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Paper into to logic

Question 1

What syllogism its types in detail ?

Syllogism

in logic, a valid deductive argument having two premises and a conclusion. The traditional type is the categorical syllogism in which both premises and the conclusion are simple declarative statements that are constructed using only three simple terms between them, each term appearing twice (as a subject and as a predicate): “All men are mortal; no gods are mortal; therefore no men are gods.” The argument in such syllogisms is valid by virtue of the fact that it would not be possible to assert the premises and to deny the conclusion without contradicting oneself.

Forexamples

All men are mortal.
Socrates is a man.
Therefore, Socrates is mortal.

Types of syllogism

Conditional Syllogism

The basic form of the conditional syllogism is: If A is true then B is also true. (If A then B). It appears through a major premise, a minor premise and a conclusion.

Example:

You are sad.

I am qualified to help people who are sad.

I can make you happy.

Categorical Syllogism

The basic form of the categorical syllogism is: If A is part of C then B is a part of C. (A and B are members of C).

Example:

All New Yorkers are happy.

Some people live in New York.

Some people are happy.

Disjunctive Syllogism

The basic form of the disjunctive syllogism is: Either A is true or B is true. (A exclusive-or B). Thus, if A is true, B is false, and if B is true, A is false. A and B cannot both by true.

Example:

Either you vote for me or you vote for disaster.

The Rules of the Syllogism

There must be three terms.

The middle term must be distributed at least once.

No term may be distributed in the conclusion, if it was not distributed in the premise.

No conclusion may be drawn from two particular premises nor from two negative premises.
If one of the premises is negative, the conclusion must be negative.
These rules concern the validity of a syllogism, but NOT its truth. Truth is determined by whether or not we agree with the premises.

Question 2

What is symbolic logic ? draw truth tables for negative conjunction and disjunction.

Symbolic logic

Symbolic logic is a way to represent logicalexpressions by using symbols and variables in place of natural language, such as English, in order to remove vagueness. Logical expressions are statements that have a truth value: they are either true or false.

Tables of negative conjunction

p	q	p.q
T	T	T
T	F	F
F	T	F
F	F	F

Tables of disjunction

p	q	p.q
T	T	T
T	F	T
F	T	T
F	F	F

Question 3

Explain truth and validity separately with examples?

Truth

Logical truth is one of the most fundamental concepts in logic. Broadly speaking, a logical truth is a statement which is true regardless of the truth or falsity of its constituent propositions. In other words, a logical truth is a statement which is not only true, but one which is true under all interpretations of its logical components (other than its logical constants). Thus, logical truths such as "if p, then p" can be considered tautologies. Logical truths are thought to be the simplest case of statements which are analytically true (or in other words, true by definition). All of philosophical logic can be thought of

as providing accounts of the nature of logical truth, as well as logical consequence.

Logical truths are generally considered to be necessarily true. This is to say that they are such that no situation could arise in which they could fail to be true. The view that logical statements are necessarily true is sometimes treated as equivalent to saying that logical truths are true in all possible worlds. However, the question of whether any statements are *necessarily* true remains the subject of continued debate

Examples

Suppose you're picking out a new couch, and your significant other says "get a sectional *or* something with a chaise."
This is a complex statement made of two simpler conditions: "is a sectional," and "has a chaise." For simplicity, let's use *S* to designate "is a sectional," and *C* to designate "has a chaise." The condition *S* is true if the couch is a sectional.
A truth table for this would look like this:

S	*C*	*S* or *C*
T	T	T
T	F	T

S	*C*	*S* or *C*
F	T	T
F	F	F

In the table, T is used for true, and F for false. In the first row, if *S* is true and *C* is also true, then the complex statement "*S* or *C*" is true. This would be a sectional that also has a chaise, which meets our desire.
Remember also that *or* in logic is not exclusive; if the couch has both features, it does meet the condition

Validity

In logic, the property of an argument consisting in the fact that the truth of the premises logically guarantees the truth of the conclusion. Whenever the premises are true, the conclusion must be true, because of the form of the argument. Some arguments that fail to be valid are acceptable on grounds other than formal logic (e.g., inductively strong arguments), and their conclusions are supported with less than logical necessity. Where the support yields high probability of the conclusion relative to the premises, such arguments are sometimes called inductively valid. In other purportedly persuasive arguments, the premises actually provide no rational grounds for accepting the

conclusion; such defective forms of argument are called fallacies

Examples

Anyone who lives in the city Honolulu, HI also lives on the island of Oahu.

Kanoe does not live on the island of Oahu.

Therefore, Kanoe does not live in the city Honolulu, HI

Question 4

Casual reasoning is the cognition about cause and effect and not learning .discuss in detail?

Causal reasoning belongs to our most central cognitive competencies. Causal knowledge is used as the basis of predictions and diagnoses, categorization, action planning, decision making and problem solving. Whereas philosophers have analyzed causal reasoning for many centuries, psychologist have for a long time preferred to view causal reasoning and learning as special cases of domain-general competencies, such as logical reasoning or associative learning. The present chapter gives an overview of recent research about causal reasoning. It discusses competing theories, and contrasts domain-general accounts with theories that model causal reasoning and learning as attempts to make inferences about stable hidden causal processes. Causal relationships may be understood as a transfer

of force If A causes B, then A must transmit a force (or causal power) to B which results in the effect. Causal relationships suggest change over time; cause and effect are temporally related, and the cause precedes the outcome

Causality may also be inferred in the absence of a force, a less-typical definition.A cause can be removal (or stopping), like removing a support from a structure and causing a collapse or a lack of precipitation causing wilted plants.

Humans can reason about many topics (for example, in social and counterfactual situations and in the experimental sciences) with the aid of causal understanding Understanding depends on the ability to comprehend cause and effect. People must be able to reason about the causes of others' behavior (to understand their intentions and act appropriately) and understand the likely effects of their own actions. Counterfactual arguments are presented in many situations; humans are predisposed to think about "what might have been", even when that argument has no bearing on the current situation.

Cause-and-effect relationships define categories of objects. Wings are a feature of the category "birds"; this feature is causally interconnected with another feature of the category, the ability to fly

Traditionally, research in cognitive psychology has focused on causal relations when the cause and the effect are both binary values; both the cause and the effect are present or absent It is also possible that both the cause and the effect take continuous values. For example, turning the volume knob of a radio (as the cause) increases or decreases the sound intensity (as the effect). In these cases, the relation between the variables of the cause and the effect resembles a mathematical function in which change in the variable of the cause changes values in the variable of the effect. Human learning of such relations has been studied in the field of "Function Learning".

Even so, it is well understood that physical applications of continuous mathematical models are not literally continuous in practice. A knob on a radio does not take on an uncountably infinite number of possible values -- it takes a finite number of possible values fully limited by the mechanical, physical, nature of the knob itself. There exists no one-to-one mapping between the continuous mathematics used for engineering applications and the physical product(s) produced by the engineering. Indeed, this is one of the core open problems within Philosophy of Mathematics. While this is one of the most prominent open problems in the philosophy of mathematics, one possible answer to this open question is that reality is rasterized (possibly at the Planck Scale, see Loop Quantum Gravity) and is

fundamentally discrete. So goes the theory of mathematical fictionalism, where continuous mathematics serves as a fake or fictional construct of imagery used for reasoning geometrically via drawings and intuitive ideas of shapes absent of measurement data. Indeed, some historical thinkers, such as Gauss, suspected that physical reality was in fact inherently non-euclidean and so developed non-euclidean geometries which were then used by Albert Einstein in his general theory of relativity with gravity being explained as the force or property which makes reality non-euclidean, which also implies a certain non-existence of continuous mathematics in the real world given that euclidean geometry is required to derive the existence of irrational numbers.

Cause and effect may also be understood probabilistically, via inferential statistics. A common example taught in introductory logic is a conditional statement such that that 'the ground is wet.' Often the specific example is presented as a statement, 'If it rained, then the ground is wet' or something along this line. And often the fact that such a conditional statement is in fact true even when the antecedent (that it rained) is false generates some controversy.

This fact about the conditional, the controversial (for some) law of excluded middle, hinges on reasoning about cause and effect. You might think, for instance, that the fact that it rained is what caused the ground to

be wet, if it rained and the ground is wet. But it could well be that it rained after the ground was already wet, or any other possible cause of the observed effect.

These other possible causes are called 'hidden variables.' Hidden variables always cause conditional statements to take a 'true' truth value in situations where both its antecedent is false and its conclusion true. Consequently, it follows that any logic conditional with a true conclusion is always true regardless of whether or not its antecedent is true. And any logic conditional takes a false value only when its conclusion is false. This shouldn't be surprising.

In inferential statistics, there exists a mantra 'correlation does not equal causation.' Just because rain and wet grounds do have a positive correlation (they tend to happen together), without more information it would be impossible to know whether or not it was in fact the rain which caused the ground to become wet, so the positive correlation is insufficient for causation. A dump truck could well have come by and dumped out a truckload of water onto the ground, or a man could have dropped his water, or any number of other possible antecedents could be responsible for causing the conclusion that the ground is in fact wet to be true.

In this way, ascertaining cause and effect relations is quite hard and arguably impossible barring some

variable uncertain degree of confidence in some specific possible cause in relation to all other uncontrolled for potentially equally or unequally probable but still possible causes (some non-100% degree of confidence, known as a confidence interval in inferential statistics). Incidentally, this problem of hidden variables forms the foundation for the scientific method -- which is a solution to this problem of hidden variables. Only via the scientific method can one be absolutely sure that some true antecedent causes a conclusion to also be true. We say a cause causes an effect if and only if there exists a 100% perfect correlation (positive or negative) between the cause and the effect when and only when all other possible variables are controlled for (a 100% degree of confidence). In these cases these effects are called dependent variables, and causes are called independent variables (so named because the dependent variable(s) depend on the independent variable(s), and the independent variable(s) do not depend on any other variable).

Indeed, when possible hidden variables cannot be controlled for, such as is the case of quantum physics, causality is indeterminate (quantum indeterminacy). This constitutes one of the biggest open problems in physics today, the interpretation of quantum physics and its reconciliation with the causal

structure of special relativity (Einstein-Podolsky-Rosen paradox, Rietdijk–Putnam argument).

Theories of causality also play important roles in debates of both free will and determinism. The empirical observations predicted by special relativity suggest that anything that could happen, already has happened. Depending on your philosophy of mathematics, since special relativity is a continuous mathematical model, the experimental confirmation of predicted effects described by the possibly fictional and conceptually-reliable-and-informative theory have implications for an ontology of time, which touches on the metaphysics of time which is intimately tied up with notions of causality and reasoning about cause and effect.

And the (for now) indeterminism of quantum physics suggests the possibility of free will in a deterministic reality. To quote Hameroff, "quantum state reductions seem to involve temporal non-locality, able to refer quantum information both forward and backward in what we perceive as time, enabling real-time conscious causal action. Quantum brain biology and Orch OR can thus rescue free will" (Orchestrated Objective Reduction).

Question 5

Discuss analogical thinking .discuss its guidelines and significance?

Analogical thinking

The world-renowned writer and philosopher, Edward de Bono [6], creator of the term lateral thinking", says that the analogy technique for generating ideas is a means to get some movement going, to start a train of thought. The challenge for us, when presented with a difficult problem, is that we can become hemmed in by traditional habitual thinking. Thinking laterally through the use of analogy helps to bring about a shift away from this habitual thinking.

In his book, Lateral Thinking [7], first published almost fifty years ago, de Bono suggests that lateral thinking, of which thinking by analogy is an aspect, is the opposite of traditional vertical thinking. Although he also says that both lateral thinking and vertical thinking can work together rather than in opposition.

Thinking by analogy helps to bring about creativity and insight and is a system of thought that can be learned. The analogy is a simple story that becomes an analogy when it is compared to the current problematic condition. The story employed must have a process that can we can follow, that we can easily understand and apply to the present circumstance. For example, you might criticise a tradesperson for creating such a mess in your home, and he may suggest that to make an omelette he has to break some eggs

Guidelines

Analogical thinking is one of the most effective tools to generate innovative ideas. It enables us to develop new ideas by transferring information from well-known domains and utilizing them in a novel domain. However, using analogical thinking does not always yield appropriate ideas, and there is a lack of consensus among researchers regarding the evaluation methods for assessing new ideas. Here, we define the appropriateness of generated ideas as having high structural and low superficial similarities with their source ideas. This study investigates the relationship between thinking process and the appropriateness of ideas generated through analogical thinking. We conducted four workshops with 22 students in order to collect the data. All generated ideas were assessed based on the definition of appropriateness in this study. The results show that participants who deliberate more before reaching the creative leap stage and those who are engaged in more trial and error for deciding the final domain of a new idea have a greater possibility of generating appropriate ideas. The findings suggest new strategies of designing workshops to enhance the appropriateness of new ideas.

Significance

Analogical reasoning is suggested as a useful new mechanism for the manipulation and derivation of some kinds of deep knowledge. The starting-point for the suggestion is the observation that experts often express parts of their non-shallow knowledge in terms of ‘cases’ and reason by trying to identify relevant similarities between past cases and a current problem. We describe case-based reasoning as a particular form of analogical reasoning, and set both types of reasoning within a new seven-stage model. An example of reasoning applied to similarities between a case of heart disease and the malfunctioning of a shower system is given and explained.