

L

L

L WITH INVERTED LAZY S U+AB5E ? MODIFIER LETTER SMALL L WITH MIDDLE TILDE L with diacritics: ? ? ? ? ? ? ? L? l? ? ? ? ? ? ? ? ? ? ? ? ? ? :

?L?, or ?l?, is the twelfth letter of the Latin alphabet, used in the modern English alphabet, the alphabets of other western European languages and others worldwide. Its name in English is el (pronounced EL), plural els.

Laplace transform

each term, $L\{f(t) + g(t)\} = L\{f(t)\} + L\{g(t)\}$

In mathematics, the Laplace transform, named after Pierre-Simon Laplace (), is an integral transform that converts a function of a real variable (usually

t

$$\{\displaystyle t\}$$

, in the time domain) to a function of a complex variable

S

$$\{\displaystyle s\}$$

(in the complex-valued frequency domain, also known as s-domain, or s-plane). The functions are often denoted by

X

(

 t

)

$$\{ \displaystyle x(t) \}$$

for the time-domain representation, and

X

(

S

)

$$\{\mathrm{displaystyle X(s)}\}$$

for the frequency-domain.

The transform is useful for converting differentiation and integration in the time domain into much easier multiplication and division in the Laplace domain (analogous to how logarithms are useful for simplifying multiplication and division into addition and subtraction). This gives the transform many applications in science and engineering, mostly as a tool for solving linear differential equations and dynamical systems by simplifying ordinary differential equations and integral equations into algebraic polynomial equations, and by simplifying convolution into multiplication. For example, through the Laplace transform, the equation of the simple harmonic oscillator (Hooke's law)

x

$?$

$($

t

$)$

$+$

k

x

$($

t

$)$

$=$

0

$\{\displaystyle x''(t)+kx(t)=0\}$

is converted into the algebraic equation

s

2

X

$($

s

$)$

$?$

s

x

(

0

)

?

x

?

(

0

)

+

k

X

(

s

)

=

0

,

$$\{\displaystyle s^2X(s)-sx(0)-x'(0)+kX(s)=0,\}$$

which incorporates the initial conditions

x

(

0

)

$$\{\displaystyle x(0)\}$$

and

x

?

$$\begin{pmatrix} 0 \\ \end{pmatrix}$$

$$\{\displaystyle x'(0)\}$$

, and can be solved for the unknown function

$$X$$

$$\begin{pmatrix} s \\ \end{pmatrix}$$

$$\cdot$$

$$\{\displaystyle X(s).\}$$

Once solved, the inverse Laplace transform can be used to revert it back to the original domain. This is often aided by referencing tables such as that given below.

The Laplace transform is defined (for suitable functions

$$f$$

$$\{\displaystyle f\}$$

$$)$$
 by the integral

L

{

f

}

(

s

)

=

?

0

?

f

(
t
)
e
?
s
t
d
t
,

$$\mathcal{L}\{f\}(s)=\int_0^{\infty} f(t)e^{-st}\,dt,$$

here s is a complex number.

The Laplace transform is related to many other transforms, most notably the Fourier transform and the Mellin transform.

Formally, the Laplace transform can be converted into a Fourier transform by the substituting

$$s=i\omega$$

where

$$\omega$$

is real. However, unlike the Fourier transform, which decomposes a function into its frequency components, the Laplace transform of a function with suitable decay yields an analytic function. This analytic function has a convergent power series, the coefficients of which represent the moments of the original function. Moreover unlike the Fourier transform, when regarded in this way as an analytic function, the techniques of complex analysis, and especially contour integrals, can be used for simplifying calculations.

Unicode subscripts and superscripts

Supplement block has several more: Latin/IPA , Greek . The Cyrillic Extended-B

Unicode has subscripted and superscripted versions of a number of characters including a full set of Arabic numerals. These characters allow any polynomial, chemical and certain other equations to be represented in plain text without using any form of markup like HTML or TeX.

The World Wide Web Consortium and the Unicode Consortium have made recommendations on the choice between using markup and using superscript and subscript characters:

When used in mathematical context (MathML) it is recommended to consistently use style markup for superscripts and subscripts [...] However, when super and sub-scripts are to reflect semantic distinctions, it is easier to work with these meanings encoded in text rather than markup, for example, in phonetic or phonemic transcription.

Fraktur

marks. Stroked letters ʃ, ʒ, ʧ, ʤ, ʦ, ʣ, ʦ, ʣ are used for palatalized consonants (ʃʲ, ʒʲ, ʧʲ, ʤʲ, ʦʲ, ʣʲ), stroked variants of ʃs?

Fraktur (German: [fʁakˈtuːr]) is a calligraphic hand of the Latin alphabet and any of several blackletter typefaces derived from this hand. It is designed such that the beginnings and ends of the individual strokes that make up each letter will be clearly visible, and often emphasized; in this way it is often contrasted with the curves of the Antiqua (common) typefaces where the letters are designed to flow and strokes connect together in a continuous fashion. The word "Fraktur" derives from Latin *fractura* ("a break"), built from *fractus*, passive participle of *frangere* ("to break"), which is also the root for the English word "fracture". In non-professional contexts, the term "Fraktur" is sometimes misused to refer to all blackletter typefaces – while Fraktur typefaces do fall under that category, not all blackletter typefaces exhibit the Fraktur characteristics described above.

Fraktur is often characterized as "the German typeface", as it remained popular in Germany and much of Eastern Europe far longer than elsewhere. Beginning in the 19th century, the use of Fraktur versus Antiqua (seen as modern) was the subject of controversy in Germany. The Antiqua–Fraktur dispute continued until 1941, when the Nazi government banned Fraktur typefaces. After Nazi Germany fell in 1945, Fraktur was unbanned, but it failed to regain widespread popularity.

Lateral release (phonetics)

lateral consonant. Such sounds are transcribed in the IPA with a superscript ʟ, for example as [tʟ] in English spotless [ʃpʰtʟs]. In Old English words

In phonetics, a lateral release is the release of a plosive consonant into a lateral consonant. Such sounds are transcribed in the IPA with a superscript ʟ, for example as [tʟ] in English spotless [ʃpʰtʟs]. In Old English words such as *middle/middel* in which, historically, the tongue made separate contacts with the alveolar ridge for the /d/ and /l/, [ʔmʔdʟl], many speakers today make only one tongue contact. That is, the /d/ is laterally released directly into the /l/: [ʔmʔdʟʟ]. While this is a minor phonetic detail in English (in fact, it is commonly transcribed as having no audible release: [ʃpʰtʟs], [ʔmʔdʟʟ]), it may be more important in other languages.

In most languages (as in English), laterally-released plosives are straightforwardly analyzed as biphonemic clusters whose second element is /l/. In the Hmong language, however, it is sometimes claimed that laterally-released consonants are unitary phonemes. According to Peter Ladefoged and Ian Maddieson, the choice between one or another analysis is purely based on phonological convenience—there is no actual acoustic or articulatory difference between one language's "laterally-released plosive" and another language's biphonemic cluster.

Numerals in Unicode

modern IALs (Esperanto itself had displaced another similarly-motivated language, Volapük). Additionally, Esperanto has developed like other languages: through the interaction and creativity of its users.

In light of his achievements, and his support of intercultural dialogue, UNESCO selected Zamenhof as one of its eminent personalities of 2017, on the 100th anniversary of his death. According to Esperanto communities, as of 2019 there are approximately 2 million people speaking Esperanto, including approximately 1,000 native speakers, although evidence to that has been heavily disputed, and the last major effort to improve the estimate occurred in 2004.

Enclosed Alphanumerics

U+24Bx ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? U+24Cx ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? U+24Dx ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? U+24Ex ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ?

Enclosed Alphanumerics is a Unicode block of typographical symbols of an alphanumeric within a circle, a bracket or other not-closed enclosure, or ending in a full stop.

It is currently fully allocated. Within the Basic Multilingual Plane, a few additional enclosed numerals are in the Dingbats and the Enclosed CJK Letters and Months blocks. There is also a block with more of these characters in the Supplementary Multilingual Plane named Enclosed Alphanumeric Supplement (U+1F100–U+1F1FF), as of Unicode 6.0.

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