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Software design pattern

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In software engineering, a software design pattern or design pattern is a general, reusable solution to a commonly occurring problem in many contexts in software design. A design pattern is not a rigid structure to be transplanted directly into source code. Rather, it is a description or a template for solving a particular type of problem that can be deployed in many different situations. Design patterns can be viewed as formalized best practices that the programmer may use to solve common problems when designing a software application or system.

Object-oriented design patterns typically show relationships and interactions between classes or objects, without specifying the final application classes or objects that are involved. Patterns that imply mutable state may be unsuited for functional...

Object-oriented programming

William (2008). "1.6: Object-Oriented Programming". Java Software Solutions. Foundations of Programming Design (6th ed.). Pearson Education Inc. ISBN 978-0-321-53205-3

Object-oriented programming (OOP) is a programming paradigm based on the object – a software entity that encapsulates data and function(s). An OOP computer program consists of objects that interact with one another. A programming language that provides OOP features is classified as an OOP language but as the set of features that contribute to OOP is contended, classifying a language as OOP and the degree to which it supports or is OOP, are debatable. As paradigms are not mutually exclusive, a language can be multi-paradigm; can be categorized as more than only OOP.

Sometimes, objects represent real-world things and processes in digital form. For example, a graphics program may have objects such as circle, square, and menu. An online shopping system might have objects such as shopping cart,...

Aspect-oriented programming

Software Development, annual conference on AOP AspectJ Programming Guide The AspectBench Compiler for AspectJ, another Java implementation Series of IBM

In computing, aspect-oriented programming (AOP) is a programming paradigm that aims to increase modularity by allowing the separation of cross-cutting concerns. It does so by adding behavior to existing code (an advice) without modifying the code, instead separately specifying which code is modified via a "pointcut" specification, such as "log all function calls when the function's name begins with 'set'". This allows behaviors that are not central to the business logic (such as logging) to be added to a program without cluttering the code of core functions.

AOP includes programming methods and tools that support the modularization of concerns at the level of the source code, while aspect-oriented software development refers to a whole engineering discipline.

Aspect-oriented programming entails...

Code review

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Code review (sometimes referred to as peer review) is a software quality assurance activity in which one or more people examine the source code of a computer program, either after implementation or during the development process. The persons performing the checking, excluding the author, are called "reviewers". At least one reviewer must not be the code's author.

Code review differs from related software quality assurance techniques like static code analysis, self-checks, testing, and pair programming. Static analysis relies primarily on automated tools, self-checks involve only the author, testing requires code execution, and pair programming is performed continuously during development rather than as a separate step.

Prolog

quicksort(Bigger). A design pattern is a general reusable solution to a commonly occurring problem in software design. Some design patterns in Prolog are

Prolog is a logic programming language that has its origins in artificial intelligence, automated theorem proving, and computational linguistics.

Prolog has its roots in first-order logic, a formal logic. Unlike many other programming languages, Prolog is intended primarily as a declarative programming language: the program is a set of facts and rules, which define relations. A computation is initiated by running a query over the program.

Prolog was one of the first logic programming languages and remains the most popular such language today, with several free and commercial implementations available. The language has been used for theorem proving, expert systems, term rewriting, type systems, and automated planning, as well as its original intended field of use, natural language processing...

Structured program theorem

whether to adopt structured programming for software development, partly because the construction was more likely to obscure a program than to improve it. On

The structured program theorem, also called the Böhm–Jacopini theorem, is a result in programming language theory. It states that a class of control-flow graphs (historically called flowcharts in this context) can compute any computable function if it combines subprograms in only three specific ways (control structures). These are

Executing one subprogram, and then another subprogram (sequence)

Executing one of two subprograms according to the value of a boolean expression (selection)

Repeatedly executing a subprogram as long as a boolean expression is true (iteration)

The structured chart subject to these constraints, particularly the loop constraint implying a single exit (as described later in this article), may however use additional variables in the form of bits (stored in an extra integer...

Glossary of computer science

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This glossary of computer science is a list of definitions of terms and concepts used in computer science, its sub-disciplines, and related fields,

including terms relevant to software, data science, and computer programming.

Expression problem

power of programming language designs. The expression problem is also a fundamental problem in multi-dimensional Software Product Line design and in

The expression problem is a challenging problem in programming languages that concerns the extensibility and modularity of statically typed data abstractions. The goal is to define a data abstraction that is extensible both in its representations and its behaviors, where one can add new representations and new behaviors to the data abstraction, without recompiling existing code, and while retaining static type safety (e.g., no casts). The statement of the problem exposes deficiencies in programming paradigms and programming languages. Philip Wadler, one of the co-authors of Haskell, has originated the term.

Linear programming

distinct optimal solutions; for example, the problem of finding a feasible solution to a system of linear inequalities is a linear programming problem in which

Linear programming (LP), also called linear optimization, is a method to achieve the best outcome (such as maximum profit or lowest cost) in a mathematical model whose requirements and objective are represented by linear relationships. Linear programming is a special case of mathematical programming (also known as mathematical optimization).

More formally, linear programming is a technique for the optimization of a linear objective function, subject to linear equality and linear inequality constraints. Its feasible region is a convex polytope, which is a set defined as the intersection of finitely many half spaces, each of which is defined by a linear inequality. Its objective function is a real-valued affine (linear) function defined on this polytope. A linear programming algorithm finds a...

OCaml

of automated theorem proving, and is used in static analysis and formal methods software. Beyond these areas, it has found use in systems programming

OCaml (oh-KAM-əl, formerly Objective Caml) is a general-purpose, high-level, multi-paradigm programming language which extends the Caml dialect of ML with object-oriented features. OCaml was created in 1996 by Xavier Leroy, Jérôme Vouillon, Damien Doligez, Didier Rémy, Ascánder Suárez, and others.

The OCaml toolchain includes an interactive top-level interpreter, a bytecode compiler, an optimizing native code compiler, a reversible debugger, and a package manager (OPAM) together with a composable build system for OCaml (Dune). OCaml was initially developed in the context of automated theorem proving, and is used in static analysis and formal methods software. Beyond these areas, it has found use in systems programming, web development, and specific financial utilities, among other application...