WHAT LANGUAGES DO COMPUTERS SPEAK

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Objectifs

À la fin de cette leçon, les étudiants seront capables de :

o Connaître l'histoire des langages de programmation

o S'approprier les raisons de la prépondérance de certains langages de programmation

o Connaître les programmes qui assurent d'un emploi dans le GAFAM

o Répondre à un questionnement à partir d'un passage audio

A history of computer languages

Objectifs

a short history of computer languages

1. text

The first programming languages *predate* the modern computer. At first, the languages were codes. During a nine-month period in 1842-1843, Ada Lovelace translated Italian mathematician Luigi Menabrea's memoir on Charles Babbage's newest proposed machine, the Analytical Engine. With the article, she *appended* a set of notes which specified in complete detail a method for calculating Bernoulli numbers with the Engine, recognized by some historians as the world's first computer program. Like many "firsts" in history, the first modern programming language is hard to identify.

In the 1940s the first recognizably modern, electrically powered computers were created. The limited speed and memory capacity forced programmers to write *hand tuned* assembly language programs. It was soon discovered that programming in assembly language required a great deal of intellectual effort and was *error-prone*. Some important languages that were developed in this period include: • 1943 - Plankalkül (Konrad Zuse) • 1943 - ENIAC coding system • 1949 - C-10.

In the 1950s the first three modern programming languages whose descendants are still in widespread use today were designed: • FORTRAN (1955), the "FORmula TRANslator", invented by John Backus et al.; • LISP, the "LISt Processor", invented by John McCarthy et al.; • COBOL, the COmmon Business Oriented Language, created by the Short Range Committee, heavily influenced by Grace Hopper. Another milestone in the late 1950s was the publication, by a committee of American and European computer scientists, of "a new language for algorithms"; the ALGOL 60 Report (the "ALGOrithmic Language"). Algol 60 was particularly influential in the design of later languages, some of which soon became more popular. Algol's key ideas were continued, producing ALGOL 68. Algol 68's many little-used language features and its complex system of syntactic *shortcuts* and automatic type coercions made it unpopular with *implementer*s and gained it a reputation of being difficult. Niklaus Wirth actually walked out of the design committee to create the simpler Pascal language.

The period from the late 1960s to the late 1970s brought a major flowering of programming languages. Most of the major language paradigms now in use were invented in this period: • Simula, invented in the late 1960s by Nygaard and Dahl as a *superset* of Algol 60, was the first language designed to support object-oriented programming. • C, an early systems programming language, was developed by Dennis Ritchie and Ken Thompson at Bell Labs between 1969 and 1973. • Smalltalk (mid 1970s) provided a complete ground-up design of an object-oriented language. • Prolog, designed in 1972 by Colmerauer, Roussel, and Kowalski, was the first logic programming language. • Each of these languages *spawn*ed an entire family of descendants, and most modern languages count at least one of them in their ancestry. Some important languages that were developed in this period include: • 1970 - Pascal • 1970 - Forth • 1972 - C • 1972 - Smalltalk • 1972 - Prolog • 1973 - ML • 1978 - SQL (initially only *a query language*, later extended with programming constructs)

The 1980s were years of relative consolidation. C++ combined object-oriented and systems programming. The United States government standardized Ada, a systems programming language intended for use by defense contractors. Some important languages that were developed in this period include: • 1983 - Ada • 1983 - C++ • 1985 - Eiffel • 1987 - Perl • 1989 - FL (Backus)

The 1990s saw no fundamental novelty, but much recombination as well as maturation of old ideas.

Some important languages that were developed in this period include:

- 1990 - Haskell
- 1991 - Python
- 1991 - Java
- 1993 - Ruby
- 1993 - Lua
- 1994 - ANSI Common Lisp
- 1995 - JavaScript
- 1995 - PHP
- 2000 - C#
- 2008 - JavaFX Script

2. Exercice

Exercice

Match the words with their definitions

[superset / spawn / append / shortcut / predate / implementer / query language / hand tuned / error-prone] = to have existed or happened before another thing

[superset / spawn / append / shortcut / predate / implementer / query language / hand tuned / error-prone] = to add something to the end of a piece of writing

[superset / spawn / append / shortcut / predate / implementer / query language / hand tuned / error-prone] = manual

[superset / spawn / append / shortcut / predate / implementer / query language / hand tuned / error-prone] = tending to make mistakes

[superset / spawn / append / shortcut / predate / implementer / query language / hand tuned / error-prone] = a quicker way of doing something in order to save time or effort, a quick way to start or use a computer program

[superset / spawn / append / shortcut / predate / implementer / query language / hand tuned / error-prone] = someone whose job is to put a plan or system into action

[superset / spawn / append / shortcut / predate / implementer / query language / hand tuned / error-prone] = a group which includes another group or other groups

[superset / spawn / append / shortcut / predate / implementer / query language / hand tuned / error-prone] = to cause something new, or many new things, to grow or start suddenly

[superset / spawn / append / shortcut / predate / implementer / query language / hand tuned / error-prone] =a way of getting particular information that you want from a large amount of information held on a computer database, spreadsheet

Exercice

Decide whether this statement is TRUE or FALSE

modern computers came into existence before the first programming language

- ◯ TRUE
- ◯ FALSE

Exercice

Decide whether this statement is TRUE or FALSE

It is quite easy to date the first programming language

- ◯ TRUE
- ◯ FALSE

Exercice

Decide whether this statement is TRUE or FALSE

New programming languages derive from old ones

- ◯ TRUE
- ◯ FALSE

WHAT MAKES A PROGRAMMING LANGUAGE IMPORTANT?

Objectifs

-importance of a programming language

1. Reasons for Importance of a Language

What are the reasons that one language becomes widely used or considered significant or both, while others remain for all practical purposes the property of a small group? The generally obvious answer is practicality; i.e. the language is suitable for a significant (although not necessarily large) class of problems and good compilers can be written for it. However, those are only the most obvious attributes, and underneath them lie a number of other factors, not all of them based on facts. For example, the psychological issue of snob appeal is more important than many people might think. Thus, the personal prestige and leadership (or lack thereof) of those individuals who are involved in the development of a language play an enormous role.

Some languages clearly create a spark, which causes the languages to become popular--sometimes to a level of fanaticism--regardless of the difficulties. This is equivalent to the "political charisma" which often affects election results. The best example of languages which inspire some people are ALGOL and APE\360; on the other hand neither BASIC (at the small end) nor PL/I (at the large end) generates as much personal enthusiasm by the users. It is hard *to pinpoint* the reasons for lack of charisma in a language, and it has very little to do with the actual use. For example, BASIC and COBOL are very widely used languages, but I doubt whether many people are personally enthusiastic about either of them.

In summary, there are really two major reasons for a language to be considered significant: one is that it is economically practical and hence very useful, and the other is that it is technically new.

2. Exercice

Select the reasons that make a programming language be appreciated by most users

- ☐ be widely known
- ☐ money saving
- ☐ recent
- ☐ create a spark

3. Exercice

Decide whether this statement is TRUE or FALSE

Developers of a programming language can influence its importance for users

- ◯ TRUE
- ◯ FALSE

4. Exercice

Fill in the table with different types of words

adjective	verb	noun	adverb
popular			
significant			
		leadership	

GRAMMAR

III

Objectifs

Use indefinite and definite articles appropriately

1. A, AN, THE

Definite and Indefinite articles.

A - AN :

A and an are indefinite articles used to refer to a singular countable noun.

An indefinite article means that we do not know which one, or it is not important to know it.

Which one to use: 'a' or 'an'?

The rule states that *"a"* should be used before words that begin with consonants (b, c ,d etc.), while *"an"* should be used before words that begin with vowels (a,e,i, etc.).

It should be noted, however, that the usage is determined by the pronunciation and not by the spelling, and this includes abbreviations and acronyms.

To simplify, one uses 'a' before a word that begins with a consonant SOUND, and 'an' before a word that begins with a vowel SOUND.

A is used before :

- *a consonant* (b, c, d, f, g, etc.) : a car /a hotel / a game
- *a vowel that is pronounced like "yu"* : a European /a university
- *the vowel 'o' when it has a "w" sound* : a one-way street

An is used before :

- *a vowel (a, e, i, o, u, etc.) :* an animal / an elevator / an only child
- *an unaspirated 'h' :* an hour/an honest man
- *an abbreviation starting with a vowel sound* : an MBA ('em' sound)

THE :

The is a definite article used to talk about something specific.

- The town where Julie lives is very big.
- What book is Julie reading? She's reading the book Tom gave her.

The is also used to refer to:

- *Rivers, seas, oceans :*

o the Mississippi river, the Mediterranean sea, the Atlantic ocean

- *Nationalities :*

o the British, the Americans, the Japanese, the Chinese, etc.

NO ARTICLE :

No article is used in generalisations:

• I like music

• I watch television but I listen to the radio and I go to the cinema.

• I don't play tennis but I play the piano, the guitar, etc.

No article is used for place names (towns, countries, mountains) :

• London, Spain, Mount Everest

Except if plural :

• The Greek islands, The United States, The Alps, The Himalayas ...

No article is used for months, sports

Christmas is in December

I likes Swimming.

No article is used for meals

He always has lunch with his children.

2. Exercice

Decide whether "a", "an", "the" or "Ø" fits in each gap

-Spanish is one of *[a | an | the | Ø]* widely spoken language in *[a | an | the | Ø]* world. It is spoken all over *[a | an | the | Ø]* South America except for *[a | an | the | Ø]* Brazil. Like Italian and Portuguese, *[a | an | the | Ø]* Spanish language is related to Latin. *[a | an | the | Ø | A]* recent report stated *[a | an | the | Ø]* number of Spanish speakers in *[a | an | the | Ø]* United States of America will be higher than *[a | an | the | Ø]* number of Englsh speakers by *[a | an | the | Ø]* year 2090. As *[a | an | the | Ø]* result of this, nearly all North American schools teach Spanish. *[a | an | the | Ø | The]* language with *[a | an | the | Ø]* most speakers in the world is Mandarin Chinese.

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LISTENING

IV

1. Exercice

Exercice

Choose the right answer

Is it important to know a particular programming language?

- ◯ yes
- ◯ no

Exercice

What matters if one wants to get a job at GAFAM?

- ☐ what language one knows
- ☐ coding skills
- ☐ technology one uses
- ☐ data structure and algonomous knowledge
- ☐ problem solving ability
- ☐ experience

Exercice

Among these two languages select the one that is easier to use

- ◯ Python
- ◯ C++

Exercice

Among these two languages select the one that is easier to use

- ◯ Java
- ◯ Java Script

Exercice

Where does one get experience to work at GAFAM

- ◯ at GAFAM training centre
- ◯ at smaller companies
- ◯ at school
- ◯ through tutorial

Exercice

Choose the right answer

If one is interesting in data science and machine learning, one should learn

- ◯ Python
- ◯ swift
- ◯ java script