Many Problem

Many-body problem

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Assignment problem

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The assignment problem is a fundamental combinatorial optimization problem. In its most general form, the problem is as follows:

The problem instance has a number of agents and a number of tasks. Any agent can be assigned to perform any task, incurring some cost that may vary depending on the agent-task assignment. It is required to perform as many tasks as possible by assigning at most one agent to each task and at most one task to each agent, in such a way that the total cost of the assignment is minimized.

Alternatively, describing the problem using graph theory:

The assignment problem consists of finding, in a weighted bipartite graph, a matching of maximum size, in which the sum of weights of the edges is minimum.

If the numbers of agents and tasks are equal, then the problem is called...

Problem solving

consultants are largely problem solvers for issues that require technical skills and knowledge beyond general competence. Many businesses have found profitable

Problem solving is the process of achieving a goal by overcoming obstacles, a frequent part of most activities. Problems in need of solutions range from simple personal tasks (e.g. how to turn on an appliance) to complex issues in business and technical fields. The former is an example of simple problem solving (SPS) addressing one issue, whereas the latter is complex problem solving (CPS) with multiple interrelated obstacles. Another classification of problem-solving tasks is into well-defined problems with specific obstacles and goals, and ill-defined problems in which the current situation is troublesome but it is not clear what kind of resolution to aim for. Similarly, one may distinguish formal or fact-based problems requiring psychometric intelligence, versus socio-emotional problems...

N-body problem

In physics, the n-body problem is the problem of predicting the individual motions of a group of celestial objects interacting with each other gravitationally

In physics, the n-body problem is the problem of predicting the individual motions of a group of celestial objects interacting with each other gravitationally. Solving this problem has been motivated by the desire to understand the motions of the Sun, Moon, planets, and visible stars. In the 20th century, understanding the

dynamics of globular cluster star systems became an important n-body problem. The n-body problem in general relativity is considerably more difficult to solve due to additional factors like time and space distortions.

The classical physical problem can be informally stated as the following:

Given the quasi-steady orbital properties (instantaneous position, velocity and time) of a group of celestial bodies, predict their interactive forces; and consequently, predict their...

Travelling salesman problem

The problem was first formulated in 1930 and is one of the most intensively studied problems in optimization. It is used as a benchmark for many optimization

In the theory of computational complexity, the travelling salesman problem (TSP) asks the following question: "Given a list of cities and the distances between each pair of cities, what is the shortest possible route that visits each city exactly once and returns to the origin city?" It is an NP-hard problem in combinatorial optimization, important in theoretical computer science and operations research.

The travelling purchaser problem, the vehicle routing problem and the ring star problem are three generalizations of TSP.

The decision version of the TSP (where given a length L, the task is to decide whether the graph has a tour whose length is at most L) belongs to the class of NP-complete problems. Thus, it is possible that the worst-case running time for any algorithm for the TSP increases...

Problem of evil

omnipotent, omniscient, and a wholly good god. Concerning the evidential problem, many theodicies have been proposed. One accepted theodicy is to appeal to

The problem of evil also known as the problem of suffering is the philosophical question of how to reconcile the existence of evil and suffering with an omnipotent, omnibenevolent, and omniscient God. There are currently differing definitions of these concepts. The best known presentation of the problem is attributed to the Greek philosopher Epicurus.

Besides the philosophy of religion, the problem of evil is also important to the fields of theology and ethics. There are also many discussions of evil and associated problems in other philosophical fields, such as secular ethics and evolutionary ethics. But as usually understood, the problem of evil is posed in a theological context.

Responses to the problem of evil have traditionally been in three types: refutations, defenses, and theodicies...

Decision problem

decision problem is a computational problem that can be posed as a yes—no question on a set of input values. An example of a decision problem is deciding

In computability theory and computational complexity theory, a decision problem is a computational problem that can be posed as a yes—no question on a set of input values. An example of a decision problem is deciding whether a given natural number is prime. Another example is the problem, "given two numbers x and y, does x evenly divide y?"

A decision procedure for a decision problem is an algorithmic method that answers the yes-no question on all inputs, and a decision problem is called decidable if there is a decision procedure for it. For example, the decision problem "given two numbers x and y, does x evenly divide y?" is decidable since there is a decision procedure called long division that gives the steps for determining whether x evenly divides y and the correct answer, YES or NO,...

Problem of universals

The problem of universals is an ancient question from metaphysics that has inspired a range of philosophical topics and disputes: "Should the properties

The problem of universals is an ancient question from metaphysics that has inspired a range of philosophical topics and disputes: "Should the properties an object has in common with other objects, such as color and shape, be considered to exist beyond those objects? And if a property exists separately from objects, what is the nature of that existence?"

The problem of universals relates to various inquiries closely related to metaphysics, logic, and epistemology, as far back as Plato and Aristotle, in efforts to define the mental connections humans make when understanding a property such as shape or color to be the same in nonidentical objects.

Universals are qualities or relations found in two or more entities. As an example, if all cup holders are circular in some way, circularity may be...

Undecidable problem

theory and computational complexity theory, an undecidable problem is a decision problem for which it is proved to be impossible to construct an algorithm

In computability theory and computational complexity theory, an undecidable problem is a decision problem for which it is proved to be impossible to construct an algorithm that always leads to a correct yes-or-no answer. The halting problem is an example: it can be proven that there is no algorithm that correctly determines whether an arbitrary program eventually halts when run.

Open problem

these supposed open problems were " solved" by means of showing that they were not well-defined. In mathematics, many open problems are concerned with the

In science and mathematics, an open problem or an open question is a known problem which can be accurately stated, and which is assumed to have an objective and verifiable solution, but which has not yet been solved (i.e., no solution for it is known).

In the history of science, some of these supposed open problems were "solved" by means of showing that they were not well-defined.

In mathematics, many open problems are concerned with the question of whether a certain definition is or is not consistent.

Two notable examples in mathematics that have been solved and closed by researchers in the late twentieth century are Fermat's Last Theorem and the four-color theorem. An important open mathematics problem solved in the early 21st century is the Poincaré conjecture.

Open problems exist in all...

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