

Practice Predicates

Language, Representation and Interpretation

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1 Predicate No. 290e

Well Formed Expression $\forall X(\text{student?}(X) \rightarrow \exists Y(\text{book?}(Y) \wedge \text{has_read?}(X, Y)))$

Interpretation in Natural Language Every student has read some book.

2 Predicate No. d9e2

Well Formed Expression $\forall \text{Feature}(\exists \text{Library}(\text{depends_on?}(\text{Feature}, \text{Library})) \rightarrow (\neg \text{compatible_with?}(\text{Feature}, \text{Library}) \wedge \text{deprecated?}(\text{Library})))$

Interpretation in Natural Language Every feature depends upon some incompatible and deprecated library.

3 Predicate No. 4f1g

Well Formed Expression $\exists \text{TranscriptionFactor} \exists \text{ActivatorProtein} \forall \text{TargetGene}((\text{transcription_factor_activates?}(\text{ActivatorProtein}, \text{TargetGene})) \wedge \neg \text{co_located?}(\text{TranscriptionFactor}, \text{TargetGene}))$

Interpretation in Natural Language A protein may activate all genes that aren't co-located with a specific transcription factor.

4 Predicate No. 3d4e

Well Formed Expression $\exists Fluid \exists Pipe (\neg \text{incompressible?}(Fluid) \wedge \text{flows_through?}(Fluid, Pipe) \rightarrow \text{pressure_drop?}(Pipe))$

Interpretation in Natural Language If a compressible fluid flows through a pipe, then the pipe experiences pressure drop.

5 Predicate No. 9i0j

Well Formed Expression $\exists Gene \exists Protein \forall DNARegion ((\text{inhibits_proliferation?}(Gene) \wedge \text{binds_to?}(Protein, DNARegion)) \rightarrow \neg \text{regulates_binding?}(Gene, Protein, DNARegion))$

Interpretation in Natural Language A gene that stops cell growth and a protein exist where the gene never regulates the protein binding to DNA.

6 Predicate No. 6q7r

Well Formed Expression $\forall System \forall VibrationDamper \forall StandardComponent (\text{vibration_sensitive?}(System) \wedge \text{vibration_damper?}(VibrationDamper) \wedge \neg \text{replaced_by?}(StandardComponent, VibrationDamper))$

Interpretation in Natural Language In a vibration-sensitive system, a vibration damper is used without replacing any standard component.

7 Predicate No. 9j0k

Well Formed Expression $\exists Reactor \forall Condition (\neg \text{cstr?}(Reactor) \vee (\text{high_pressure?}(Condition) \rightarrow \text{suitable_for?}(Reactor, Condition)))$

Interpretation in Natural Language A reactor exists that either isn't a continuous stirred-tank reactor (CSTR), or is suitable for all high pressure conditions.

8 Predicate No. 2e3f

Well Formed Expression $\forall Protein (\neg \text{membrane_bound_receptor?}(Protein) \vee \exists Molecule (\text{interacts_with?}(Protein, Molecule) \wedge \neg \text{signaling_molecule?}(Molecule)))$

Interpretation in Natural Language Every protein is either not a membrane-bound receptor, or it interacts with a molecule that is not a signaling molecule.

9 Predicate No. f3a9

Well Formed Expression $\forall Course \exists Module (\neg \text{mandatory?}(Course) \vee (\text{advanced?}(Module) \rightarrow \neg \text{requires?}(Course, Module)))$

Interpretation in Natural Language Either a course is optional, or it doesn't require advanced modules.

10 Predicate No. 6d7e

Well Formed Expression $\exists GrowthProtein \forall Receptor (\text{receptor?}(Receptor) \rightarrow (\text{growth_protein?}(GrowthProtein) \vee \neg \text{inhibits?}(GrowthProtein, Receptor)))$

Interpretation in Natural Language A protein involved in cell growth exists that does not inhibit any receptor protein.

11 Predicate No. 1b2c

Well Formed Expression $\exists Process \forall Material (\neg \text{corrosive?}(Material) \wedge (\text{high_temperature?}(Process) \rightarrow \text{compatible?}(Process, Material)))$

Interpretation in Natural Language A high-temperature process exists that is compatible with all non-corrosive materials.

12 Predicate No. 2b91

Well Formed Expression $\exists PortCity \exists ExportCountry \forall DestinationCity (\text{major_port?}(PortCity) \wedge \text{located_in?}(PortCity, ExportCountry) \wedge \text{exports_to?}(ExportCountry, DestinationCity) \wedge \neg \text{located_in?}(DestinationCity, ExportCountry))$

Interpretation in Natural Language A country with a major port may ship to any city outside its borders.

13 Predicate No. 112m

Well Formed Expression $\exists Reaction \forall Product \forall Impurity (high_yield?(Reaction) \rightarrow (\neg contains_impurity?(Product, Impurity) \wedge produces?(Reaction, Product)))$

Interpretation in Natural Language Some high-yield reaction produces products that contain no impurities.

14 Predicate No. 8h9i

Well Formed Expression $\forall Protein \exists NLS (\neg nuclear_protein?(Protein) \vee (nls?(NLS) \rightarrow \neg contains_nls?(Protein, NLS)))$

Interpretation in Natural Language All proteins either aren't nuclear, or they don't have a nuclear signal.

15 Predicate No. 8a9b

Well Formed Expression $\exists Drug \exists Target \forall Inhibitor (therapeutic_effect?(Drug, Target) \wedge (known_inhibitor?(Inhibitor) \rightarrow \neg inhibited_by?(Target, Inhibitor)))$

Interpretation in Natural Language A drug works with a target that isn't blocked by any known inhibitor.

16 Predicate No. 4e5f

Well Formed Expression $\forall Fluid1 \forall Fluid2 (\neg miscible?(Fluid1, Fluid2) \rightarrow (liquid?(Fluid1) \vee gas?(Fluid2)))$

Interpretation in Natural Language If two fluids don't mix, then one is a liquid, and the other is a gas.

17 Predicate No. 7h8i

Well Formed Expression $\exists Reaction \exists Inhibitor (first_order_reaction?(Reaction) \wedge \neg catalyst?(Inhibitor) \rightarrow inhibited_by?(Reaction, Inhibitor))$

Interpretation in Natural Language Some first-order reaction is inhibited by a non-catalyst compound.

18 Predicate No. d93a

Well Formed Expression $\forall X \exists Y (\neg \text{man?}(X) \vee (\text{word?}(Y) \rightarrow \text{do_honour?}(X, Y)))$

Interpretation in Natural Language Either you are not a man enough or youd honour your word.

19 Predicate No. b8d3

Well Formed Expression $\forall X \forall Y (\text{likes?}(X, Y) \rightarrow \exists Z (\text{knows?}(X, Z) \wedge \text{vouch?}(Z, Y)))$

Interpretation in Natural Language If someone likes another, they know someone who'd vouch for them.

20 Predicate No. 2w3x

Well Formed Expression $\forall \text{Component} \forall \text{Condition} (\text{precision_machined?}(\text{Component}) \wedge \neg \text{high_temperature?}(\text{Condition}) \rightarrow \text{suitable_for?}(\text{Component}, \text{Condition}))$

Interpretation in Natural Language All precision-machined components are suitable for non-high-temperature operating conditions.

21 Predicate No. 5c8d

Well Formed Expression $\forall \text{Protein} \exists \text{Ligand} (\neg \text{signaling_protein?}(\text{Protein}) \vee (\text{ligand?}(\text{Ligand}) \rightarrow \text{binds_to?}(\text{Protein}, \text{Ligand})))$

Interpretation in Natural Language Every protein either isn't a signaling protein, or it binds to some ligand.

22 Predicate No. 4o5p

Well Formed Expression $\forall \text{Material} \forall \text{Process} (\text{ductile?}(\text{Material}) \wedge \neg \text{casting_process?}(\text{Process}) \rightarrow \text{suitable_for?}(\text{Material}, \text{Process}))$

Interpretation in Natural Language All ductile materials are suitable for any non-casting manufacturing process.

23 Predicate No. 7d6f

Well Formed Expression $\exists City \forall Destination (\text{tourist_destination?}(Destination) \rightarrow (\text{coastal_city?}(City) \vee \neg \text{more_popular?}(City, Destination)))$

Interpretation in Natural Language There is a city that is either a coastal city, or it's less popular than all tourist destinations.

24 Predicate No. c4b2

Well Formed Expression $\exists X \forall Y \forall Z (\text{teacher?}(X) \wedge \text{student_subject?}(Y, Z) \rightarrow \text{teaches?}(X, Y, Z))$

Interpretation in Natural Language There is a teacher who teaches every student every subject.

25 Predicate No. 5f6g

Well Formed Expression $\exists Reaction \forall Product \forall Inhibitor (\text{produces?}(Reaction, Product) \wedge \neg \text{inhibited_by?}(Product, Inhibitor))$

Interpretation in Natural Language A reaction exists where all products it makes are not inhibited by any inhibitor.

26 Predicate No. 2m3n

Well Formed Expression $\forall Machine (\neg \text{precision_instrument?}(Machine) \vee \exists Component (\text{high_strength_alloy?}(Component) \wedge \text{uses?}(Machine, Component)))$

Interpretation in Natural Language All machines either aren't precision instruments, or they use a high-strength alloy component.

27 Predicate No. 1b4c

Well Formed Expression $\forall Restaurant(\text{popular?}(Restaurant) \rightarrow \exists Dish(\text{vegetarian?}(Dish) \wedge \text{serves?}(Restaurant, Dish)))$

Interpretation in Natural Language Every popular restaurant serves at least one vegetarian dish.

28 Predicate No. 8s9t

Well Formed Expression $\forall Machine \exists Component(\neg \text{requires_maintenance?}(Machine, Component) \vee (\text{high_wear?}(Component) \rightarrow \text{high_maintenance_frequency?}(Machine)))$

Interpretation in Natural Language Every machine either has a component it rarely maintains, or it needs frequent maintenance due to some high-wear component.

29 Predicate No. 3n4o

Well Formed Expression $\forall Component \exists AssemblyStation \exists Tool(\text{compatible?}(Tool, Component) \wedge \text{uses_tool?}(AssemblyStation, Tool, Component))$

Interpretation in Natural Language All components are controlled by an assembly station through a compatible tool.

30 Predicate No. 0u1v

Well Formed Expression $\forall QualityControlSystem \exists CriticalDefect \forall Sensor(\text{automated?}(QualityControlSystem) \wedge (\text{critical?}(CriticalDefect) \wedge \neg \text{detects?}(Sensor, CriticalDefect)))$

Interpretation in Natural Language Automated quality control systems have blind spots for critical defects.