Formal aspects of language

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What are the characteristics of formal language. Slang includes the formal aspects of a language. Formal and lexical aspects of language. Aspects of formal and informal language. Formal language aspects of cellular automata.

Adjectives and adverbs Adverbs Adverbs Adverbs Adverbs Adverbs phrases Adverbs and adverbs phrases: position Adverbs and adverb phrases: typical errors Adverbs: shapes Adverbs: functions Adverbs: types Comparison: adverbs (worse, more easily) Graduate course Adverbs of the time Adverbs as speech markers (in any case, finally)) Adverbs as short answers (in the end, of course) Use of adjectives and adverbs Easily confused words Above or below? On the other side, beyond or through? Advice or advice? Affects or effects? All or all? All or whole? Allow, allow or leave? Almost or almost? Lonely or lonely? Together or together? Again or again? Also, or even? Alternate (ly,) alternative (ly) Even if or anyway? Generally or all together? Amount, number or quantity of? More or more? Someone, someone or something? Apart from or except for? Get up or get up? Around or around? Whisper or laugh? How or how? How, why or since? When or when? Is it gone or is it gone? Start or start? Beyond or later? Between or between? Born or born? Bring, take and take Can, could or could? Classic or classic? Are you coming or going? Consider or consider? Composite or composite? Content or content? Different from, different from or different from? Do or do? Down or down? During or for? All of them or all of them? East or East; North or North? Economic or economic? Efficient or effective? Older, older or older, older? End or end? Especially or especially? Except or except for? Wait, hope or wait? Experience or experiment? Fall or fall? Far away or are there many? Farther, farther or farther, farther? Fast, fast or fast? - Did you fall or hear? Female or female; male or male? Finally, at the end or at the end? Before, before or at the beginning? Dressed or dressed? Following or following? For or since? Forget or leave? Full or full? Funny or funny? Going or going? Grateful or grateful? Listen or listen (to?) High or high? Historical or historical? Home or home? What's... what's that? If or when? If or if? Are you coming or sick? Imply or infer? By the way or by the way? Is it or yours? Lately or lately? Lay or lie? Loan or loan? Less or less? Look, see or look? Short or short? Man, men or people? Maybe or maybe? Maybe or maybe? Closer or next? Never or never... ever? Handsome or funny? Definitely or definitely? No or no? Today, today or today? Open or open? Opportunity or possibility? In front or in front? Others, others, this one or that one? Out or out? Permission or permit? Person, persons or persons? Do you choose or do you pick up? Play or play? Politics, politics, politics or politics? Price or prize? Principal or principal? Silence or not? Get up or get up? Memories or memories? Right or right? Rob or steal? Say or say? So, or to do it? Sometimes or sometimes? Sound or noise? Is he talking or talking? What? Well, are they or are they? To or to? Wait or wait? Wake up, wake up or wake up? Values Is it worth it? Substantives, pronouns and andPronunciation Pronunciation of one another, the other All, all, all, everywhere it Genre Nobody, no one, nothing, no One and a pronunciation: Pernunciation: possessive (my, mine, your, your, etc.) Pronunciation: reflexive (I, himself, etc.) Pronunciation: indefinite (-body, -one, -thing, -where) Pronunciation: one, you, us, they pronounce relative Questions: questionable pronouns (what, who) Someone, someone, something, somewhere that quantifiers a bit everything is less, the minimum, at least less small, a little, few, a couple of batches, a lot, many more, most, most, many, many, a lot, many, a lot of, many: Quantiifiers No, none of Plenty Some and any word asks words as when where, who for what reason to use substantives Prepositions and particles Using English Collocation Functions Numbers Date Measures Number Time People and places Place and movement Foreign Away and far from Back Inside Nearby Outside Politeness Talking Sexual English Language Types of English Useful phrases Writing modules Verbi Ten and not... Neither, nor... and not... Denial: two negative negative clauses with any, anyone, anything, anywhere Negating in unfinished clauses Negative prefixes and suffix negative adverbs: Hardly, rarely, etc. Negation: emphasize the denial of thought, believe, suppose, hope Questions Sequence of words formed by specific rules This article covers a technical term in mathematics and computer science. For studies of natural languages, see formal semantics (linguistic). For formal modes of speech in natural languages, see Registry (sociolinguistic). Structure of syntactically well formed, though not sensitive, English phrase, "Green Ideas without colors sleep furiously" (Historical example of Chomsky 1957). In logic, mathematics, computer science and linguistics, a formal language consists of words whose letters are taken from an alphabet and are well formed according to a certain set of rules. The alphabet of a formal language consists of symbols, letters or tokens that concatenate in strings of the language. [1] Each string concatenated by symbols of this alphabet is called word, and words belonging to a particular formal language are sometimes called well-formed words or well-formed formulas. A formal language is often defined by means of a formal grammar such as a regular grammar or a grammar without context,consists of its rules of formation. The field of formal language theory studies mainly the purely syntactic aspects of such languages, i.e. their internal structural patterns. The theory of formal language is derived from linguistics, as a way of understanding the syntactic regularities of natural languages. In computer science, formal languages are used among others as a basis to define grammar of programming languages and formalized versions of subsets of natural languages in which language words represent concepts that are associated with particular or semantic meanings. In the theory of computational complexity, decision-making problems are typically defined as formal languages and the complexity classes are defined as the formal language sets that can be analyzed by machines with limited computational power. In the logic and foundations of mathematics, formal languages are used to represent the syntax of axiomatic systems, and mathematical formalism is the philosophy that all mathematics can be reduced to syntactic manipulation of formal languages in this way. History This section needs expansion. You can help by adding it. (March 2021) The first use of formal language is thought to be Begriffsschrift of Gottlob Frege of 1879, which means "concept write", which describes a "formal language, modeled on that of arithmetics, for pure thought". [2] Axel Thue's first semi-Thue system, which can be used to rewrite strings, was influential on formal grammar. Words on an alphabet An alphabet, in the context of formal languages, may be any set, although it often makes sense to use an alphabet in the usual sense of the word, or more generally a set of characters like ASCII or Unicode. The elements of an alphabet are called his letters. An alphabet may contain an infinite number of elements;[note 1] however, most definitions in the formal theory of specific language alphabets with a finite number of elements, and most results apply only to them. A word on an alphabet can be any finished sequence (i.e., string) of letters. The set of all words on an alphabet Σ is usually denoted by Σ* (using the star Kleene). The length of a word is the number of letters it is composed of. For any alphabet, there is only a word of length 0, the empty word, which is often denoted by and, ε, λ or even Λ. For concatenation you can combine two words to form a new word, whose length is the sum of the lengths of the original words. The result of concatering a word with the empty word is the original word. In some applications, especially in logic, the alphabet is also known as vocabulary and words are known as formulas or phrases; this breaks the letter / wordand replace it from a word/metaphor phrase. Definition A formal L language on an alphabet is a subset of Σ*, i.e. a set of words on that alphabet. Sometimes words are grouped into expressions, while rules and constraints can be formulated to createExpressions. In computer science and mathematics, which usually do not deal with natural languages, the adjective "formal" is often omitted as redundant. While the formal theory of language is usually concerned with formal languages which are described by some syntactic rules, the actual definition of the concept "formal language" is only as above: a (possibly infinite) set of finite-length strings composed by an alphabet, no more and no less. In practice, there are many languages that can be described by rules, such as regular languages or languages without context. The notion of formal grammar can be closer to the intuitive concept of a "language", a described by syntactic rules. With an abuse of definition, a particular formal language is often thought of as having a formal grammar describing it. Examples The following rules describe a formal L language above the alphabet Σ = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, +, =}: Each non-empty string that does not contain "+" or "=" and does not start with "0" is in L. The string "0" is in L. A string containing "=" is in L if and only if there is a valid string" and separates only two strings No string is in L other than those implied by previous rules. Under these rules, the string "23+4=555" is in L, but the string "=234=+" is not. This formal language expresses natural numbers, well-formed additions and well-formed additions, but expresses only what they seem (their syntax), not what they mean (semanti). For example, in none of these rules there is any indication that "0" means zero number, "+" means added, "23+4=555" is false, etc. For finite languages, all well-formed words can be explicitly enumerated. For example, we can describe a L language as only L = {a, b, ab, cba}. The degenerated case of this building is the empty language, which does not contain words at all (L = ∞). However, even on a finite alphabet (not empty) like Σ = {a, b} there are an infinite number of finite-length words that can potentially be expressed: "a", "abb", "ababba", "aababbaab", ... Therefore, formal languages are typically endless, and describing an infinite formal language is not as simple as writing L = {a, b, ab, cba}. Here are some examples of formal languages: L = Σ*, the set of all words on Σ; L = {a}* = {an}, where n extends on natural numbers and "an" means "a" repeated n times (this is the set of words that consists only of the symbol "a"); syntax set of syntax programs correlate in a given programming language (the syntax of which is usually defined by a set of grammarstrings, alphanumeric, ascii, characters, on, this, line, i, e.} formal languages are used as tools in multiple disciplines. However, the formal theory of language rarely cares about particular languages (excluding examples,) but mainly deals with the study of various types of formalities to describe languages. For example, a language can be given as those strings generated by some formal grammar; those strings described or matched by a particular regular expression; those strings accepted by a certain automaton, like a turing machine or a finished-state automaton; those strings for which a decision procedure (an algorithm that makes a sequence of related YES/NO questions) produces the yes answer. What is their expressive power? (can describe every language that formalism y can describe? can describe other languages?) what is their recognisability? (How difficult is it to decide if a given word belongs to a language described by formalism x?) what is their comparability? (how difficult it is to decide if two languages, one described in x formalism and one in y formalism, or in x again, are they actually the same language?.) surprisingly often, the answer to these decision problems is "can not be done at all," or "is extremely expensive" (with a characterization of how expensive.) therefore, formal language theory is an important area of application of computability theory and complexity theory. formal languages can be classified in the chomsky hierarchy based on the expressive power of their grammar and the complexity of their automaton. Unpretentious grammar and regular grammar provide a good compromise between expressiveness and ease of parsing, and are widely used in practical applications. language operations are common. This includes standard operations, such as union, intersection and complement. another working class is the element-sensitive application of string operations. examples: supponga l 1 {\displaystyle L_{1}} and l 2 {\displaystyle L_{2}} are languages on some common alphabets Σ {\displaystyle \sigma } . concatenation l 1 ∞ l 2 {\displaystyle L_{1}\cdot L_{2}} consists of all stringhe of the v form w {\displaystyle vw} where v {\displaystyle v} is a string. Star Kleene: the language that consists of all the words that are concatenations of zero or morein the original language; Inversion: # Let ε be the void word, then ε R = ε {\displaystyle \varepsilon {^R}=\varepsilon } , and for every non-empty word w = σ 1, σ n {\displaystyle w=\sigma {_1}\cdots {_n} A language class is closed under a special operation when the operation, applied to the class languages, always produces a language in the same class again. For example, contextless languages are known to be closed in union, concatenation and intersection with regular languages, but not closed under intersection or complement. The theory of the trio and abstract families of languages studies the most common closing properties of language families in their right. [3] Closing properties of language families (L 1 {\displaystyle L_{1} Op L 2 {\displaystyle L_{2} where both L 1 {\displaystyle L_{1} and L 2 {\displaystyle L_{2} are in the linguistic family given by the column.) After Hopcroft and Ullman. DCFL CFL IND CSL Recursive Union L 1 habit L 2 = { w | w | L 1 ◀ w | L 2 } {\displaystyle L_{1}\cupero L_{2}=\{w\mid w\in L_{1}\lor w\in L_{2\} Yes Yes Yes Yes Yes Yes Yes Intersection L 1 gauze L 2 = { w | w | w | L 1 ◆ w | L 2 } {\displaystyle L_{1}\cap L_{2}=\{w\mid w\in L_{1}\land w\in L_{2\}} Yes No No Yes Complement ¬ L 1 = { w | {\displaystyle L 1 } {\displaystyle eg L_{1}=\w\mid wot \in L_{1\} Yes No Yes No Yes No Concatenation L 1 ∞ L 2 = { w z | L_{2}=\{wz\mid w\in L_{1}\land z\in L_{2\} ? Yes yes yes yes yes yes yes yes yes yes reverse L R
==L
} {\displaystyle L^{R}=\{w^{R}\mid w\in L\}} Yes Yes Yes Yes Yes with a regular language R {\displaystyle R} L gauze R = { w | w | w | L ◆ w | R } {\displaystyle L\cap R=\{w\mid w\in L\land w\in R\}} Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes Applications programming languages Syntax (planning language) and Compiler-compiler A compiler usually has two distinct components. A lexical analyzer, sometimes generated by a tool such as lex, identifies the tokens of the programming language grammar, for example, identifiers or keywords, numerical literals and strings, punctuation symbols and operator, which are themselves specified by a simpler formal language, usually by means of regular expressions. At the most fundamental conceptual level, a parser, sometimes generated by a parser generator like yacc, attempts to decide whether the source program is syntactically valid, i.e. if it is well formed than the grammar of the programming language for which the compiler was built. Of course, compilers do more than just parse the source code – usually translate it into some executable format. Because of this, a parser usually emits more than one yes/no response, typically an abstract syntax tree. This is used by the next steps of the compiler to eventually generate an executable containing machine code that runs directly on the hardware, or an intermediate code that requires a virtual machine to run. Theoretical theory, systems and tests This diagram shows syntactic divisions within a formal system. The strings of symbols can be divided into absurd and well formulated formulas. The set of well formed formulas is divided into theorems and not theorems. Main articles: Theory (Mathematic logic) and formal system In mathematical logic, a formal theory is a set of phrases expressed in a formal language. A formal system (also called a logical calculation, or a logical system) consists of a formal language along with a deductive apparatus (also called a deductive system). The deductive apparatus may consist of a set of transformation rules, which can be interpreted as valid rules of inference, or a set of axioms, or both have. A formal system is used to obtain an expression from one or more other expressions. Although a formal language can be identified with its formulas, a formal system cannot be identified by its theorems. Two F formal systems S {\displaystyle {\mathcal {FS}}} and F S ′ {\displaystyle {\mathcal {FS'}}} may have all the same theorems and however differ in a significant-theoretical way of testing (an A formula can be a syntactic consequence of a B formula in one but not another for example). A formal test or a derivation is a finite sequence of well formulated formulascan be interpreted as phrases or propositions) each of which is an axiom or follows from the preceding formulas in the sequence by a rule of inference. The last sentence in the sequence is a theorem of a formal system. The formal tests are usefultheir theorems can be interpreted as true propositions. Interpretations and models Main articles: Semantic formal (logic), Interpretation (logic) and model theory The formal languages are entirely syntactic in nature, but can be semantic dates that give meaning to the elements of the language. For example, in mathematical logic, the set of possible formulas of a particular logic is a formal language, and an interpretation gives meaning to each of the formulas—usually, a value of truth. The study of formal language interpretations is called formal semantics. In mathematical logic, this is often done in terms of model theory. In model theory, the terms that occur in a formula are interpreted as objects within mathematical structures, and the rules of fixed compositional interpretation determine how the value of the formula truth can be derived from the interpretation of its terms; a model for a formula is an interpretation of terms such that the formula becomes true. See also Combinetorics on words Free monoid formal method For example, the first-order logic is often expressed using an alphabet that, in addition to symbols such as ∫, ¬, and parentheses, contains infinitely many x0, x1, x2, elements that play the role of variables. See for example Reghizzi, Stefano Crespi (2009), Formal Languages and Compilation, Texts in Computer Science, Springer, p. 8, ISBN 9781848820500, An alphabet is a finished set. Martin Davis (1995). "Influence of mathematical logic on computer science". Rolf Herken (ed.). The universal machine Turing: a survey of the half century. 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