

L

L

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

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.
$$\mathcal{L}\{f(t) + g(t)\} = \mathcal{L}\{f(t)\} + \mathcal{L}\{g(t)\}$$

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

t

$$t$$

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

s

$$s$$

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

x

(

t

)

$$x(t)$$

for the time-domain representation, and

X

(

s

)

$$X(s)$$

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

,

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

which incorporates the initial conditions

x

(

0

)

$$x(0)$$

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

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f

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(

s

)

=

?

0

?

f

(
t
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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.

Fraktur

marks. Stroked letters *ſ, ſ, ſ, ſ, ſ, ſ* are used for palatalized consonants (*ſ, ſ, ſ, ſ, ſ, ſ*), stroked variants of *ſ*?

Fraktur (German: [fʁakˈtuʁ]) 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.

Unicode subscripts and superscripts

Supplement block has several more: Latin/IPA $\frac{1}{2}$ $\frac{3}{4}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{3}{8}$ $\frac{5}{8}$ $\frac{7}{8}$ $\frac{9}{16}$ $\frac{11}{16}$ $\frac{13}{16}$ $\frac{15}{16}$ $\frac{1}{32}$ $\frac{3}{32}$ $\frac{5}{32}$ $\frac{7}{32}$ $\frac{9}{32}$ $\frac{11}{32}$ $\frac{13}{32}$ $\frac{15}{32}$ $\frac{17}{32}$ $\frac{19}{32}$ $\frac{21}{32}$ $\frac{23}{32}$ $\frac{25}{32}$ $\frac{27}{32}$ $\frac{29}{32}$ $\frac{31}{32}$ $\frac{1}{64}$ $\frac{3}{64}$ $\frac{5}{64}$ $\frac{7}{64}$ $\frac{9}{64}$ $\frac{11}{64}$ $\frac{13}{64}$ $\frac{15}{64}$ $\frac{17}{64}$ $\frac{19}{64}$ $\frac{21}{64}$ $\frac{23}{64}$ $\frac{25}{64}$ $\frac{27}{64}$ $\frac{29}{64}$ $\frac{31}{64}$ $\frac{33}{64}$ $\frac{35}{64}$ $\frac{37}{64}$ $\frac{39}{64}$ $\frac{41}{64}$ $\frac{43}{64}$ $\frac{45}{64}$ $\frac{47}{64}$ $\frac{49}{64}$ $\frac{51}{64}$ $\frac{53}{64}$ $\frac{55}{64}$ $\frac{57}{64}$ $\frac{59}{64}$ $\frac{61}{64}$ $\frac{63}{64}$ $\frac{65}{64}$ $\frac{67}{64}$ 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5 6 7 8 9 A B C D E F Value 1 2 3 4 5 6 7 8 9 10 11 12 50 100 500 1,000 U+216x ? ? ? ? ? ? ? ? ? ? ?
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A numeral (often called number in Unicode) is a character that denotes a number. The decimal number digits 0–9 are used widely in various writing systems throughout the world, however the graphemes representing the decimal digits differ widely. Therefore Unicode includes 22 different sets of graphemes for the decimal digits, and also various decimal points, thousands separators, negative signs, etc. Unicode also includes several non-decimal numerals such as Aegean numerals, Roman numerals, counting rod numerals, Mayan numerals, Cuneiform numerals and ancient Greek numerals. There is also a large number of typographical variations of the Western Arabic numerals provided for specialized mathematical use and for compatibility with earlier character sets, such as ² or ³, and composite characters such as ½.

Enclosed Alphanumeric Supplement

? ? ? ? ? ? ? ? ? ? U+1F13x ? ? ? ? ? ? ? ? ? ? ? ? ? ? U+1F14x ? ? ? ? ? ? ? ? ? ? ? ? ? ?
 U+1F15x

Enclosed Alphanumeric Supplement is a Unicode block consisting of Latin alphabet characters and Arabic numerals enclosed in circles, ovals or boxes, used for a variety of purposes. It is encoded in the range U+1F100–U+1F1FF in the Supplementary Multilingual Plane.

The block is mostly an extension of the Enclosed Alphanumerics block, containing further enclosed alphanumeric characters which are not included in that block or Enclosed CJK Letters and Months. Most of the characters are single alphanumerics in boxes or circles, or with trailing commas. Two of the symbols are identified as dingbats. A number of multiple-letter enclosed abbreviations are also included, mostly to provide compatibility with Broadcast Markup Language standards (see ARIB STD B24 character set) and Japanese telecommunications networks' emoji sets. The block also includes the regional indicator symbols to be used for emoji country flag support.

?

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? or ?, described in English as *L with stroke*, is a letter of the Polish, Kashubian, Sorbian, Belarusian Latin, Ukrainian Latin, Kurdish (some dialects), Wymysorys, Navajo, Dëne S??né, Iñupiaq, Zuni, Hupa, Sm'álgyax, Nisga'a, and Dogrib alphabets, several proposed alphabets for the Venetian language, and the ISO 11940 romanization of the Thai script. In some Slavic languages, it represents the continuation of the Proto-Slavic non-palatal ?L? (dark L), which evolved further into /w/ in Polish, Kashubian, and Sorbian. In most non-European languages, it represents a voiceless alveolar lateral fricative or similar sound.

L. L. Zamenhof

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Zamenhof published Esperanto in 1887, although his initial ideas date back as far as 1873. He grew up fascinated by the idea of a world without war and believed that this could happen with the help of a new international auxiliary language (IAL). The language was intended as a tool to gather people together through neutral, fair, equitable communication. He successfully formed a community which has survived to this day, despite the World Wars of the 20th century and various attempts to reform the language or create more

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

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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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