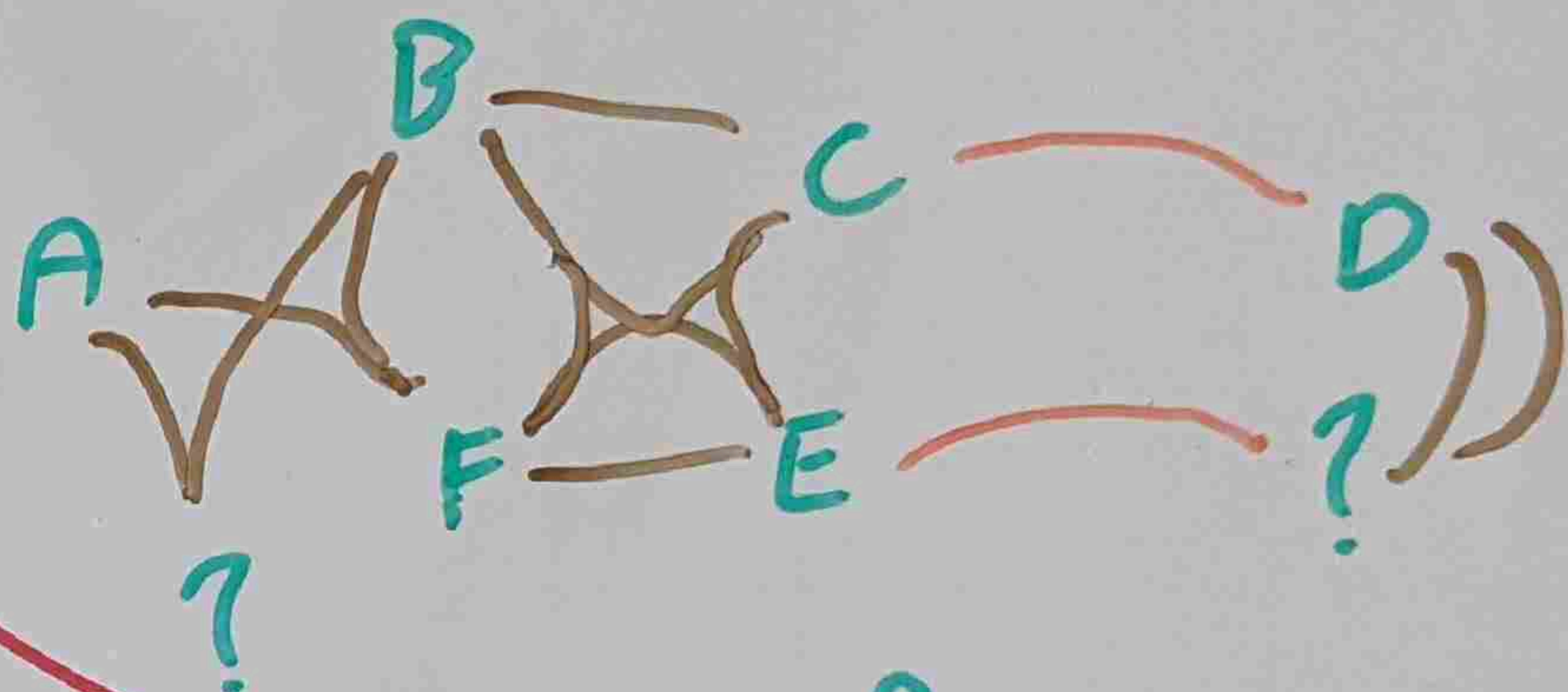
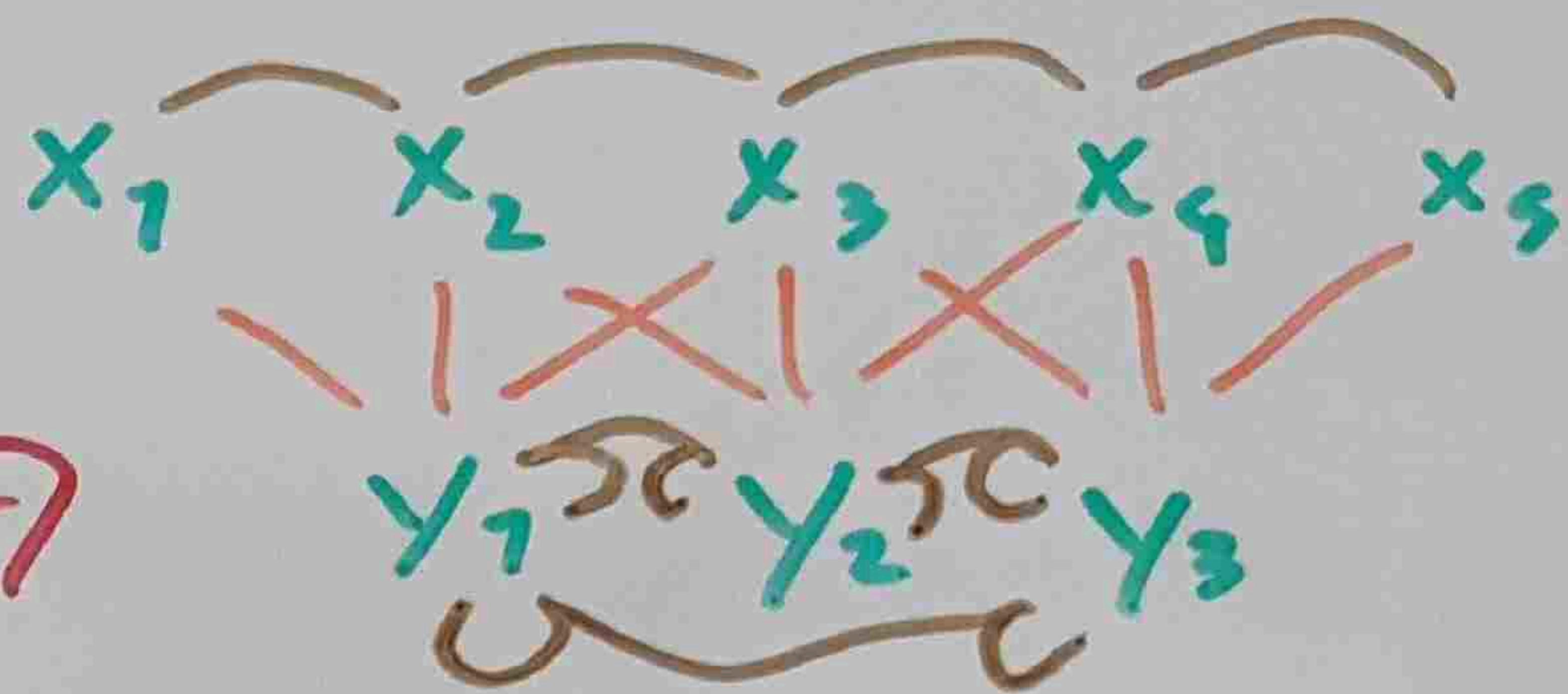
PROBLEMS

RECOGNITION

COMPLETION

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CALCULATION



WHAT CAN IT DO

INCREASING
INFORMATION

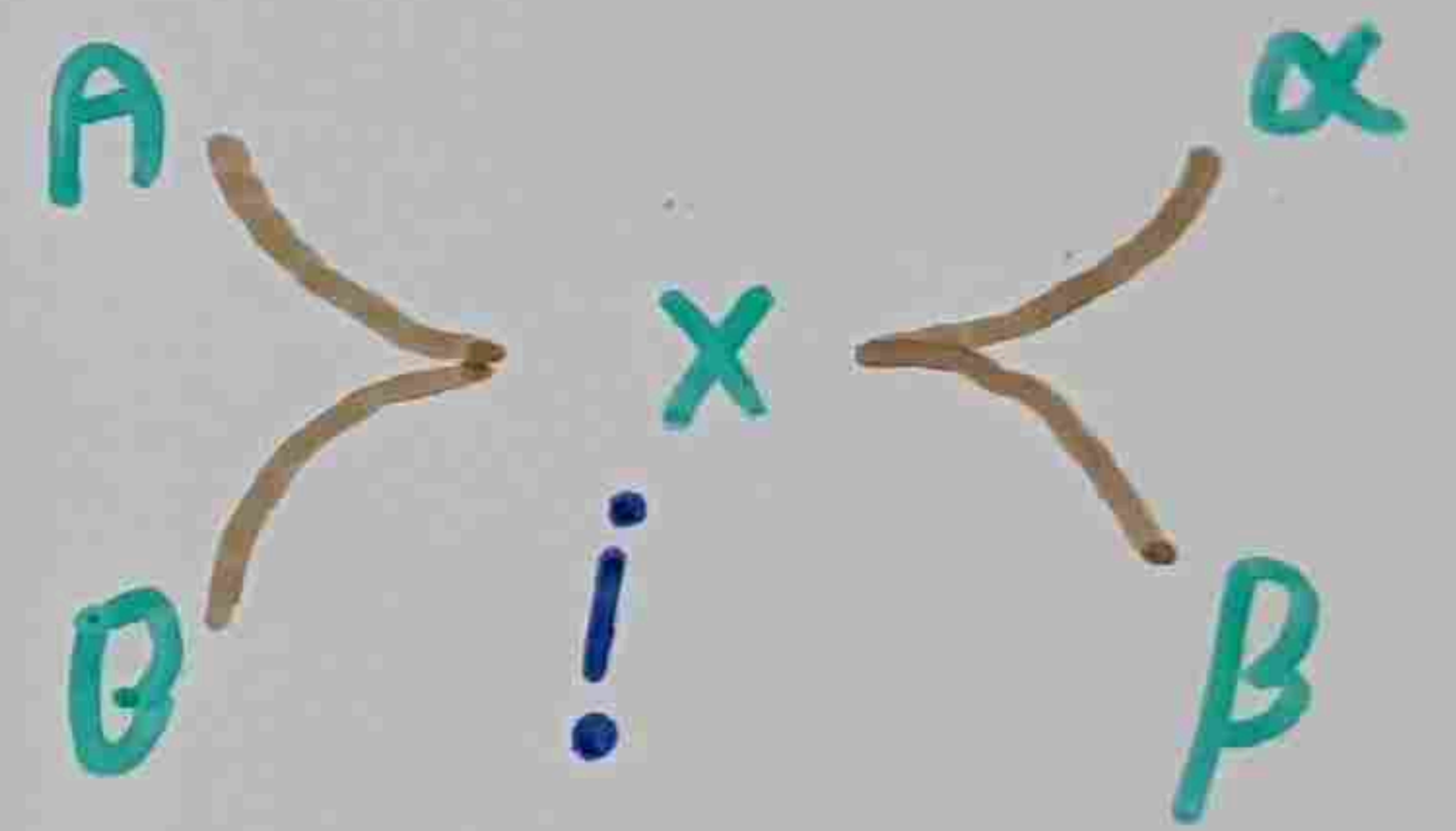
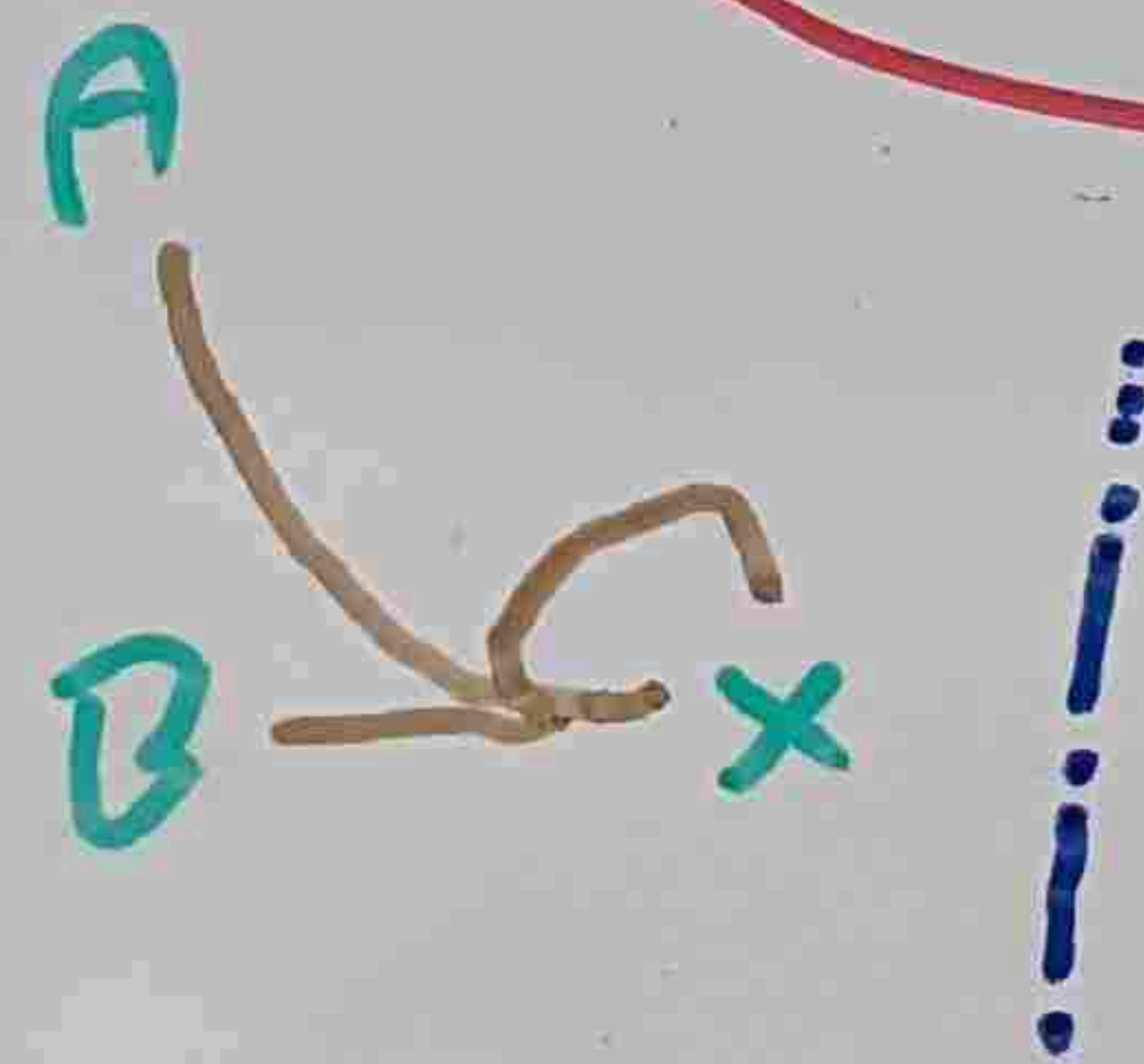
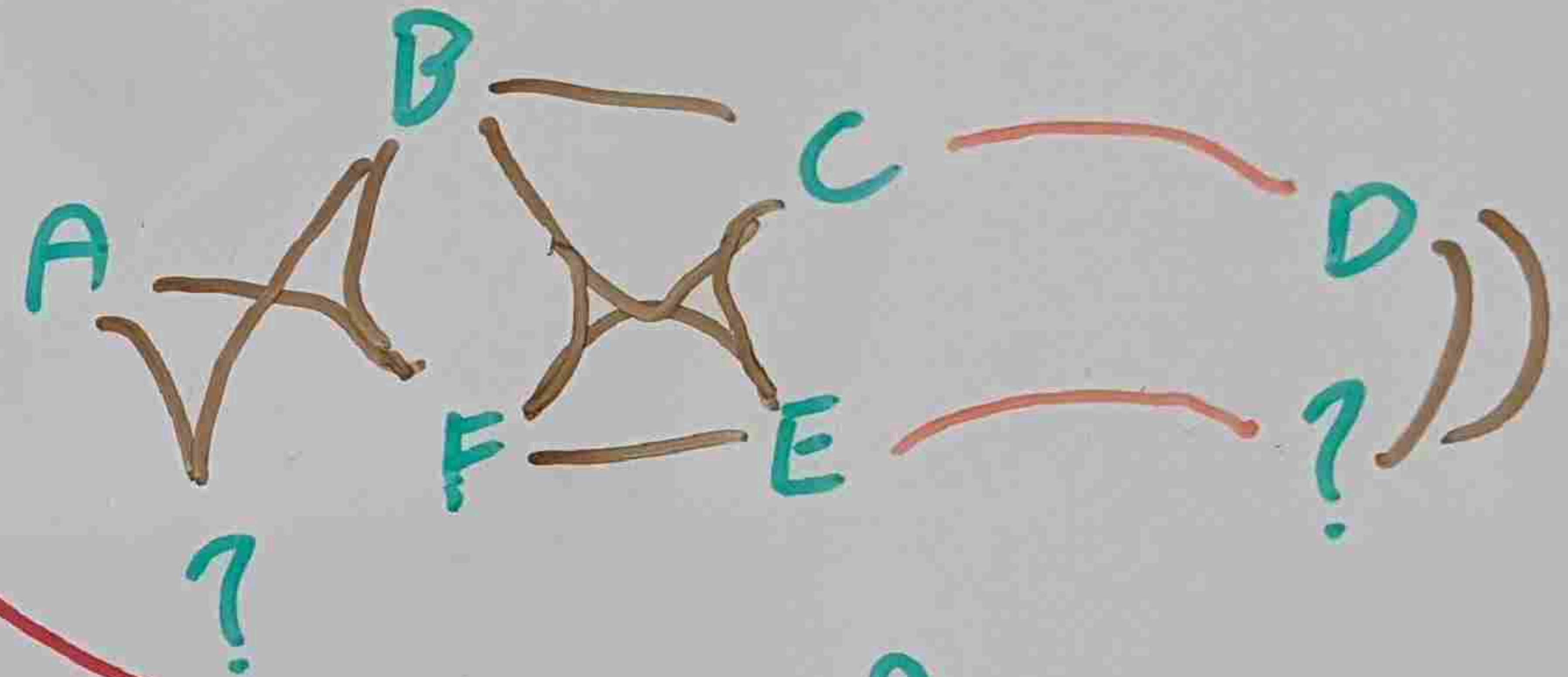
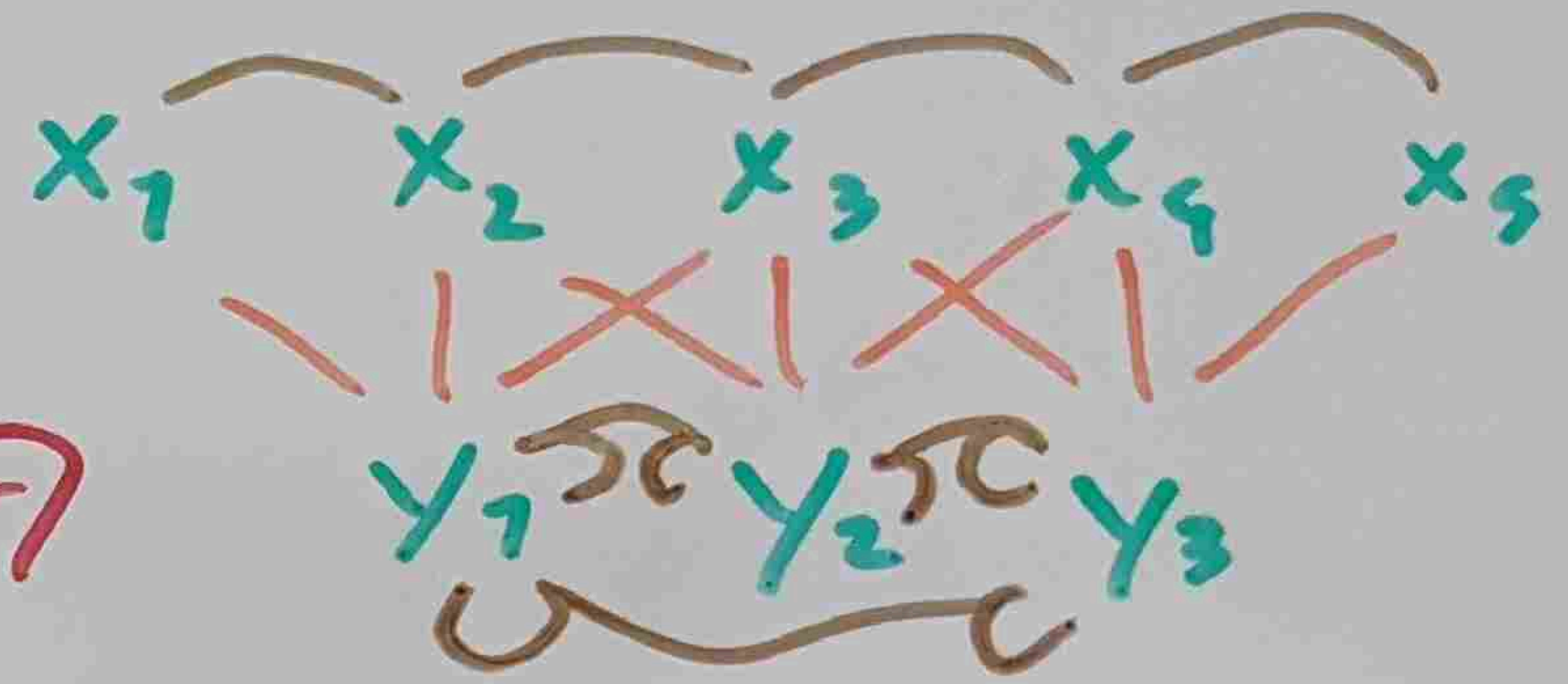
PROBLEMS

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PROBLEMS

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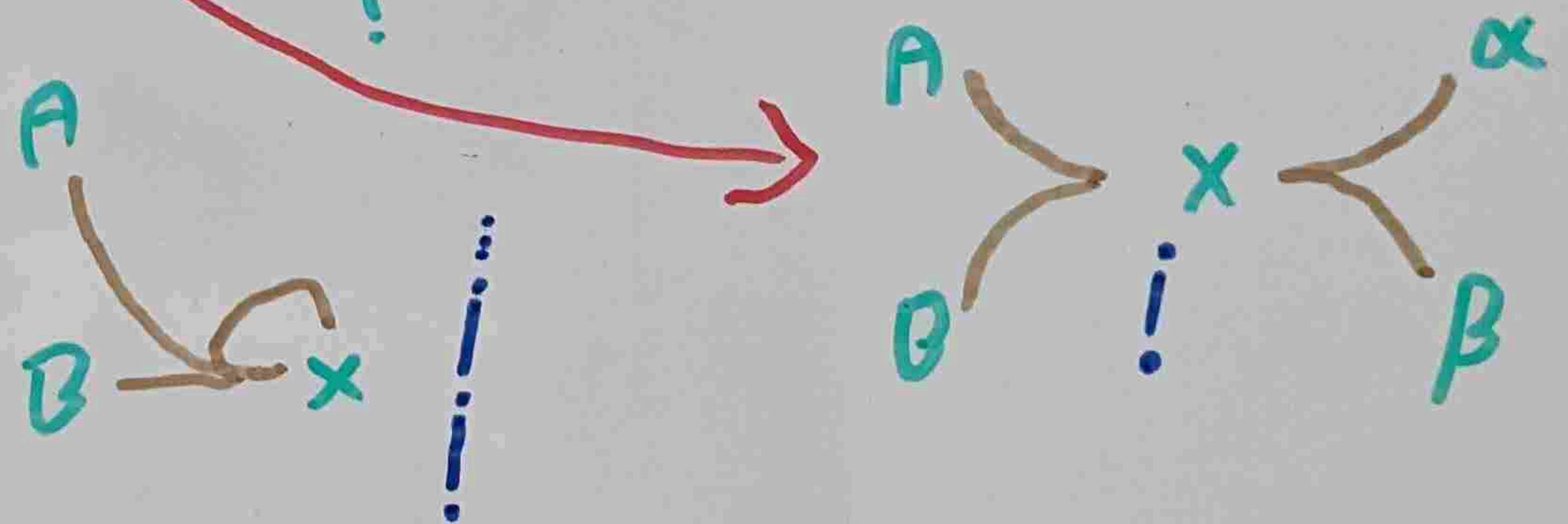
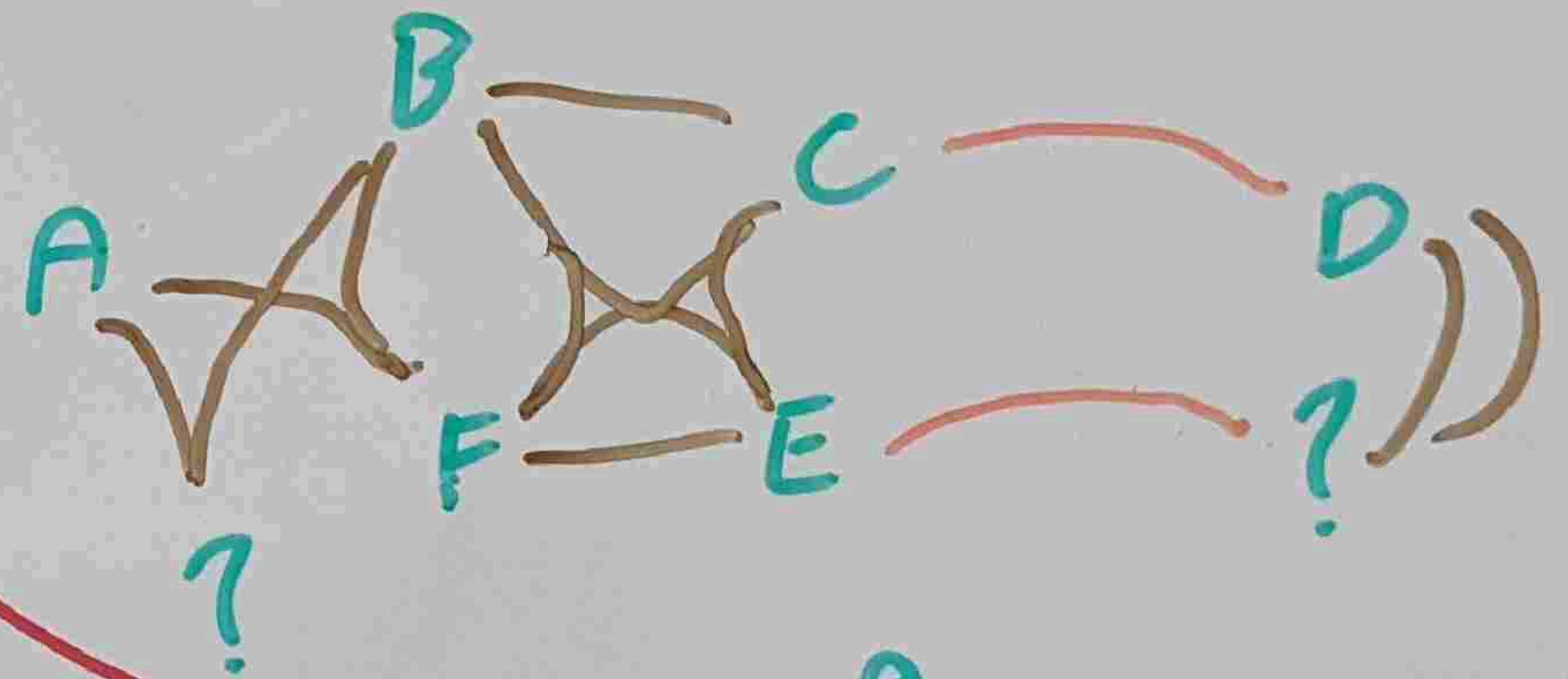
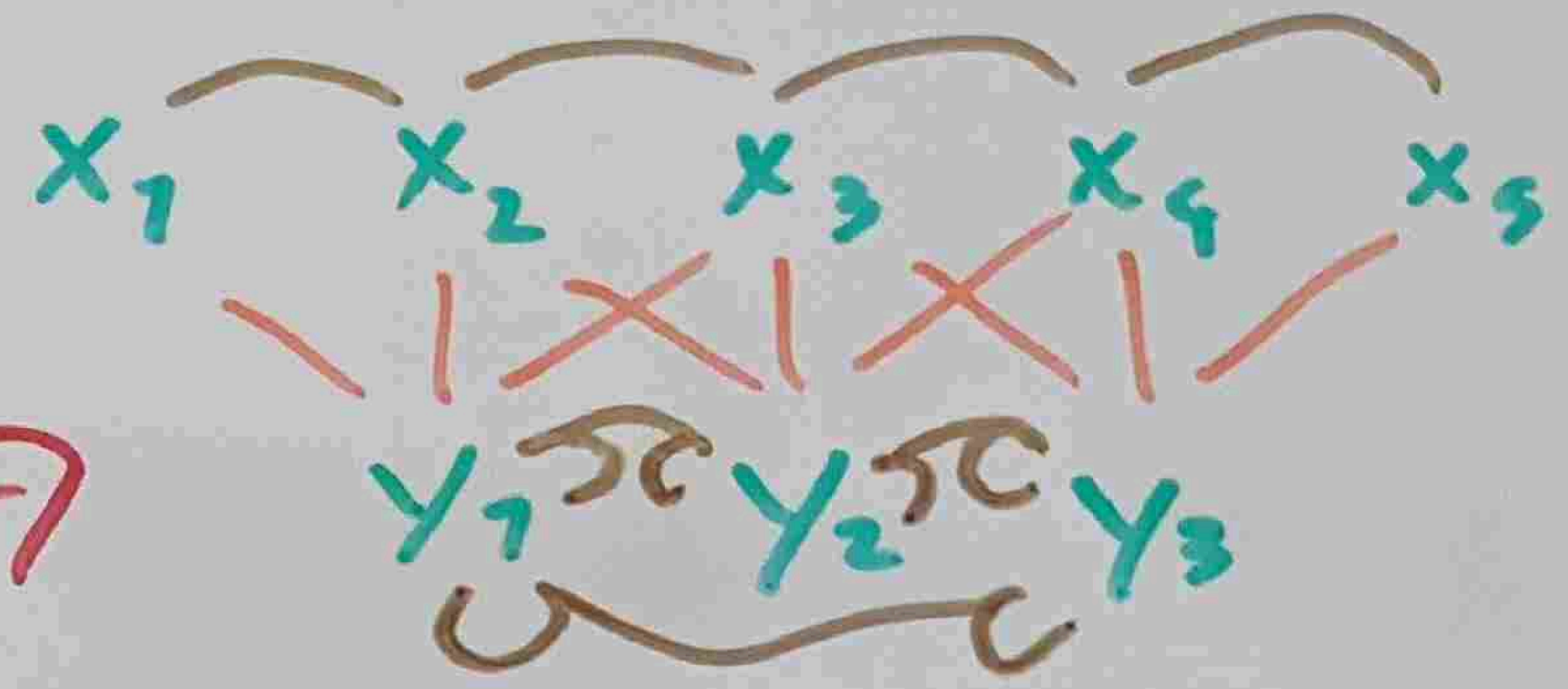
FEATURES

GUARANTEES

MULTI-MODAL

VERSATILE

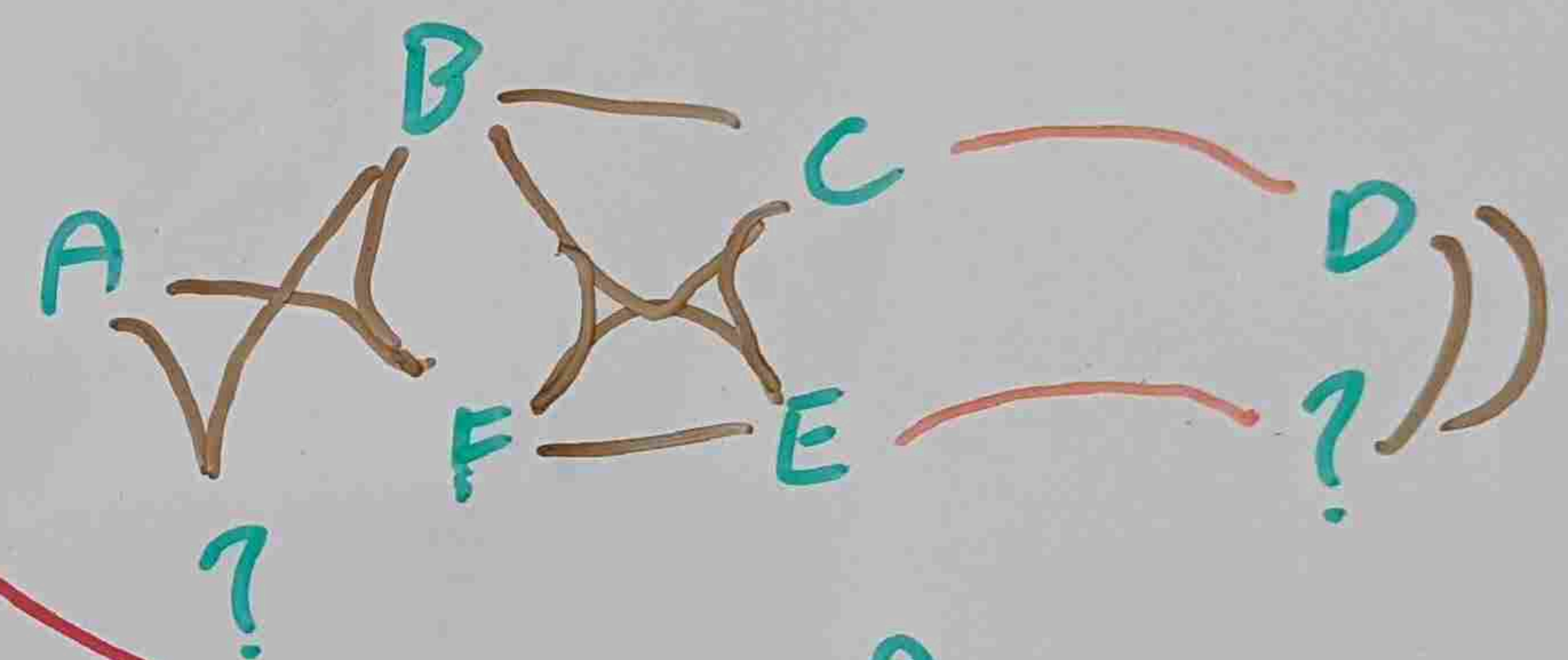
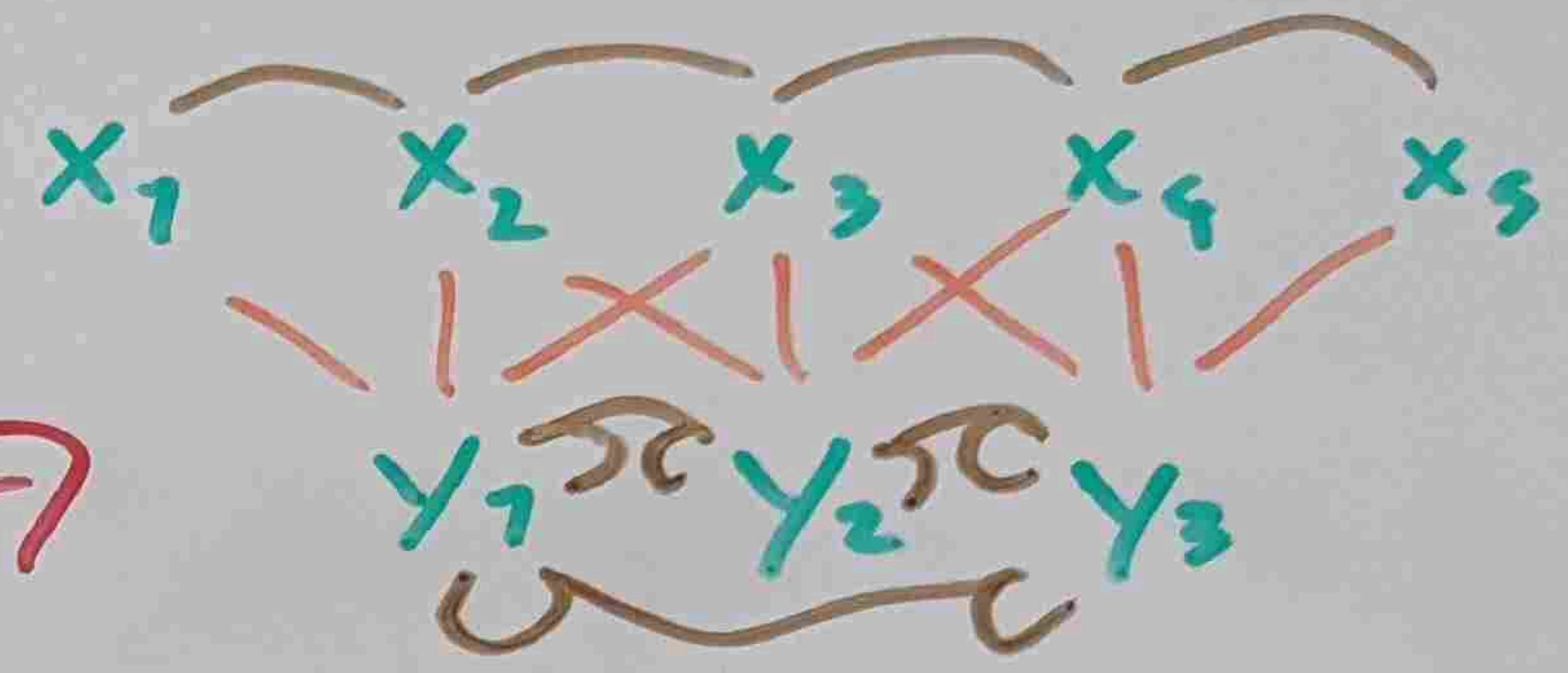
SCALABLE



WHAT CAN IT DO

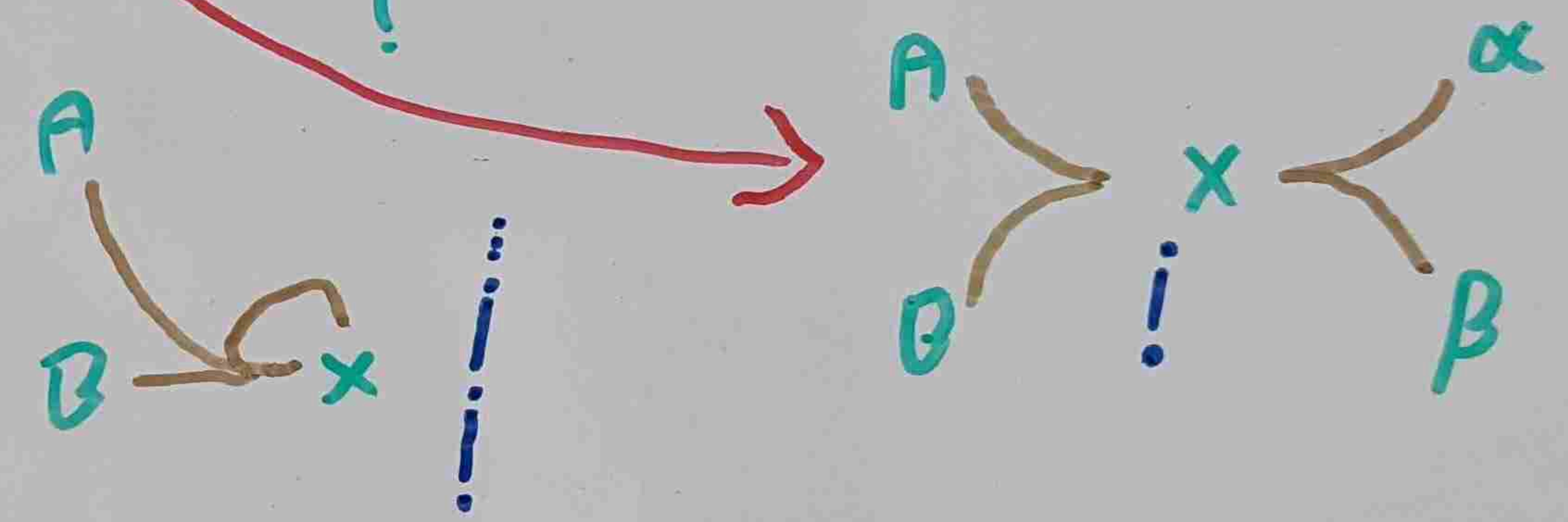
INCREASING INFORMATION

- PROBLEMS
- RECOGNITION
- COMPLETION
- CHECKING
- CALCULATION



- FEATURES
- GUARANTEES
- MULTI-MODAL
- VERSATILE
- SCALABLE

LAW ABIDING



WHAT CAN IT DO

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COMPLETION

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CALCULATION

FEATURES

GUARANTEES

MULTI-MODAL

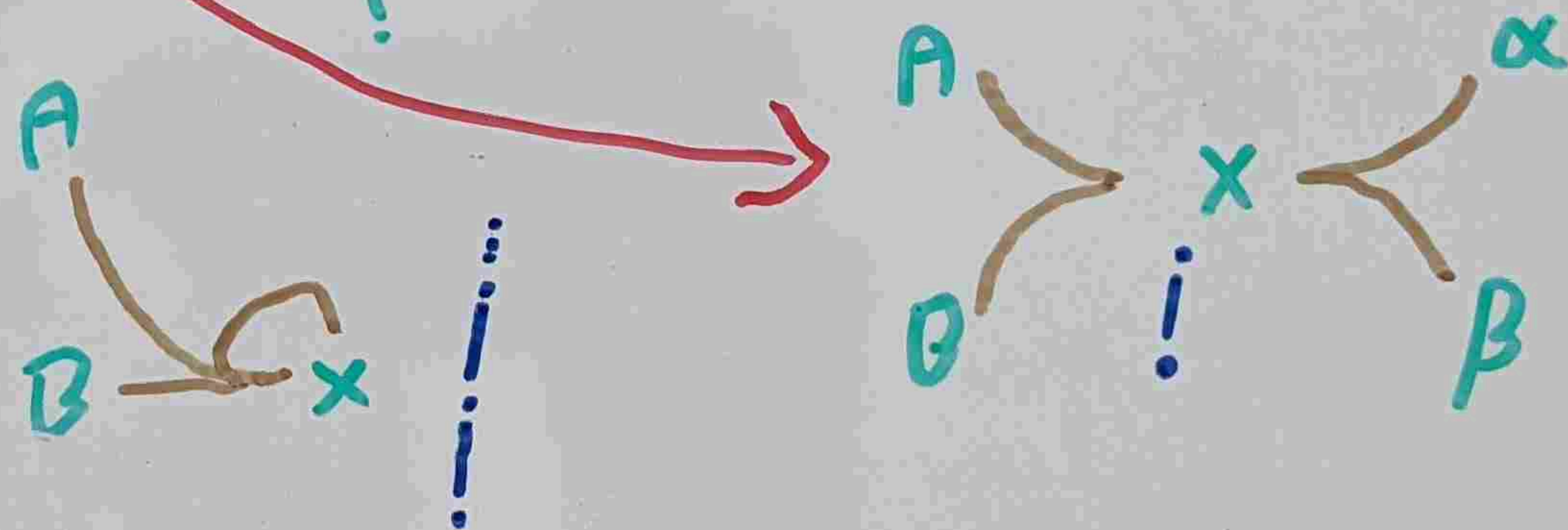
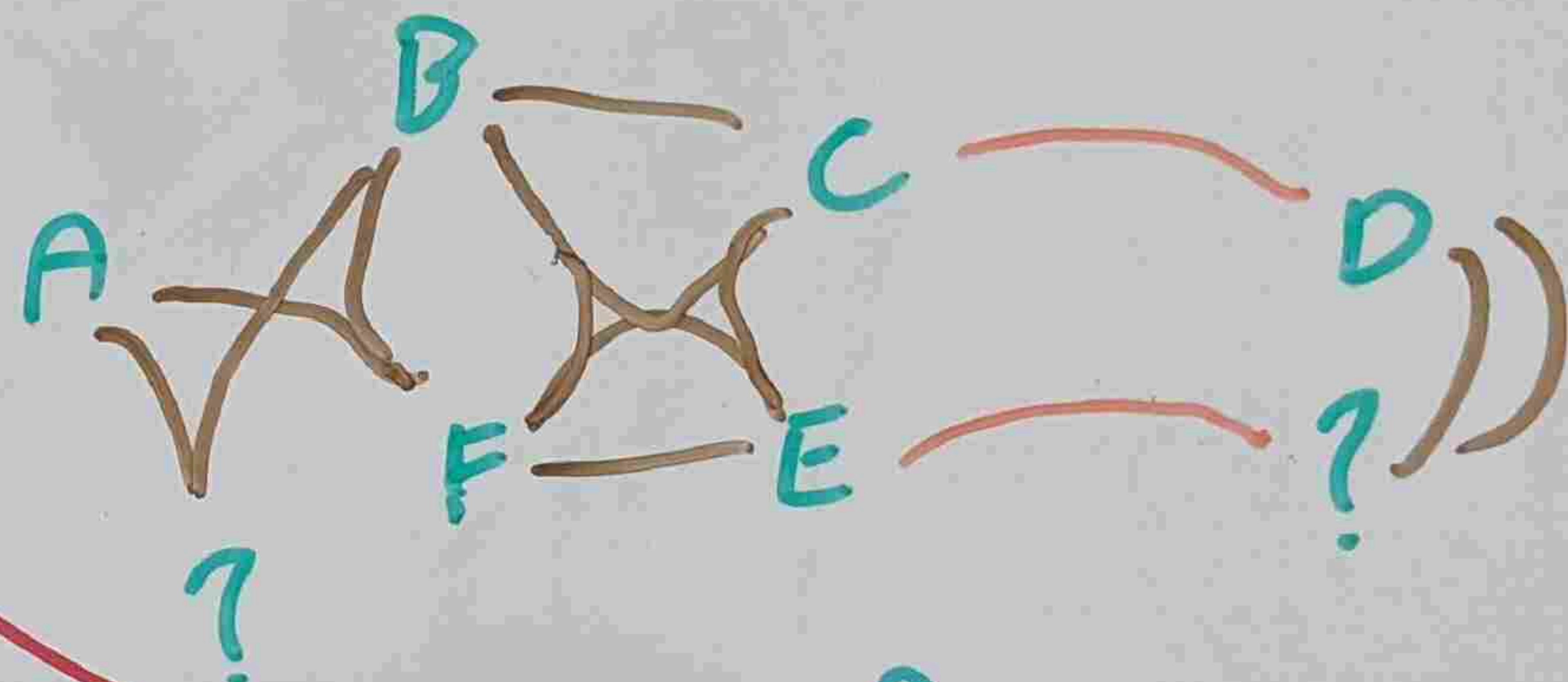
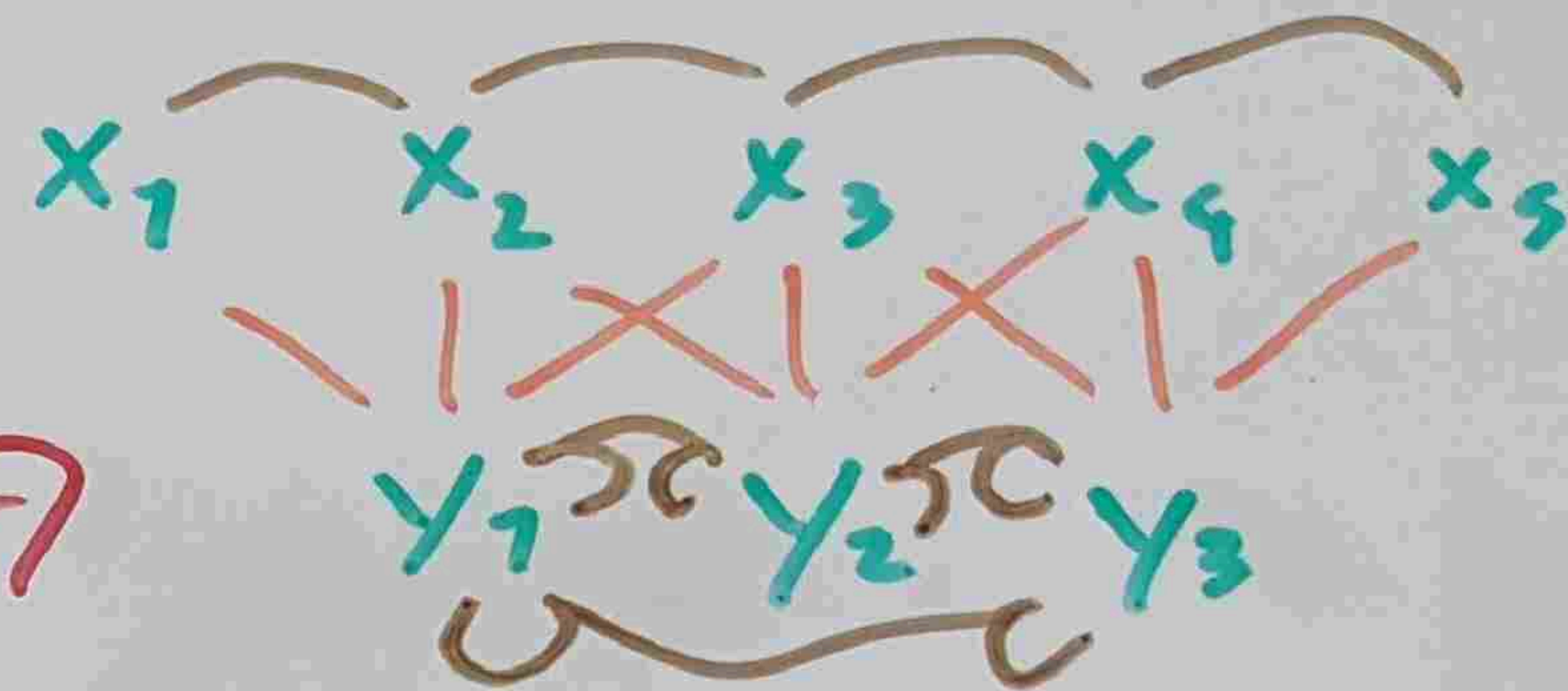
VERSATILE

SCALABLE

INCREASING
INFORMATION

LAW
ABIDING

CTION



INFORMATION ALGEBRA
LATTICES
GALOIS CONNECTIONS

CTION

HOW DOES IT WORK

COMPONENTS

TYPES

CELLS

DEDUCTIONS

EXCHANGES

HOW DOES IT WORK

"WHAT IS THE FORCE ..."

⋮

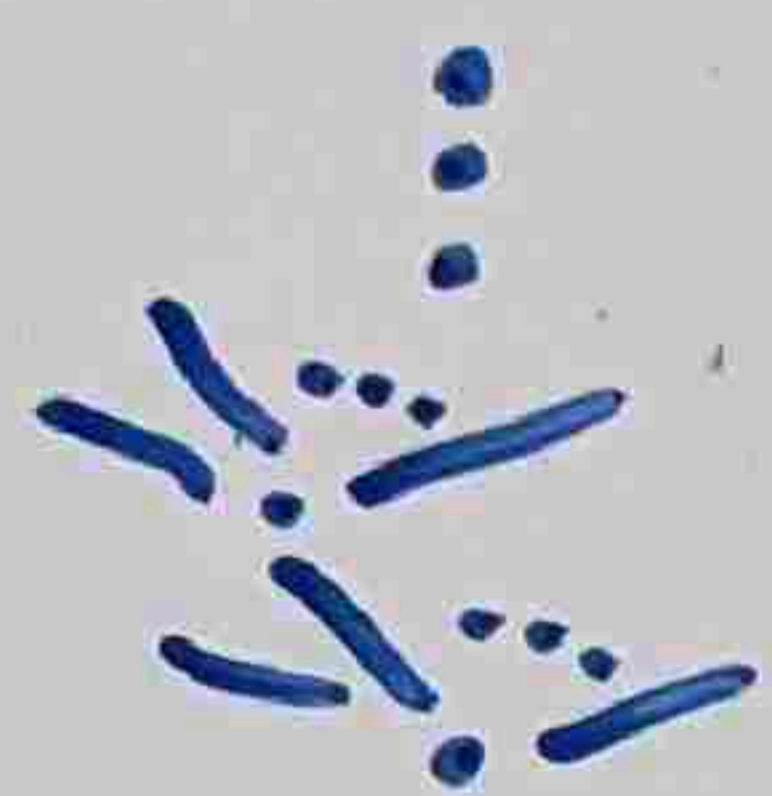
COMPONENTS

TYPES

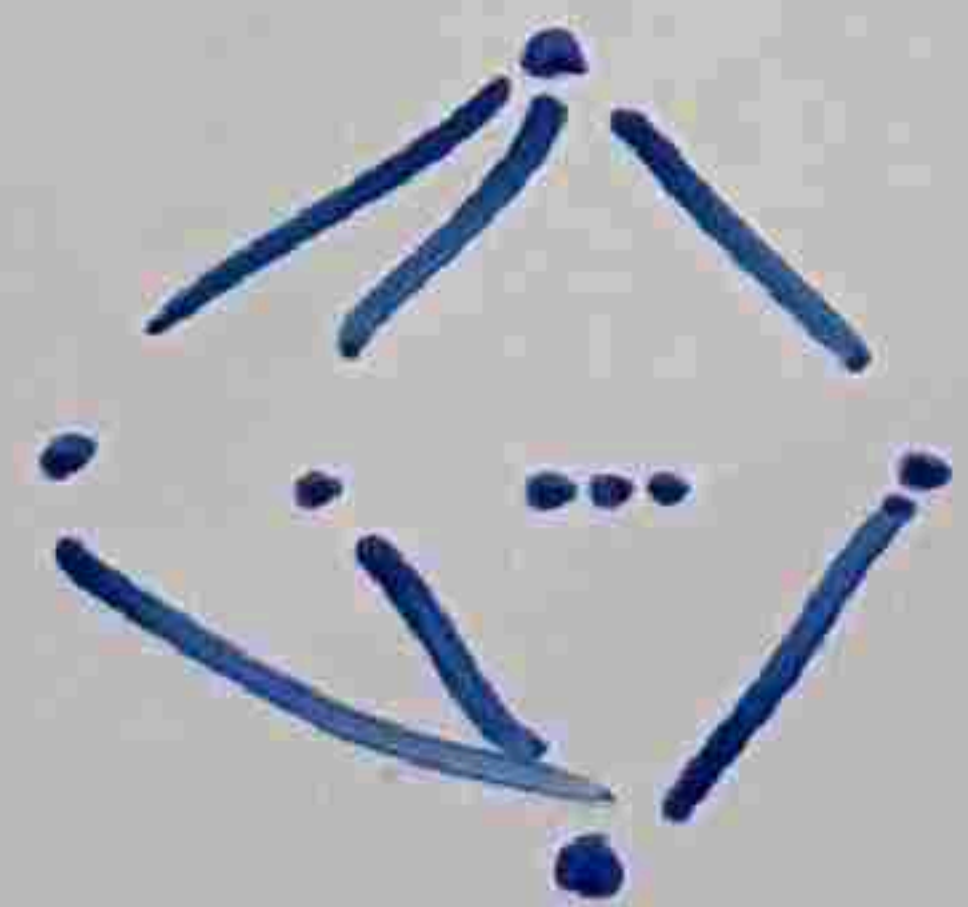
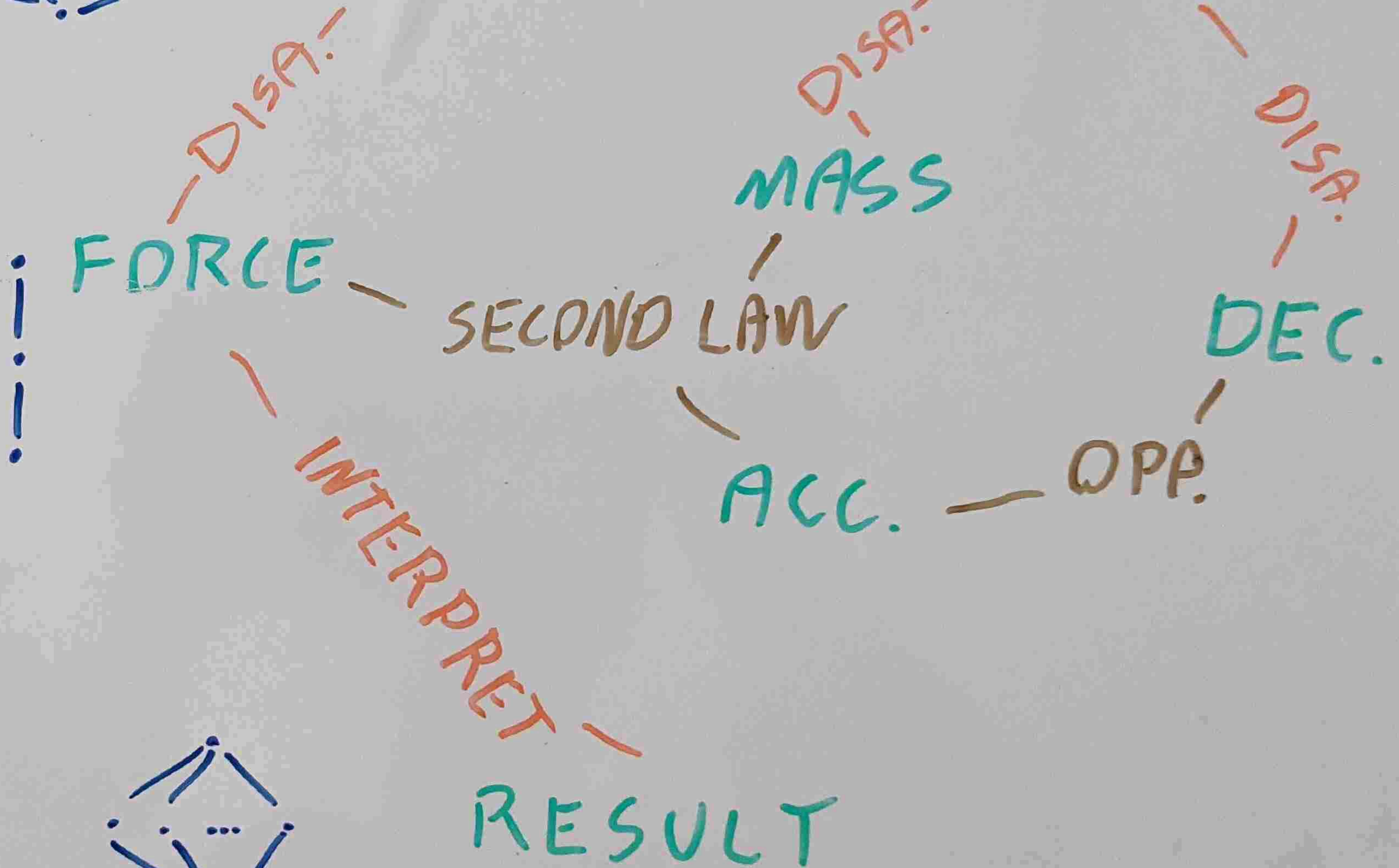
CELLS

DEDUCTIONS

EXCHANGES



PARSE-RESULT-1 PR2 PR3

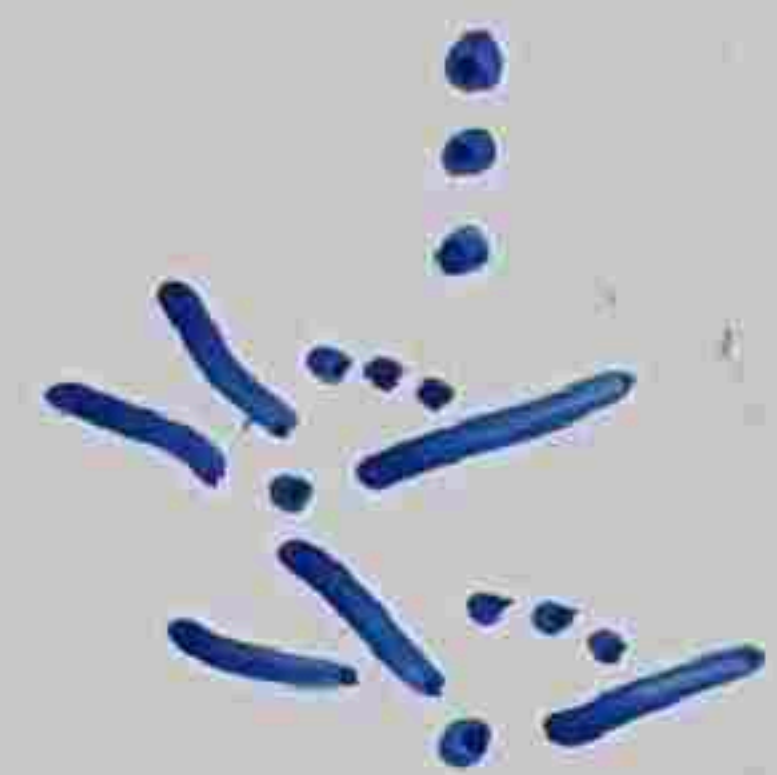


HOW DOES IT WORK

"WHAT IS THE FORCE ..."

⋮

PARSE-RESULT-1 PR2 PR3



DISA!
FORCE

DISA!
MASS

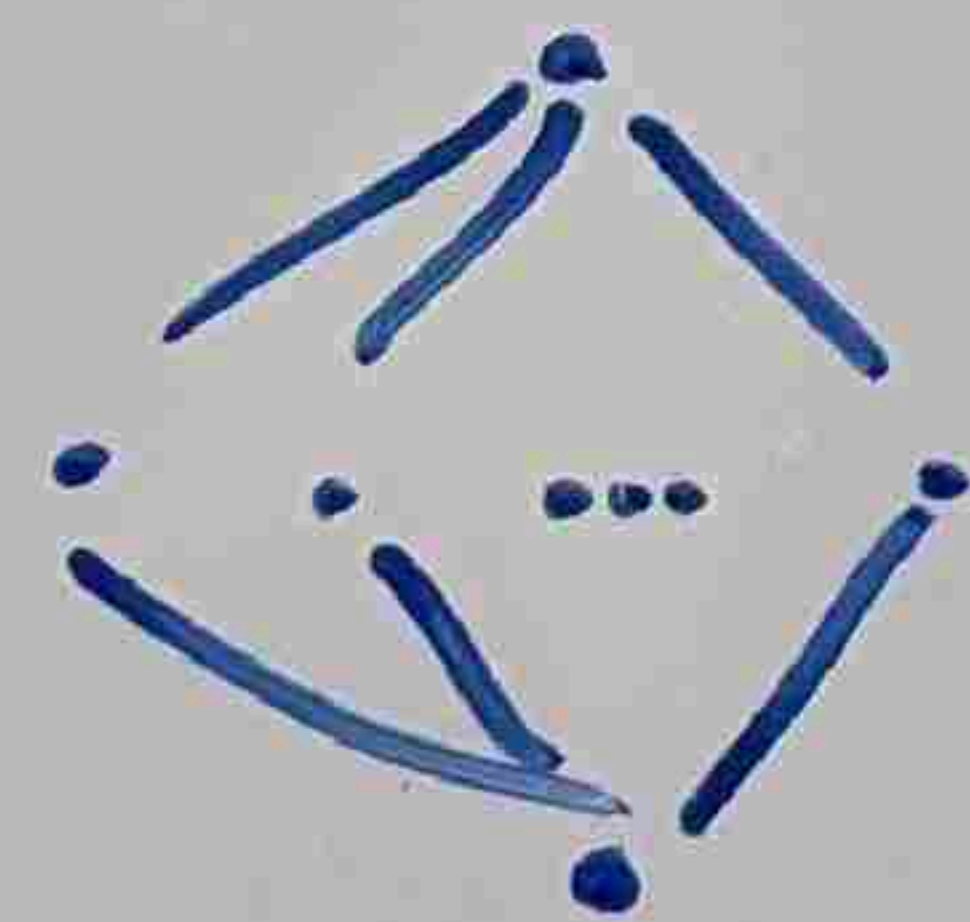
SECOND LAW

DISA!
DEC.

ACC. — OPA

INTERPRET

RESULT



COMPONENTS

TYPES

CELLS

DEDUCTIONS

EXCHANGES

EXECUTION

1. BUILD

2. EXECUTE POLICY

3. READ-OUT & METRICS

⋮

HOW DOES IT WORK

"WHAT IS THE FORCE ..."

1.

COMPONENTS

TYPES

CELLS

DEDUCTIONS

EXCHANGES

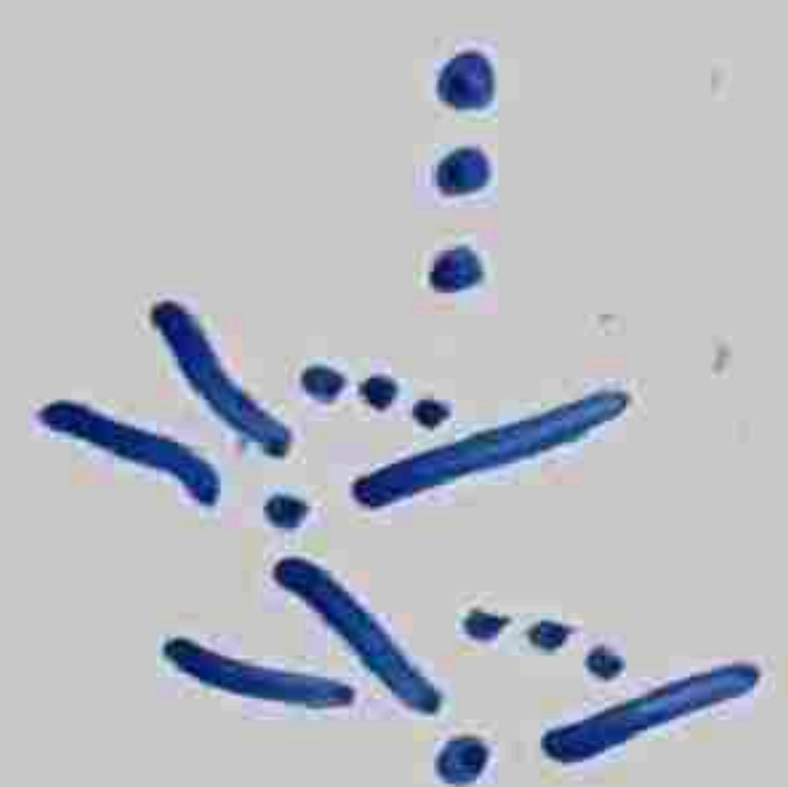
EXECUTION

1. BUILD

2. EXECUTE POLICY

3. READ-OUT & METRICS

EXTENSION



PARSE-RESULT-1 PR2 PR3

FORCE

SECOND LAW

MASS

DEC.

ACC.

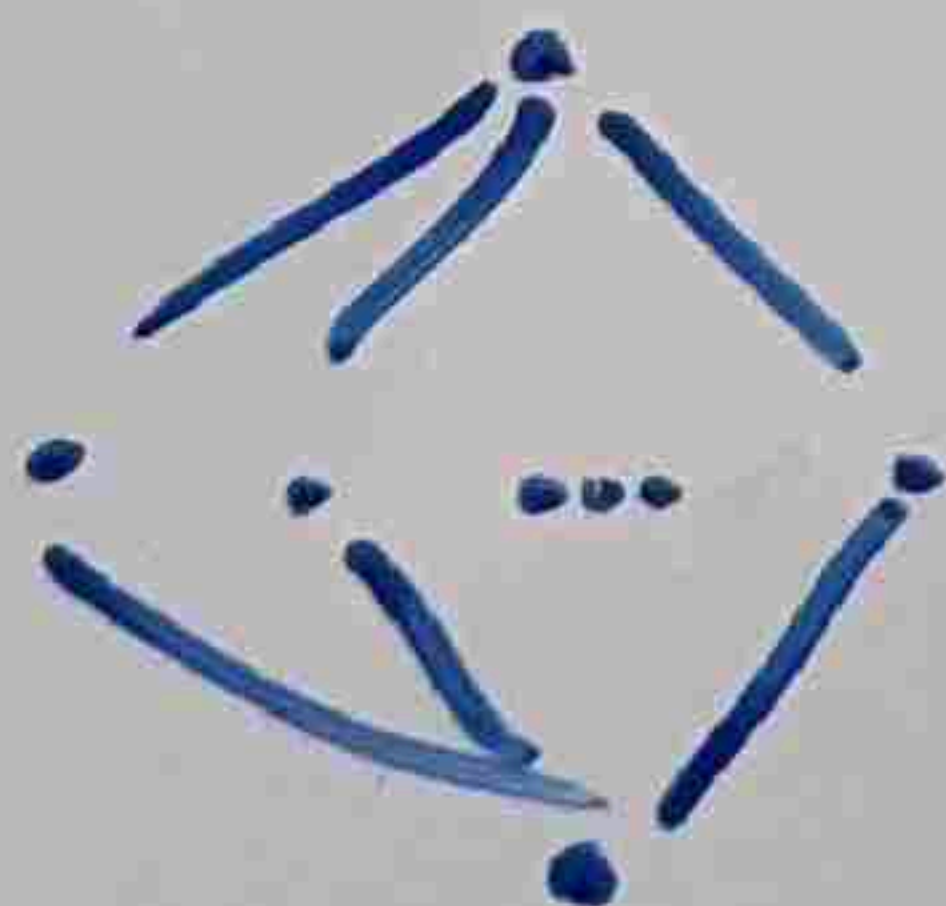
QPA.

2.

INTERPRET

RESULT

3.

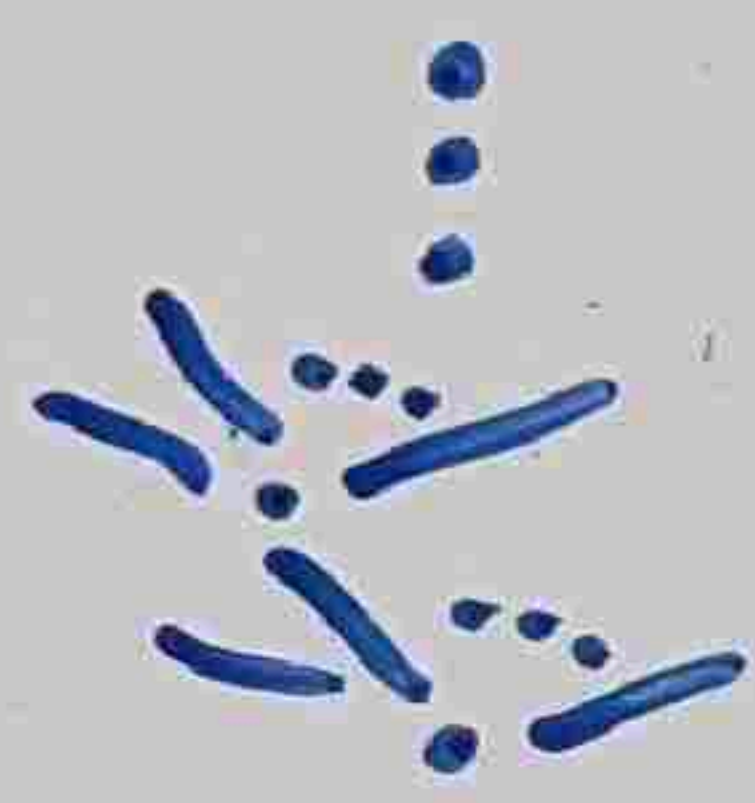


HOW DOES IT WORK

"WHAT IS THE FORCE ..."

1.

- COMPONENTS
- TYPES
- CELLS
- DEDUCTIONS
- EXCHANGES



PARSE-RESULT-1 PR2 PR3

DISA!

FORCE

DISA!
MASS

SECOND LAW

DISA!

DEC.

EXECUTION

1. BUILD
2. EXECUTE POLICY
3. READ-OUT & METRICS



INTERPRET

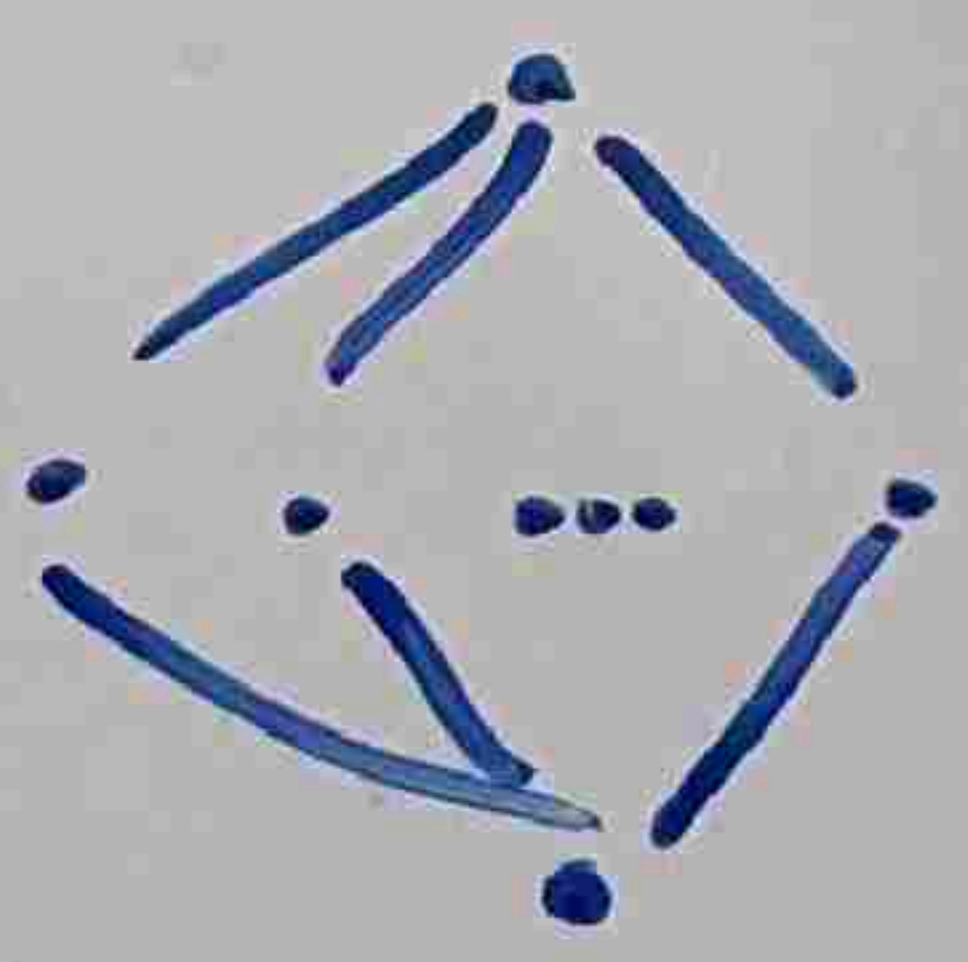
ACC.

OPA.

2.

EXTENSION

- TRANSLATION
- EXAMPLE
- DISCUSSION



RESULT

3.

EXAMPLE

NO TRANSLATION

EXAMPLE

IN CODE!

NO TRANSLATION

TYPES

PARTIAL ORDER

≤ "ALREADY KNOWN"

COMPARABLE

COMP

TYPES

PARTIAL ORDER

\leq "ALREADY KNOWN"

COMPARABLE

BOUNDED SEMILATTICE

\perp "NO INFORMATION"

\vee "JOIN"

TYPES

PARTIAL ORDER

\leq "ALREADY KNOWN"

COMPARABLE

BOUNDED SEMILATTICE

\perp "NO INFORMATION"

\vee "JOIN"

OPTIONALLY

T "OVERCOMPLETE"

ATOM "DEFINITE RESULT"

TYPES

PARTIAL ORDER

\leq "ALREADY KNOWN"

COMPARABLE

BOUNDED SEMILATTICE

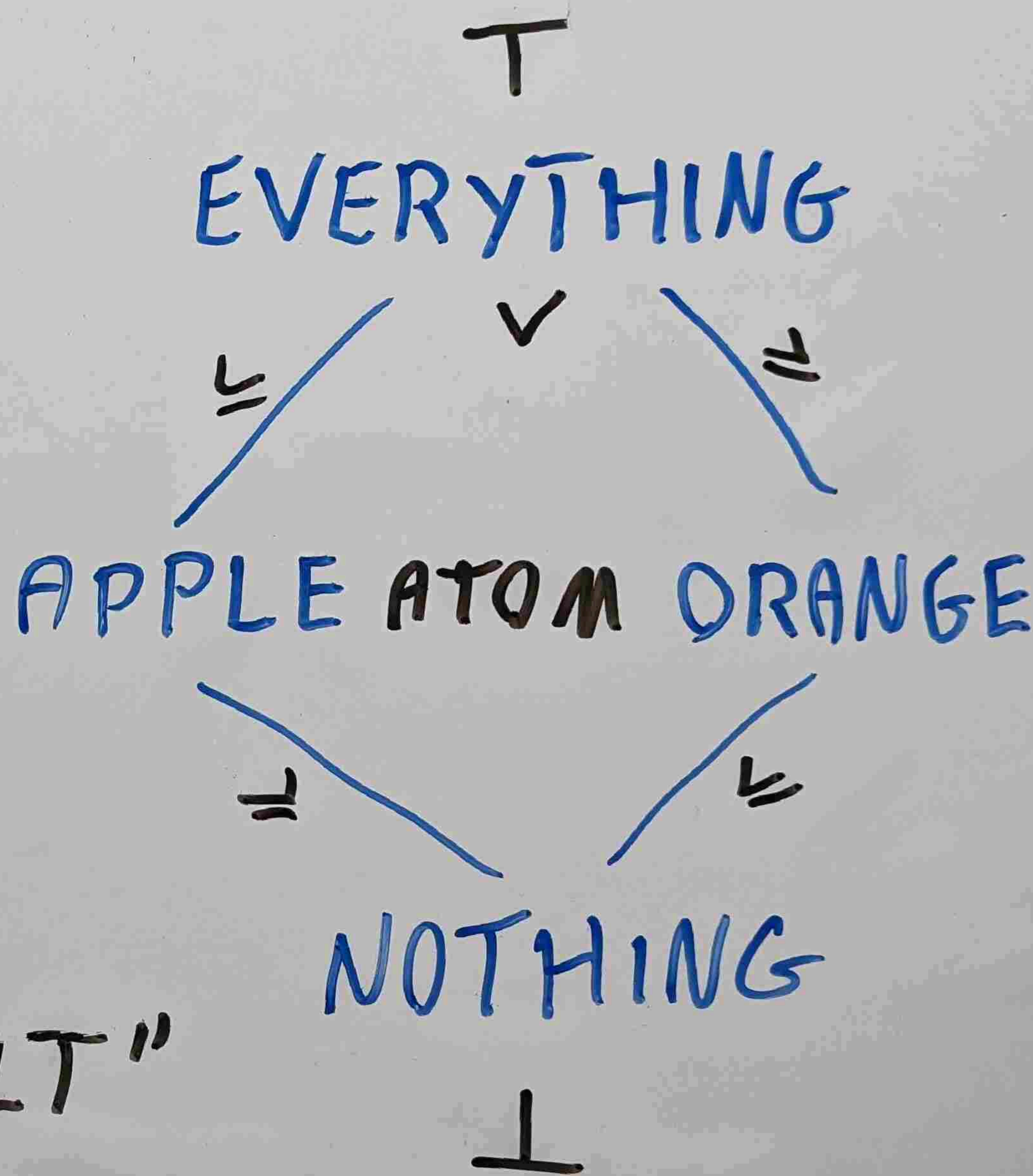
\perp "NO INFORMATION"

\vee "JOIN"

OPTIONALLY

T "OVERCOMPLETE"

ATOM "DEFINITE RESULT"



TYPES

PARTIAL ORDER

\leq "ALREADY KNOWN"

COMPARABLE

BOUNDED SEMILATTICE

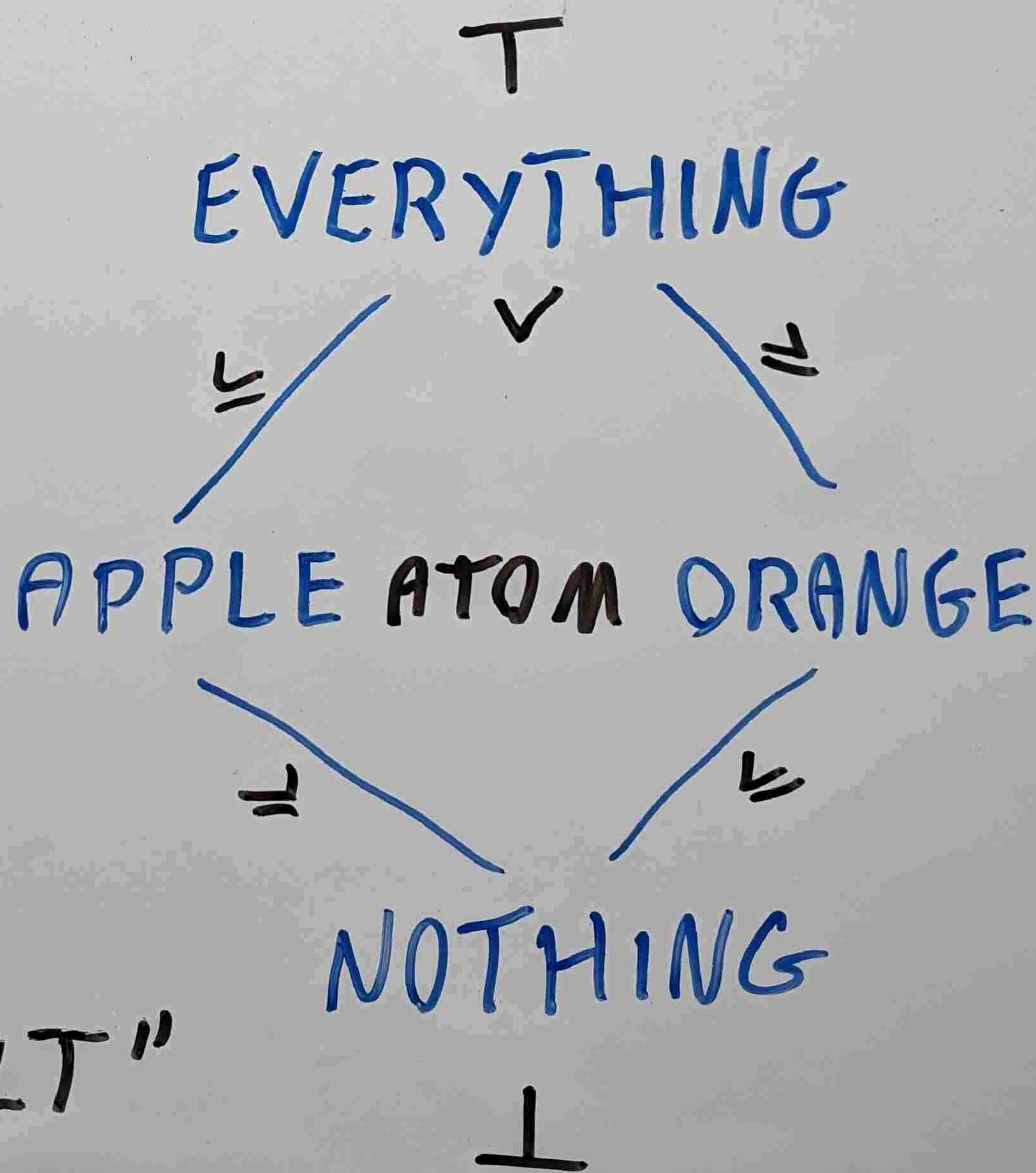
\perp "NO INFORMATION"

\vee "JOIN"

OPTIONALLY

T "OVERCOMPLETE"

ATOM "DEFINITE RESULT"



$$x \leq y \Leftrightarrow x \vee y = y$$

CELLS

BUILD TIME

SPECIFY TYPE

CONTAINER

LABELLED / GROUPED

CELLS

BUILD TIME

SPECIFY TYPE

CONTAINER

LABELED / GROUPED

RUN TIME

STARTS AT \perp

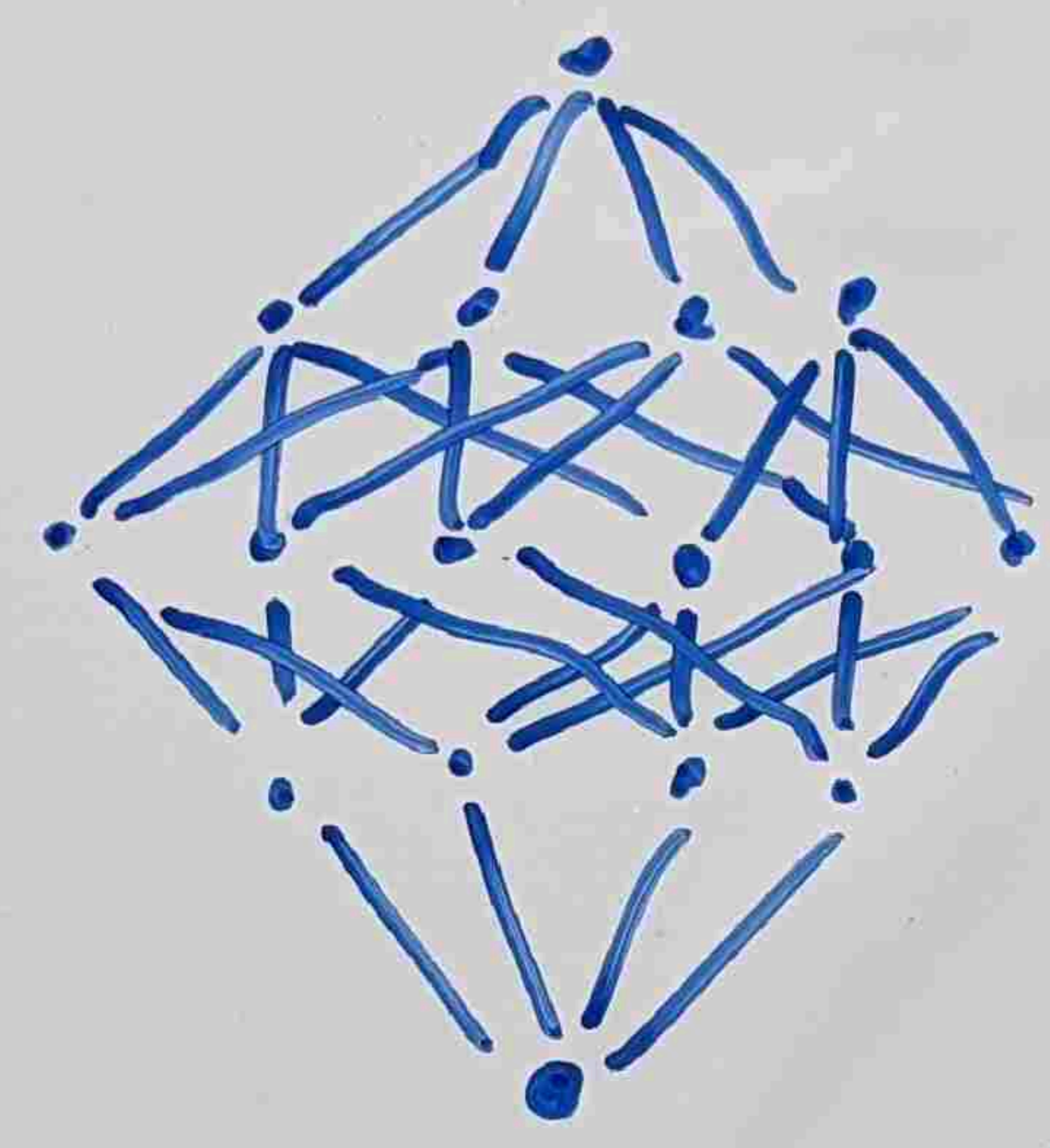
UPDATED WITH v

METRICS / PROPERTIES

USED IN TRANSFORMATIONS

CELLS

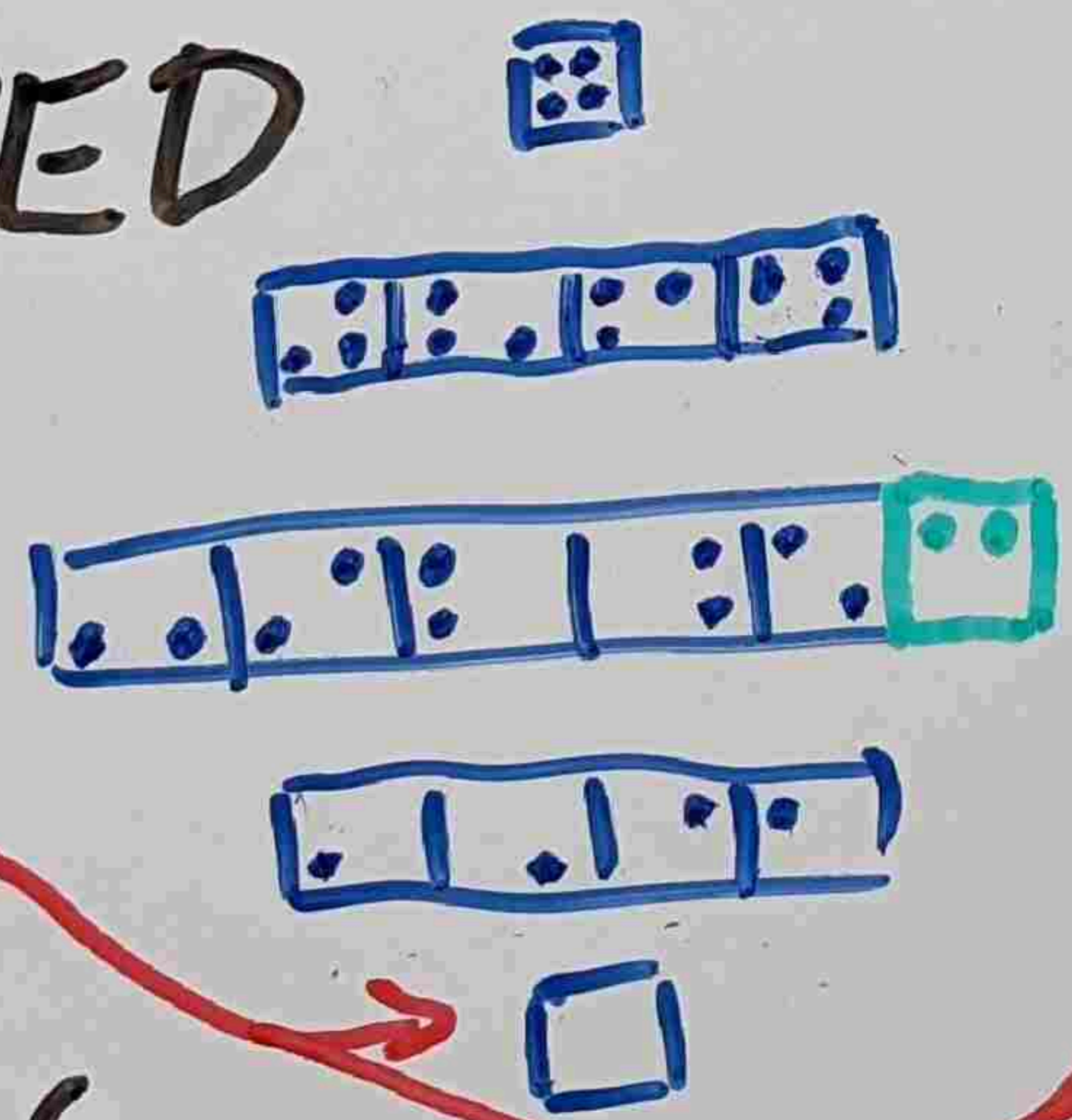
BUILD TIME
 SPECIFY TYPE
 CONTAINER
 LABELED / GROUPED



OBSERVATION

CONCLUSION !

RUN TIME
 STARTS AT \perp
 UPDATED WITH v
 METRICS / PROPERTIES
 USED IN TRANSFORMATIONS



$$\square \vee \square = \square$$

$$\text{TRUE} \vee \text{FALSE} = \text{TRUE}$$

TRUE

FALSE

DEDUCTIONS

PARTIAL FUNCTION

HOST LANGUAGE

DEFINED AT

ONENTS

DEDUCTIONS

PARTIAL FUNCTION

HOST LANGUAGE

DEFINED AT

BETWEEN CELLS

MANY TO MANY

(OF THE SAME TYPE)

ONMENTS

DEDUCTIONS

PARTIAL FUNCTION

HOST LANGUAGE

DEFINED AT

BETWEEN CELLS

MANY TO MANY

(OF THE SAME TYPE)

INCREASING INFORMATION

DISCARD OPTIONS

ADD FEATURES

IMPROVE RESULT

ONENTS

DEDUCTIONS

PARTIAL FUNCTION(S)

HOST LANGUAGE

DEFINED AT

BETWEEN CELLS

MANY TO MANY

(OF THE SAME TYPE)

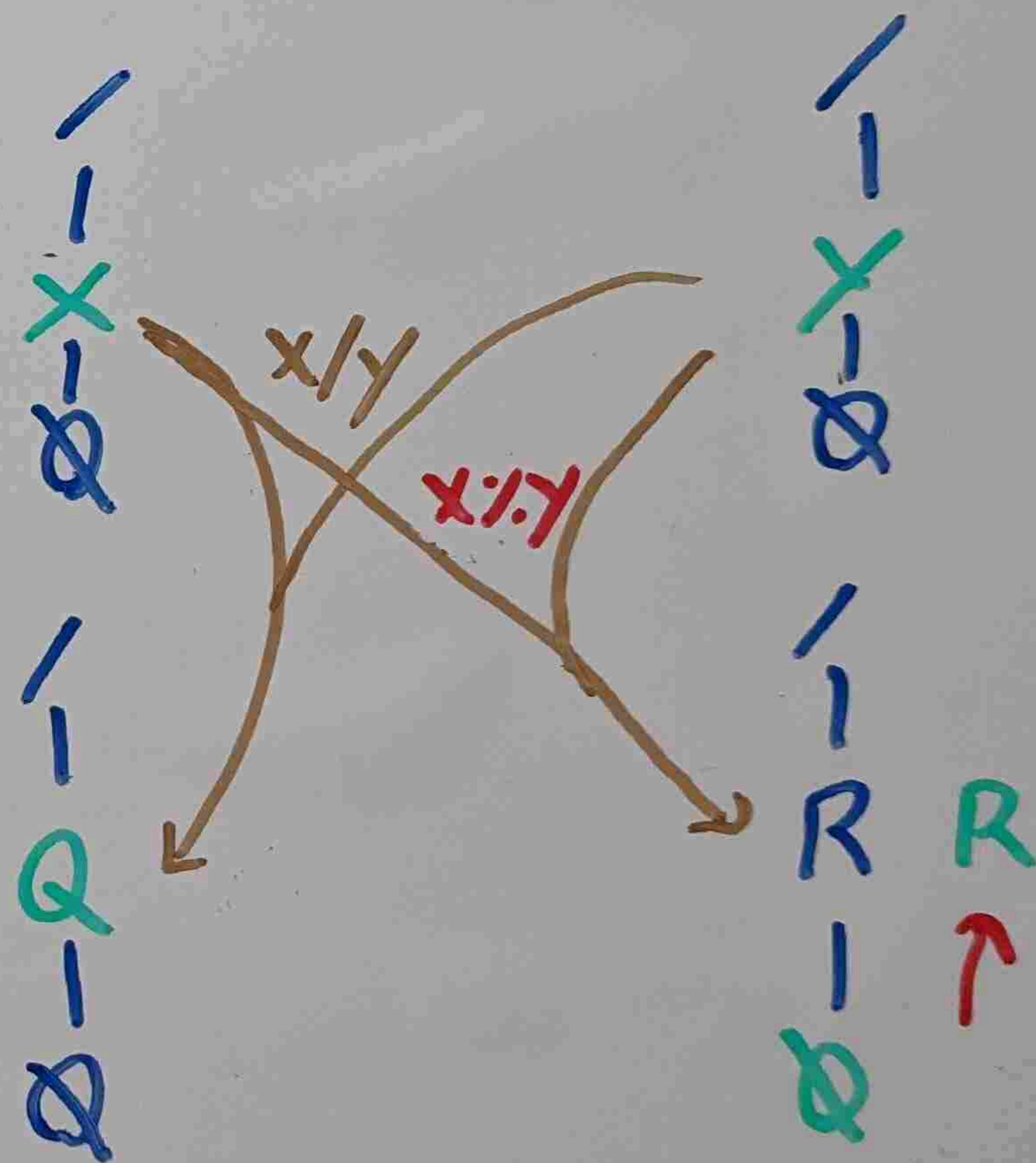
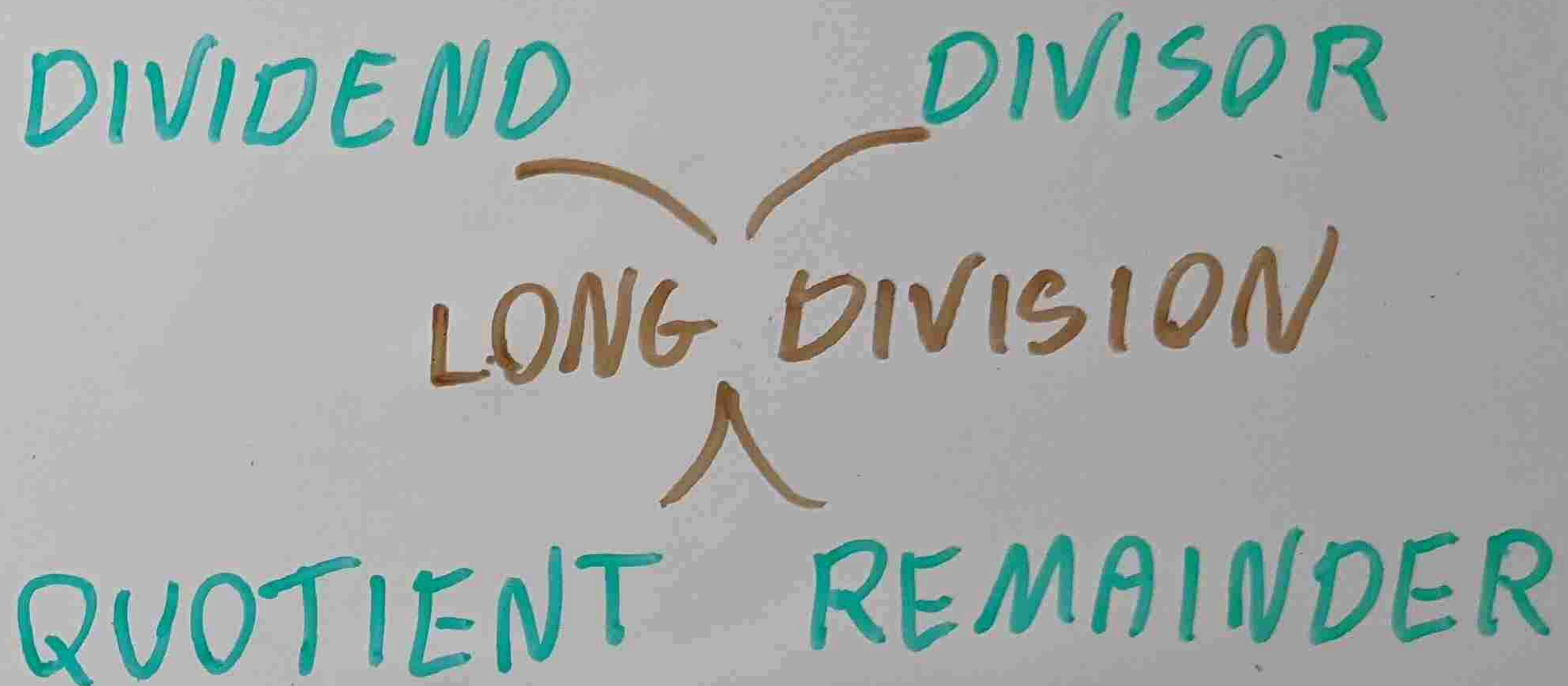
INCREASING INFORMATION

DISCARD OPTIONS

ADD FEATURES

IMPROVE RESULT

ONMENTS



ONENTS

EXCHANGES

LIKE DEDUCTIONS BUT
BETWEEN DIFFERENT TYPES
ONE TO ONE

ONENTS)

EXCHANGES

LIKE DEDUCTIONS BUT
BETWEEN DIFFERENT TYPES
ONE TO ONE
WITH EXTRA
BIDIRECTIONALITY
MONOTONICITY

ONENTS

EXCHANGES

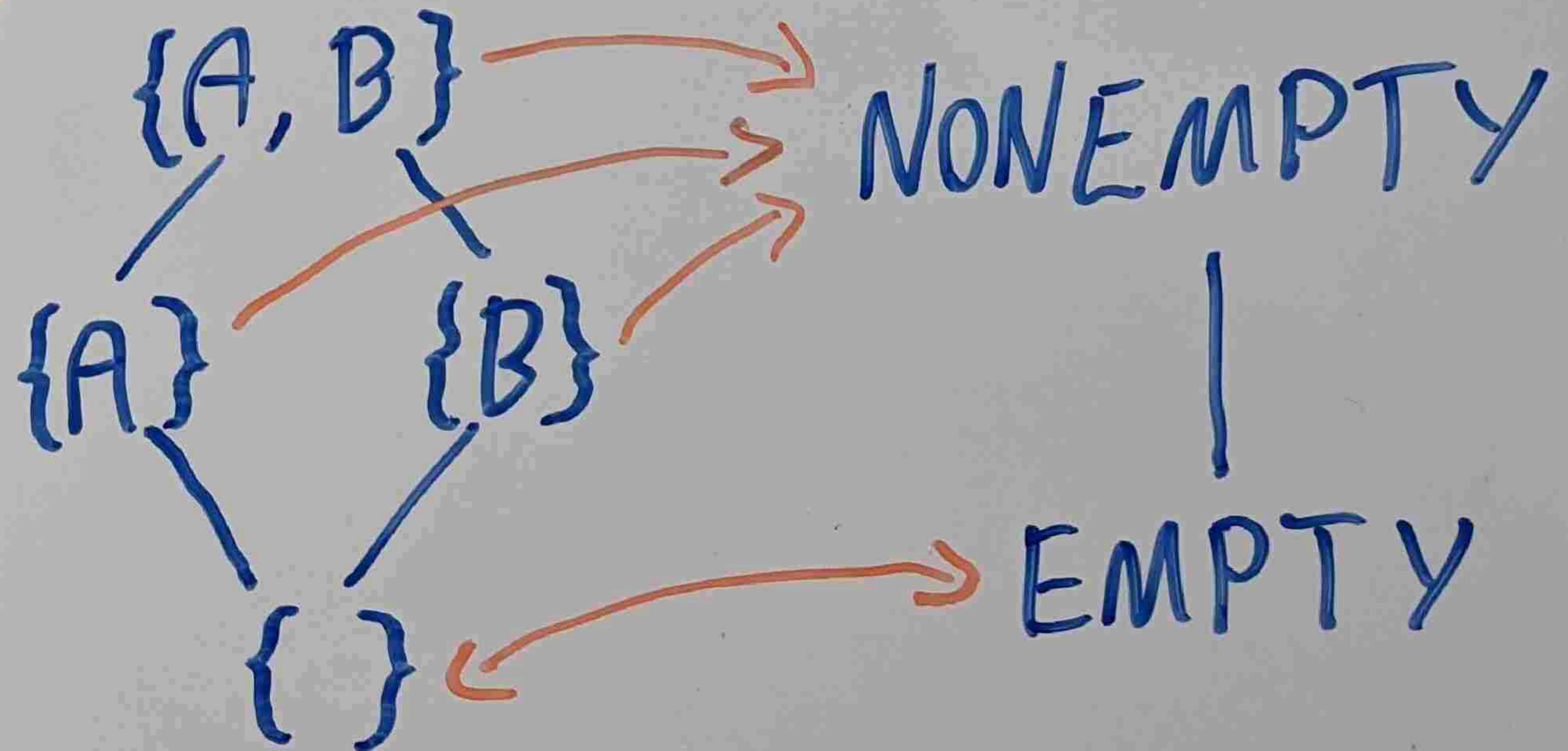
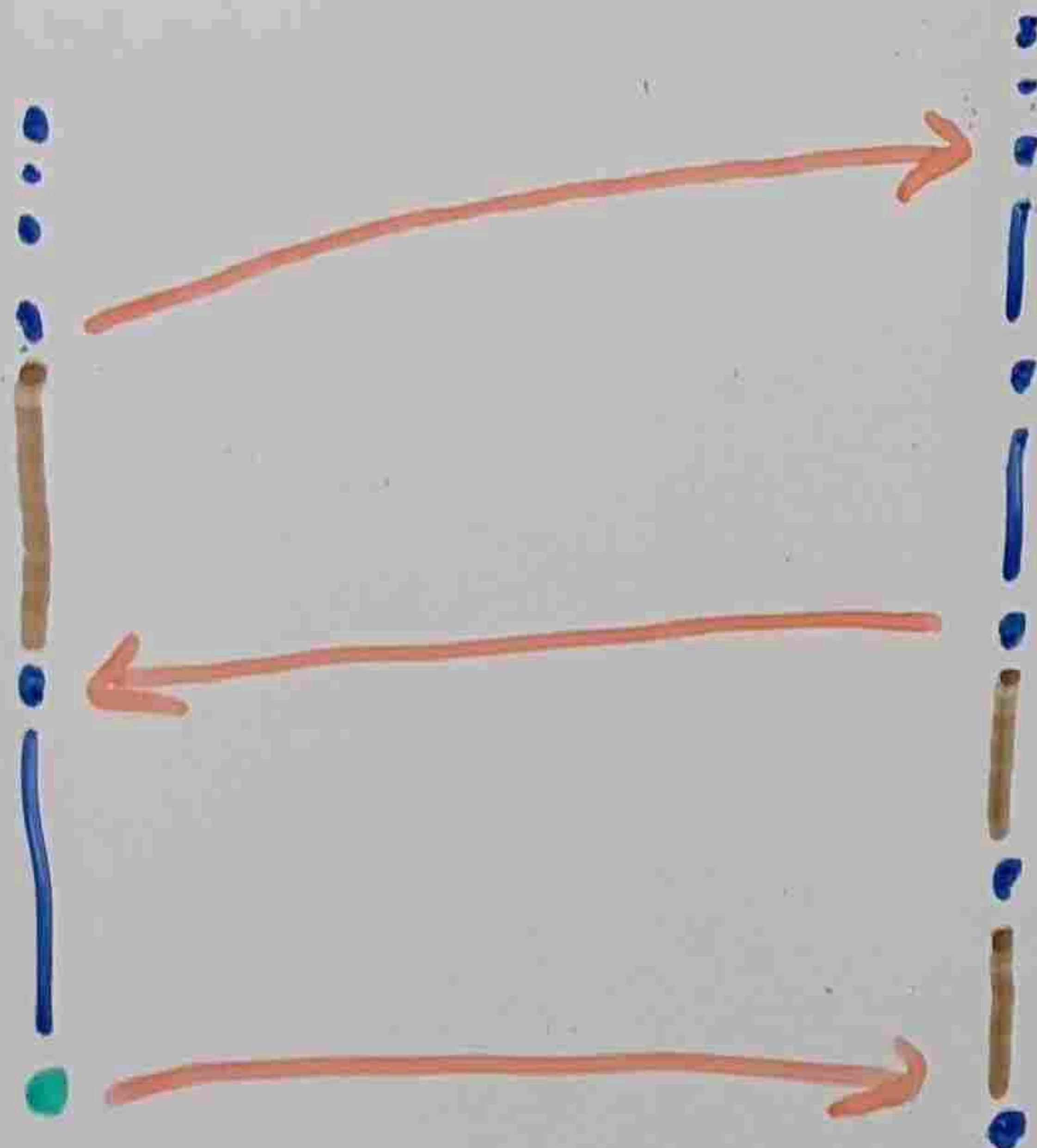
LIKE DEDUCTIONS BUT
 BETWEEN DIFFERENT TYPES
 ONE TO ONE
 WITH EXTRA
 BIDIRECTIONALITY
 MONOTONICITY

$$L: A \rightarrow B$$

$$R: B \rightarrow A$$

$$a \leq_A R(L(a))$$

$$b \leq_B L(R(b))$$



THE FLOW

BUILD

TYPE INSTANCES

CELL STRUCTURE

CONNECTIONS

POLICY SELECTION

EXECUTION

THE FLOW

BUILD

TYPE INSTANCES

CELL STRUCTURE

CONNECTIONS

POLICY SELECTION

RUN POLICY

EXECUTION

THE FLOW

BUILD

TYPE INSTANCES

CELL STRUCTURE

CONNECTIONS

POLICY SELECTION

RUN POLICY

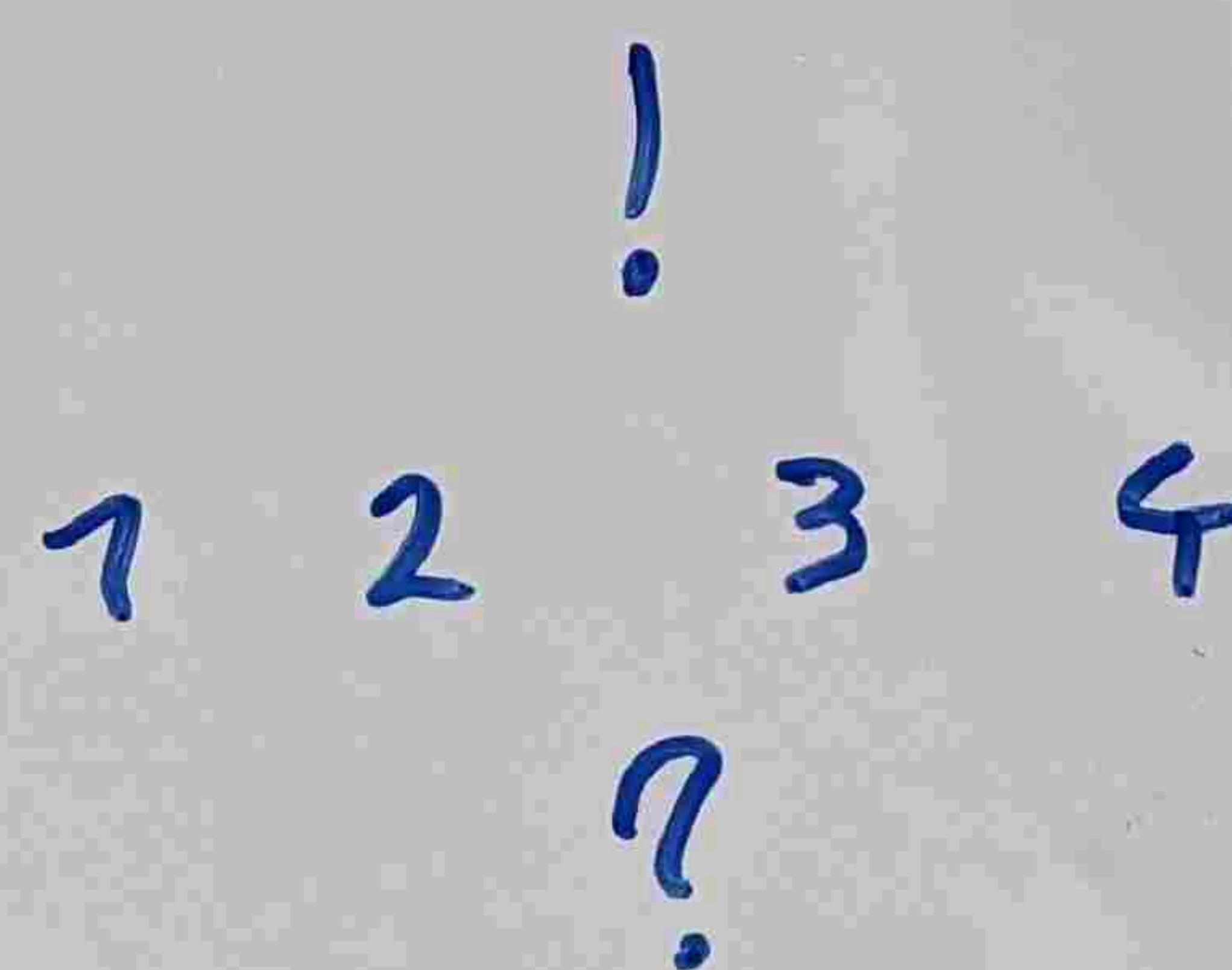
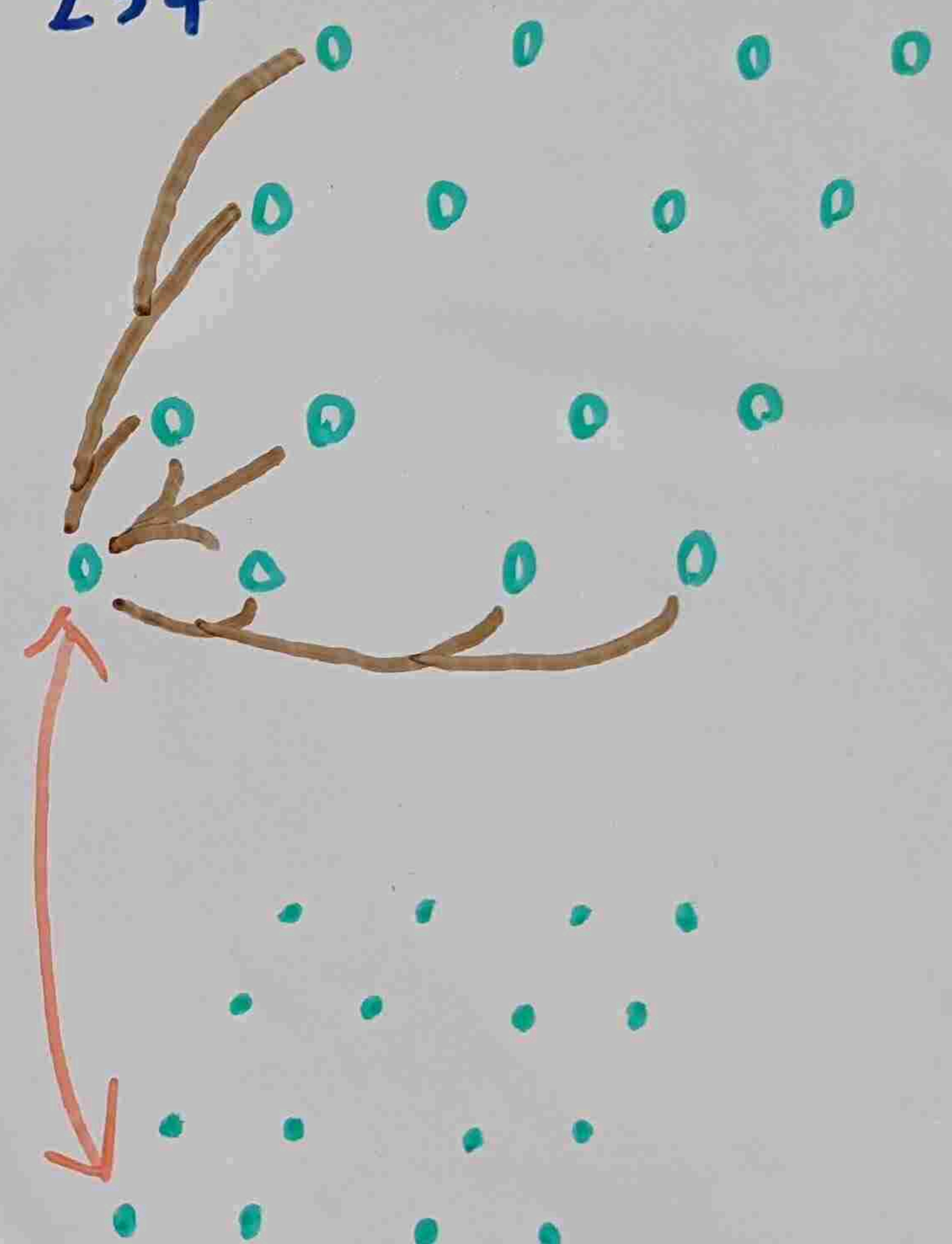
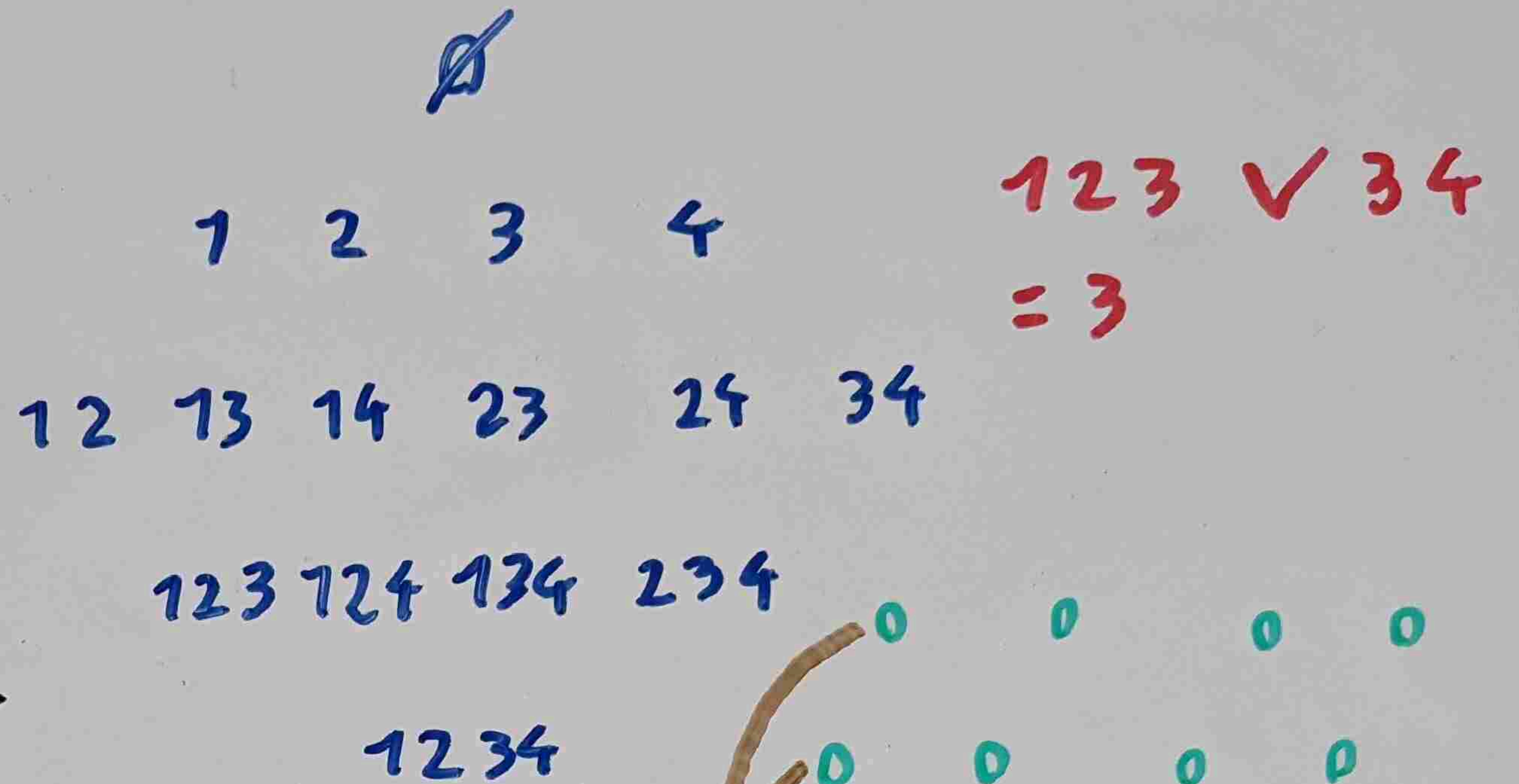
(READ-OUT)

END OF

THE FLOW

BUILD
 TYPE INSTANCES
 CELL STRUCTURE
 CONNECTIONS
 POLICY SELECTION
 RUN POLICY
 (READ-OUT)

INPUT
 PROPAGATION



? ✓ 2 = 2

EVALUATION

POLICY EXTENSION

NATIVE

BUDGET

EXECUTIONS⁺

CELL UPDATES[‡]

RUNNING TIME[‡]

FIXED POINT

SEARCH

METRIC

BACKTRACK

⋮

POLICY EXTENSION

NATIVE

BUDGET

EXECUTIONS[†]

CELL UPDATES[‡]

RUNNING TIME[‡]

FIXED POINT

SEARCH

METRIC

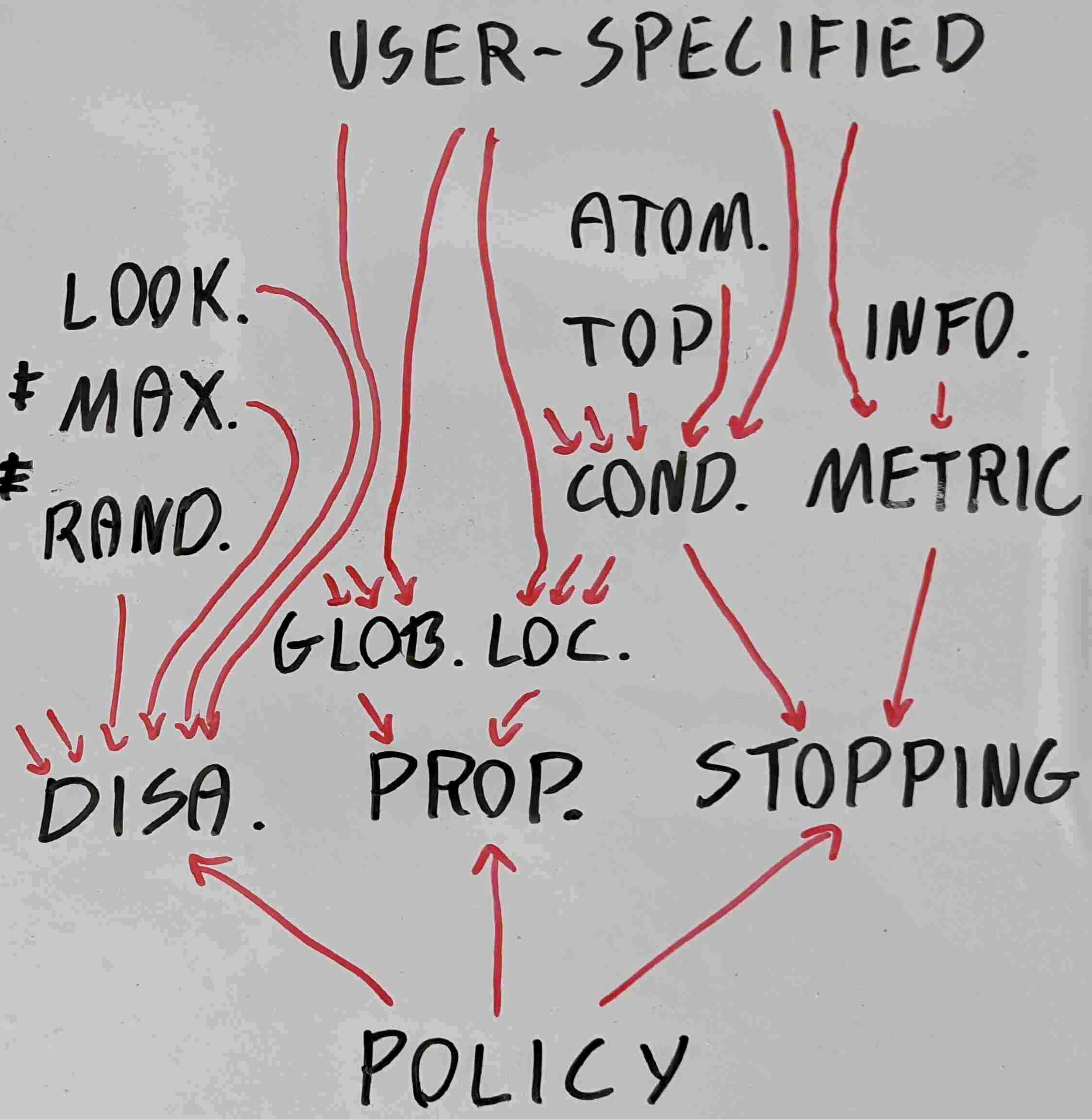
BACKTRACK

⋮

COMPOSITE

POLICY EXTENSION

NATIVE
 BUDGET
 EXECUTIONS⁺
 CELL UPDATES[‡]
 RUNNING TIME[‡]
 FIXED POINT
 SEARCH
 METRIC
 BACKTRACK
 :
 COMPOSITE



N&T/INDUCTION

ADAMV.BE

TEST IT OUT!

N&TIN/SLITION

ADAMV.BE/IP

TEST IT OUT!

THANK YOU!

WHAT IT IS

SYMBOLIC

"

"

SUB-SYMBOLIC DATA

"

"

RUNTIME

SPECIFICATION

HUMAN
CONSTRUCTED
PRE

MACHINE (LANGUAGE)

META (SYSTEM)

LIVE (COMPUTE)

SOLVER
MYOPIC
ONE WORLD

AGENT
PLANNING

IRREALIS WORLDS

KERAS.10 GEN.DEV NEO4) ATOMSPACE I.P.

WHAT IT IS

SYMBOLIC

"

"

SUB-SYMBOLIC DATA

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"

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KERAS.IO

GEN.DEV

NEO4J

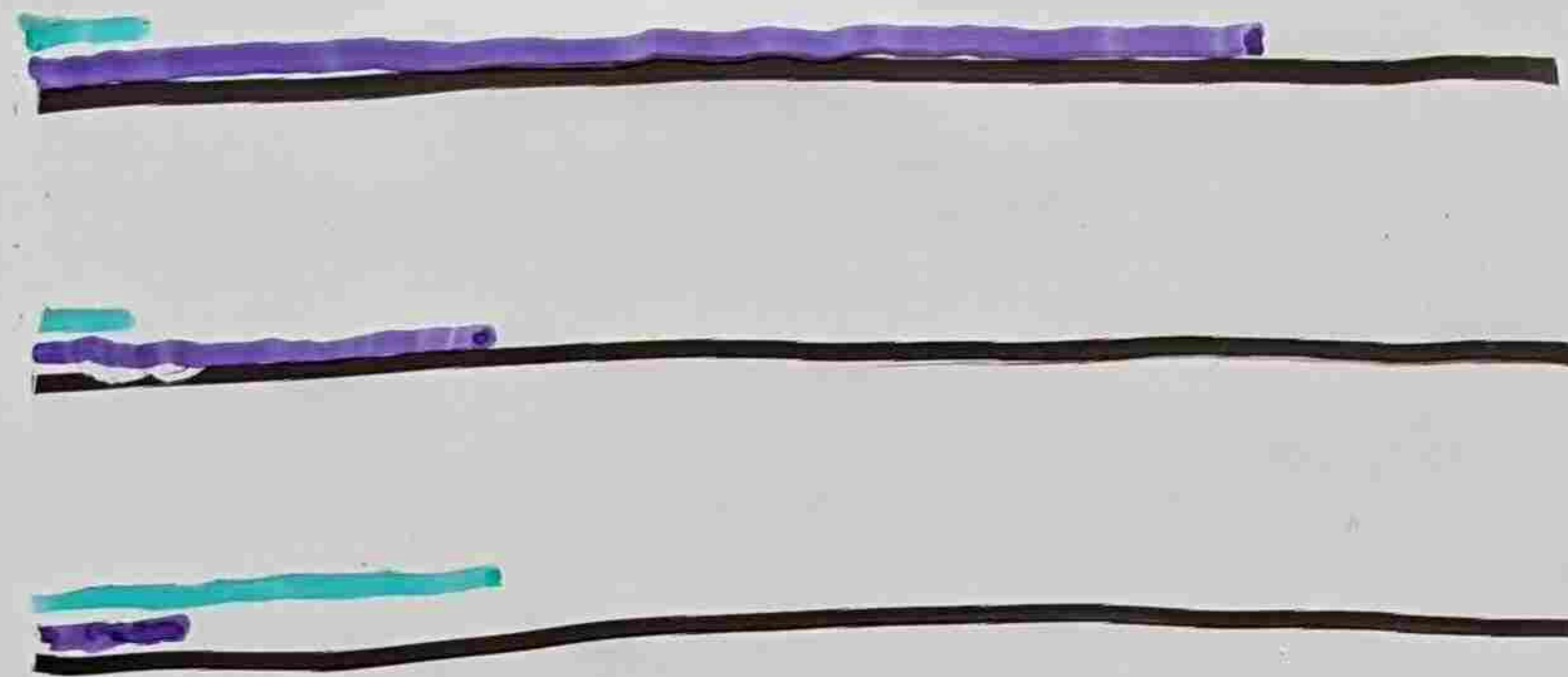
ATOMSPACE I.P.

WHAT IT IS

SYMBOLIC

"

"



SUB-SYMBOLIC DATA

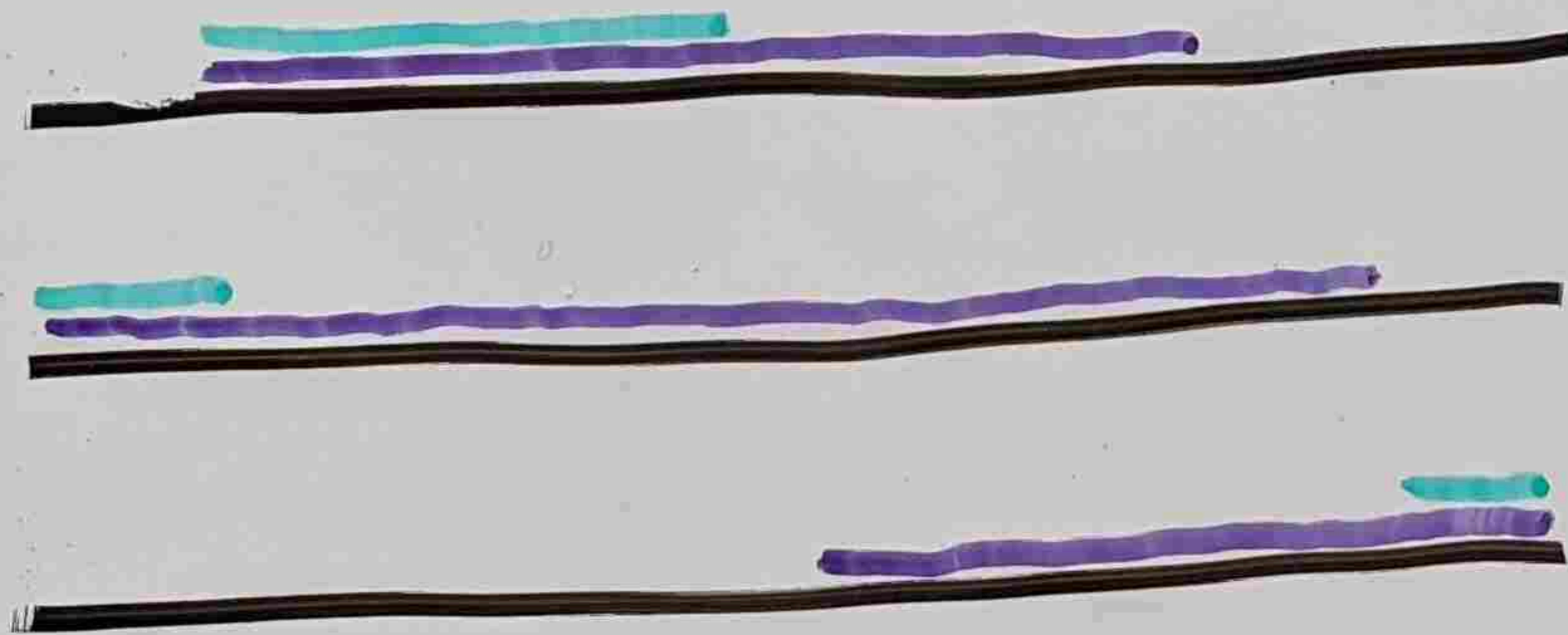
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"

RUNTIME

SPECIFICATION

HUMAN
CONSTRUCTED
PRE



MACHINE (LANGUAGE)

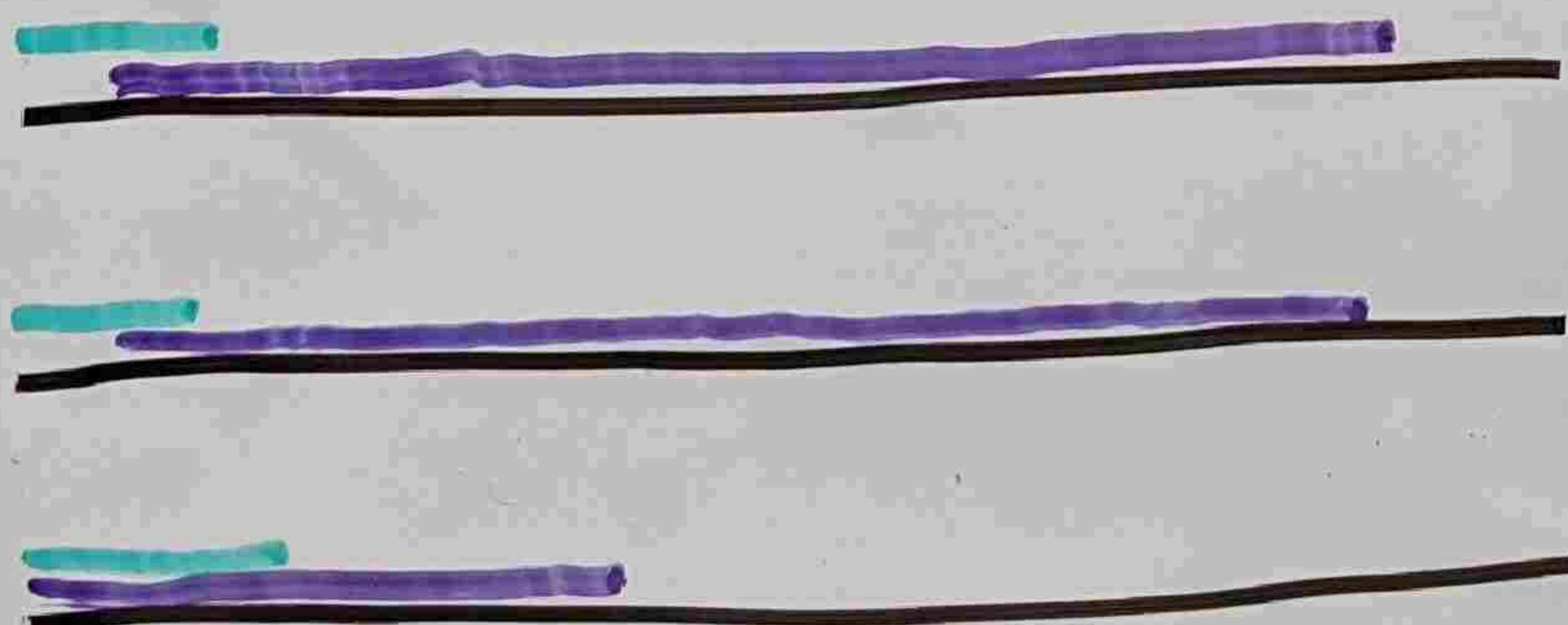
META (SYSTEM)

LIVE (COMPUTE)

SOLVER

MYOPIC

ONE WORLD



AGENT

PLANNING

IRREALIS WORLDS

KERAS.IO

GEN.DEV

NEO4J

ATOMSPACE I.P.

WHAT IT IS

SYMBOLIC

"

"



SUB-SYMBOLIC DATA

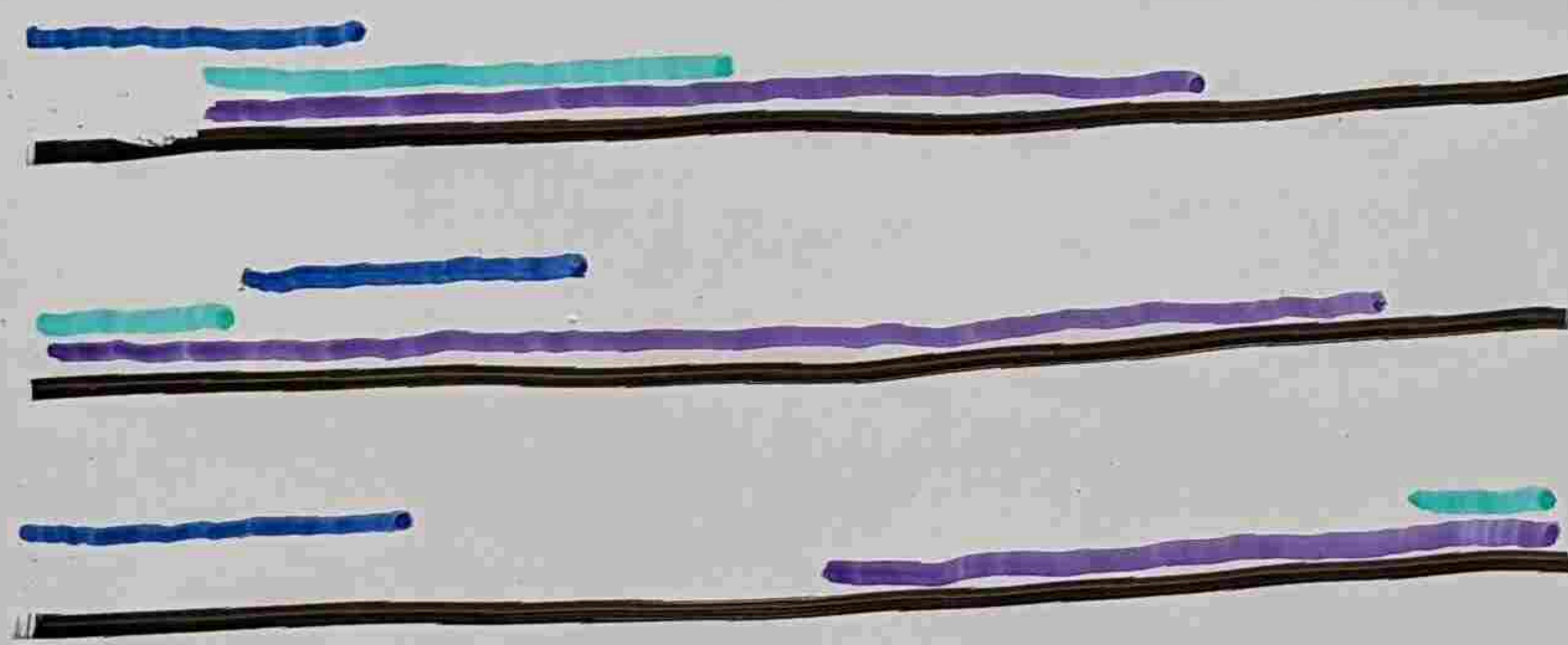
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"

RUNTIME

SPECIFICATION

HUMAN
CONSTRUCTED
PRE



MACHINE (LANGUAGE)

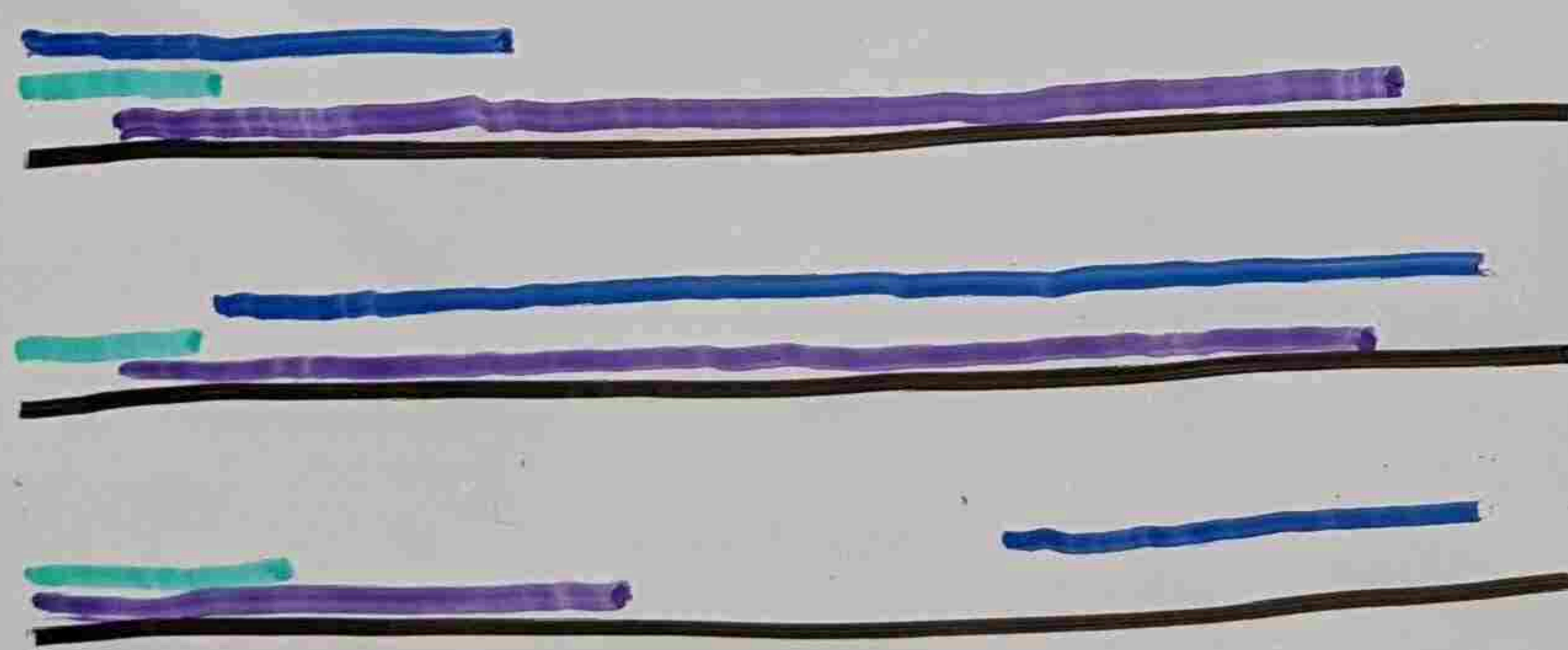
META (SYSTEM)

LIVE (COMPUTE)

SOLVER

MYOPIC

ONE WORLD



AGENT

PLANNING

IRREALIS WORLDS

KERAS.10

GEN.DEV

NEO4J

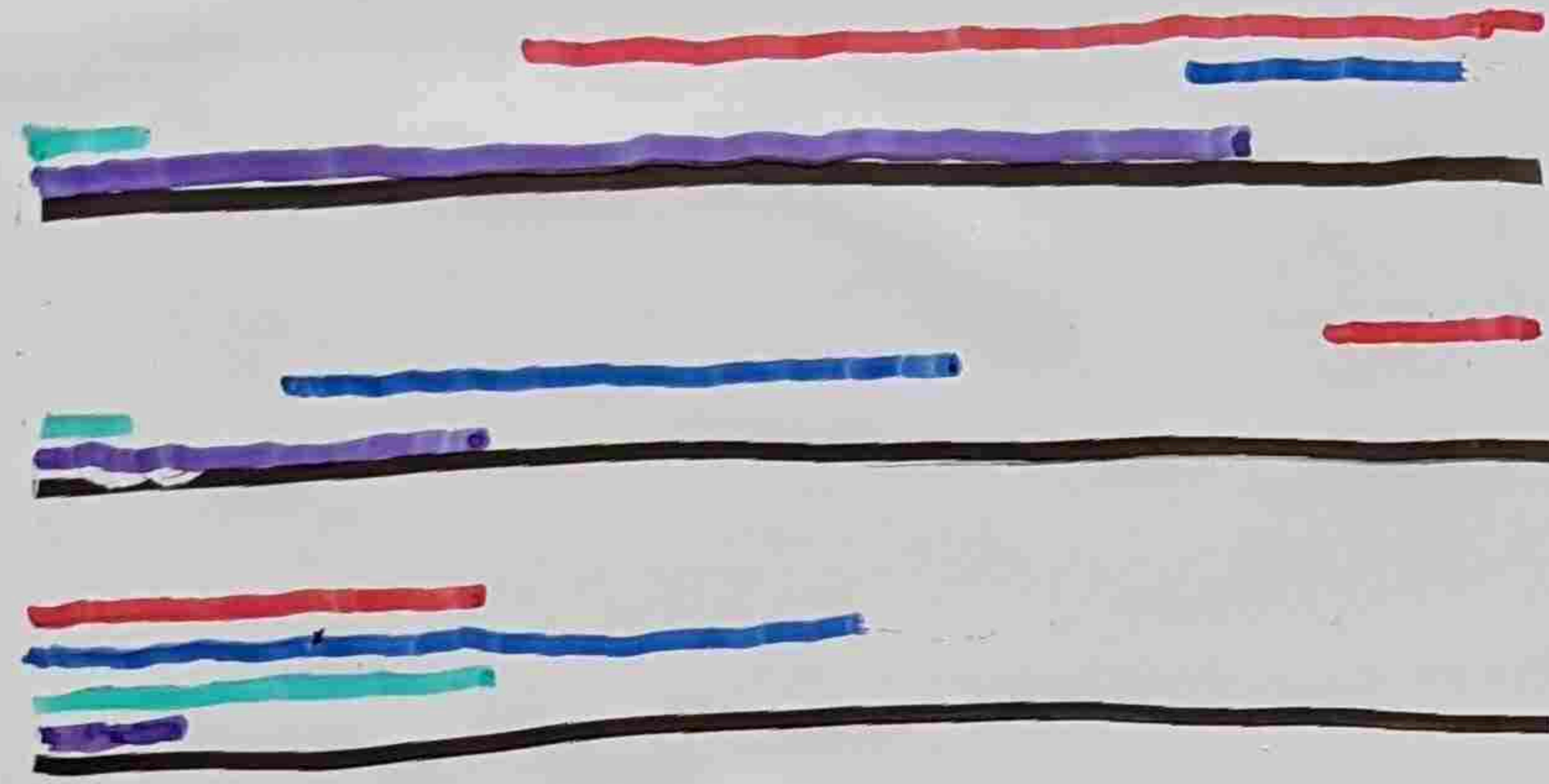
ATOMSPACE I.P.

WHAT IT IS

SYMBOLIC

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SUB-SYMBOLIC DATA

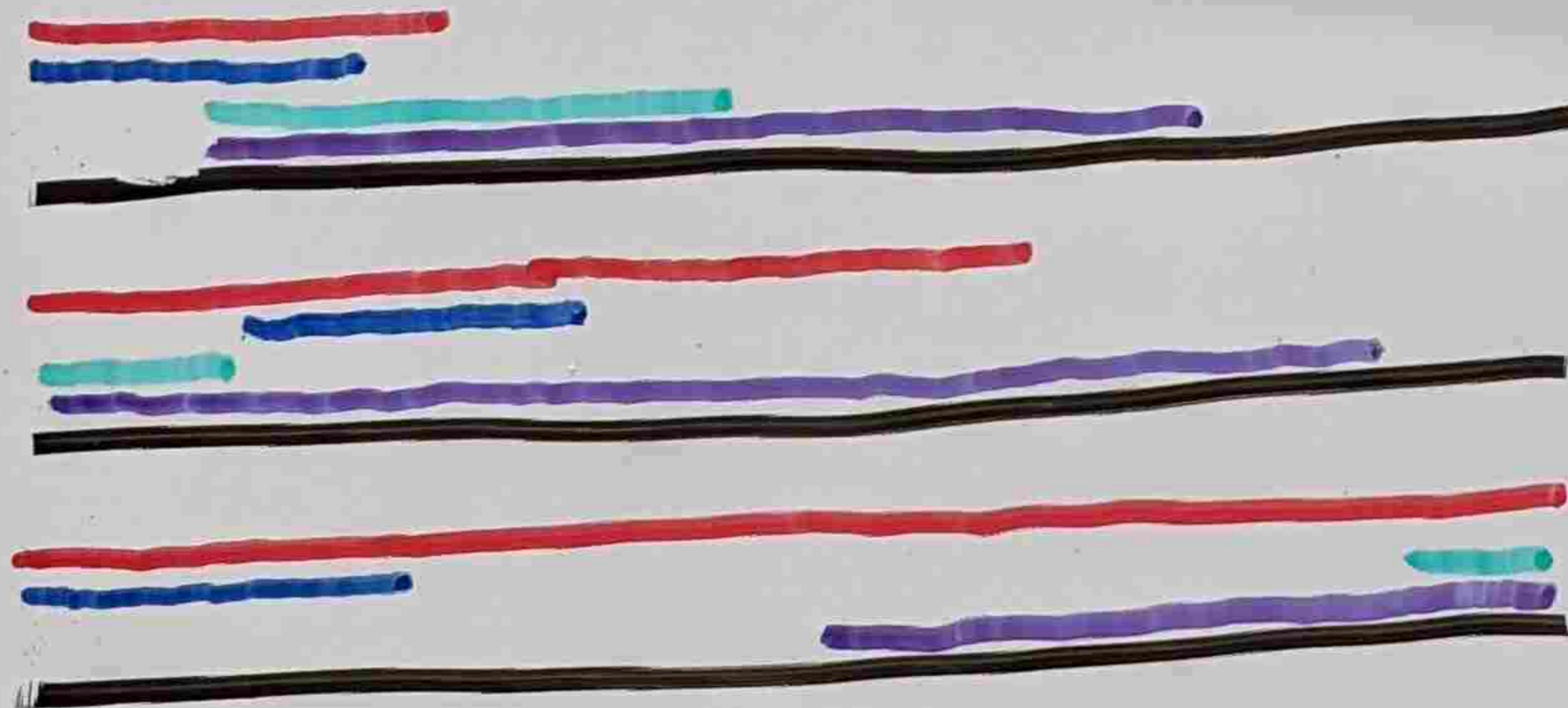
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"

RUNTIME

SPECIFICATION

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CONSTRUCTED
PRE



MACHINE (LANGUAGE)

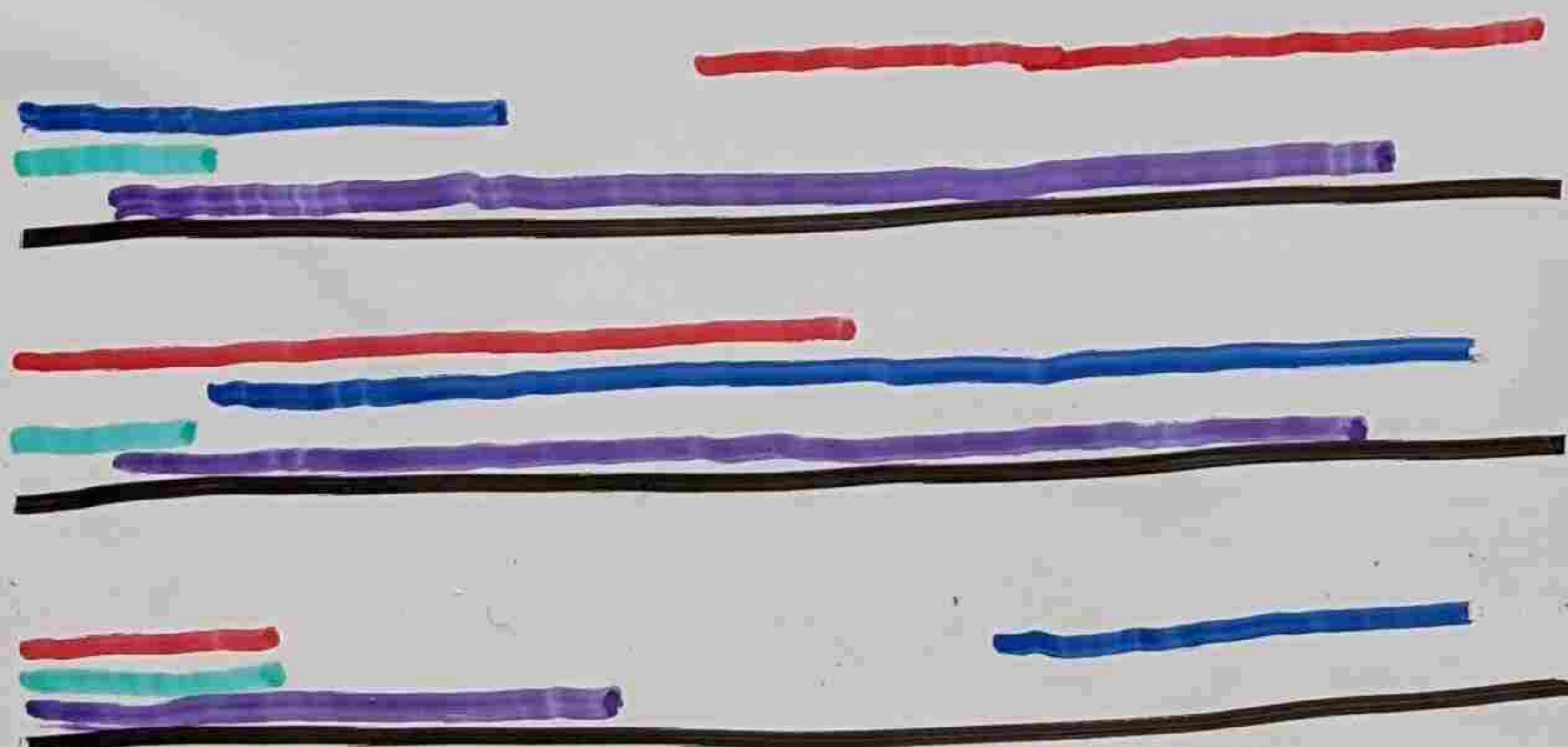
META (SYSTEM)

LIVE (COMPUTE)

SOLVER

MYOPIC

ONE WORLD



AGENT
PLANNING

IRREALIS WORLDS

KERAS.10

GEN.DEV

NEO4J

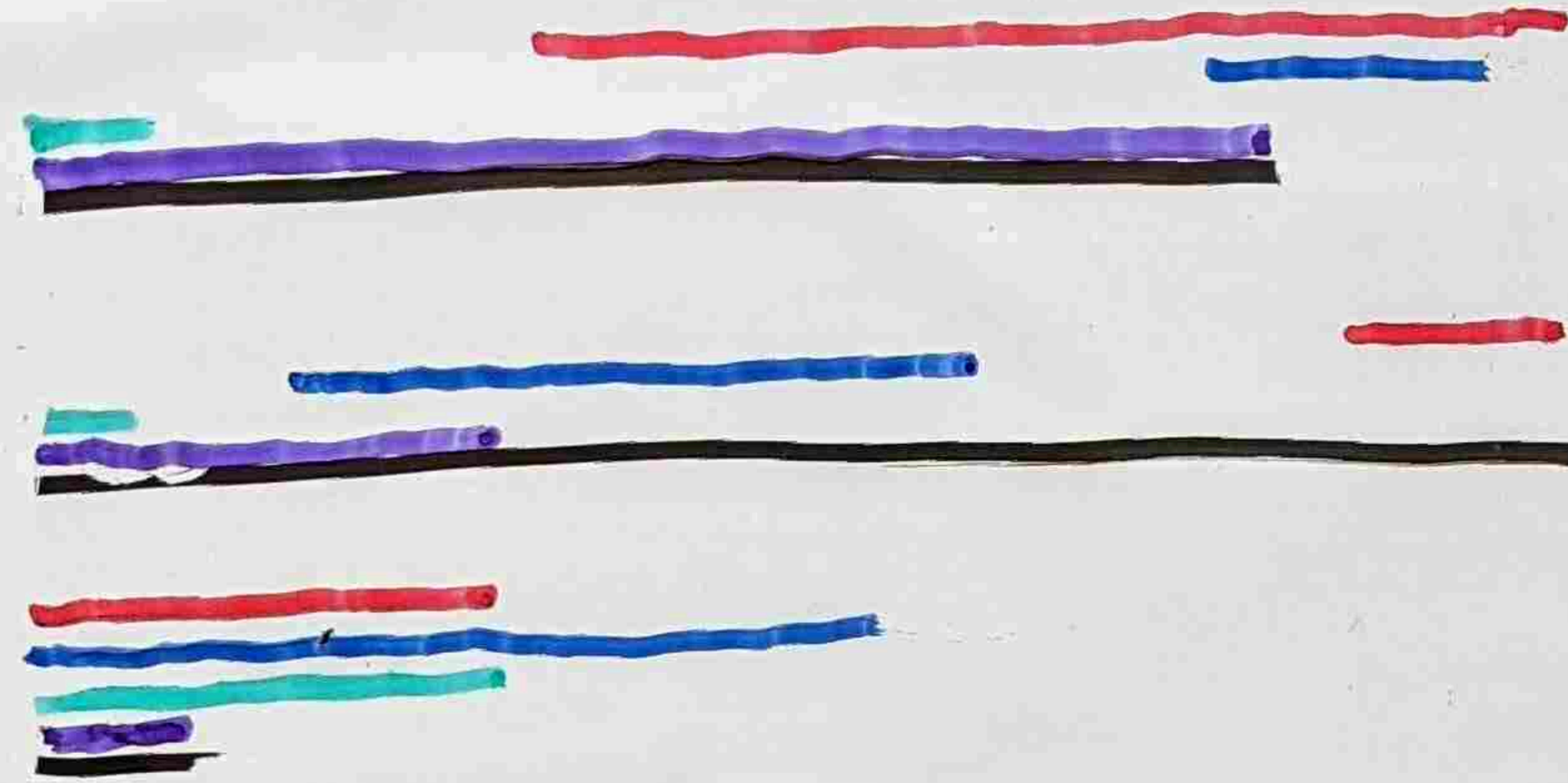
ATOMSPACE I.P.

WHAT IT IS

SYMBOLIC

"

"



SUB-SYMBOLIC DATA

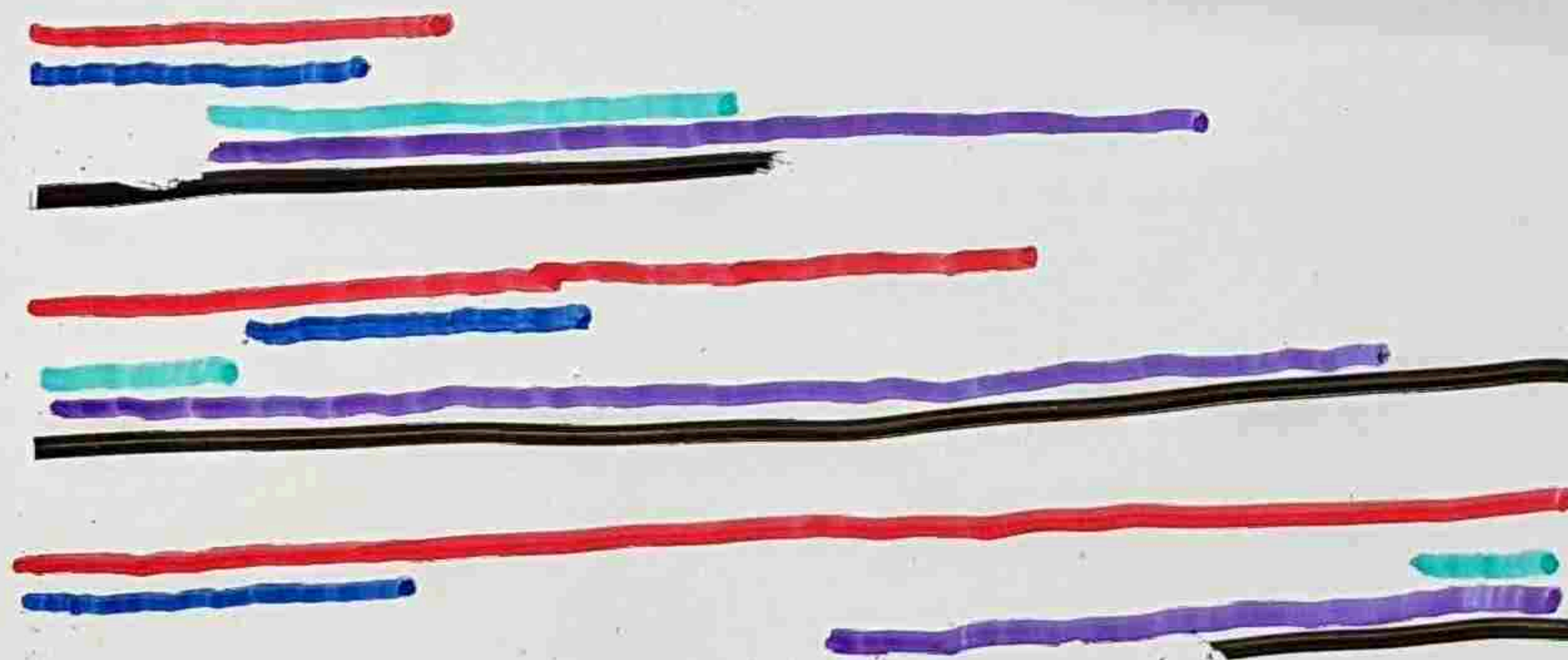
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"

RUNTIME

SPECIFICATION

HUMAN
CONSTRUCTED
PRE

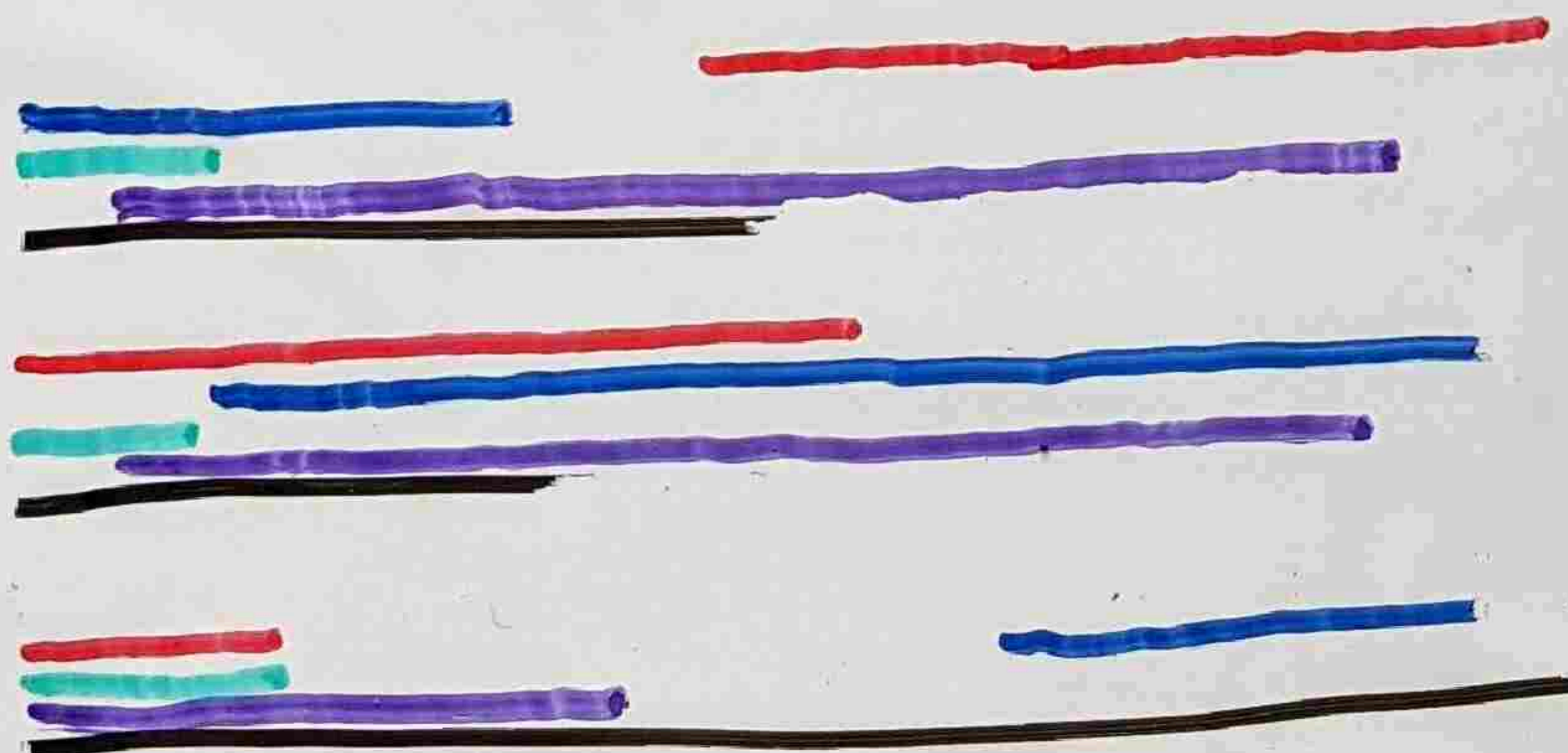


MACHINE (LANGUAGE)
META (SYSTEM)
LIVE (COMPUTE)

SOLVER

MYOPIC

ONE WORLD



AGENT
PLANNING

IRREALIS WORLDS

KERAS.10 GEN.DEV NEO4) ATOMSPACE I.P.