¿Qué es LaTeX?

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UN POCO DE HISTORIA
Donald E. Knuth
Donald Knuth

From Wikipedia, the free encyclopedia

Donald Ervin Knuth (/kəˈnuːθ/; born January 10, 1938) is an American computer scientist, mathematician, and professor emeritus at Stanford University.

He is the author of the multi-volume work *The Art of Computer Programming*. He contributed to the development of the rigorous analysis of the computational complexity of algorithms and systematized formal mathematical techniques for it. In the process he also popularized the **asymptotic notation**. In addition to fundamental contributions in several branches of theoretical computer science, Knuth is the creator of the TeX computer typesetting system, the related METAfont font definition language and rendering system, and the Computer Modern family of typefaces.

As a writer and scholar, Knuth created the WEB and CWEB computer programming systems designed to encourage and facilitate literate programming, and designed the MIX/MMIX instruction set architectures. Knuth strongly opposes granting software patents, having expressed his opinion to the United...
Donald E. Knuth, Professor Emeritus of The Art of Computer Programming at Stanford University, welcomes you to his home page.

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1968

The Art of Computer Programming

VOLUME 1
Fundamental Algorithms
Third Edition

DONALD E. KNUTH
Volume 1 – Fundamental Algorithms (chapters 1 and 2)

Volume 2 – Seminumerical Algorithms (chapters 3 and 4)

Volume 3 – Sorting and Searching (chapters 5 and 6)

Volume 4 – Combinatorial Algorithms (chapters 7 and 8 released in several subvolumes)

Volume 5 – Syntactic Algorithms (as of 2011, estimated for release in 2020) (chapters 9 and 10)

Volume 6 – The Theory of Context-Free Languages (planned)

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Chapter 1 – Basic concepts (volume 1)
Chapter 2 – Information structures (volume 1)
Chapter 3 – Random numbers (volume 2)
Chapter 4 – Arithmetic (volume 2)
Chapter 5 – Sorting (volume 3)
Chapter 6 – Searching (volume 3)
Chapter 7 – Combinatorial searching (volume 4)
Chapter 8 – Recursion (volume 4)
Chapter 9 – Lexical scanning (also includes string search and data compression) (volume 5)
Chapter 10 – Parsing techniques (volume 5)
TeX es un lenguaje de bajo nivel, en el sentido de que sus acciones últimas son muy elementales
1978
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1985
3,14159265
The TeXbook

by Donald E. Knuth (Reading, Massachusetts: Addison-Wesley, 1984), x+483pp.
ISBN 0-201-13444-6
Russian translation by M. V. Lisina, edited by S. V. Klimenko and S. N. Sokolov, Vse pro TeX (Provino, Moscow: AO RDTeX, 1993), xvi+575pp.
Russian translation by L. F. Kozachenko, edited by Yu. V. Kozachenko, Vse pro TeX (Moscow: VIttiams, 2003), 549pp.

The definitive user manual and reference manual for TeX. Also published in hardcover as Computers & Typesetting, Volume A

The METAFONTbook

by Donald E. Knuth (Reading, Massachusetts: Addison-Wesley, 1986), xii+361pp.
ISBN 0-201-13444-6
Russian translation by Mustafa R. Salt-Ametov, Vse pro METAFONT (Moscow: VIttiams, 2003), 384pp.

The definitive user manual and reference manual for METAFONT. Also published in hardcover as Computers & Typesetting, Volume C.

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Donald Knuth
LaTeX está formado por un gran conjunto de macros de TeX, escrito por Leslie Lamport en 1984, con la intención de facilitar el uso TeX
\hbox{T\kern-.1667em\lower.5ex\hbox{E}\kern-.125ex X}

\TeX()
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Why LaTex is better choice than Microsoft Word? - ResearchGate
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10 nov. 2013 - Unfortunately I have no experience to write in LaTex. Is it better than Word? Where do I get supplementary materials on LaTex?

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msword - LaTeX vs Word; improvements of LaTeX over the years...
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• Lo mejor para grandes proyectos:
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  – División en múltiples partes
  – Excelente para generar índices, tablas de contenidos, bibliografía

• Multiplataforma

• Estable, no hay cambios de versiones (Word 6, Office 95, Office 97, Office 2000, Office 2003, 2007, 2010, ...), no hay presión para actualizarse

• No virus
¿Mejor que Word?

• Imbatible a nivel tipográfico
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\iiint_G [u \nabla^2 v + (\nabla u, \nabla v)] \, d^3 V = \iint_S \left( u \frac{\partial v}{\partial n} + v \frac{\partial u}{\partial n} \right) \, d^2 A
\]

\[
\iiint_G [u \nabla^2 v - v \nabla^2 u] \, d^3 V = \iint_S \left( u \frac{\partial v}{\partial n} - v \frac{\partial u}{\partial n} \right) \, d^2 A
\]
• ¿Dónde se sitúan normalmente las imágenes en un libro correctamente diseñado?
2. Information Systems Research as a Science

![Diagram](Fig. 2.1 The body of knowledge)

is useful and easy to use. In Chap. 3 below, we will return to the question of how we arrive at better theories in more detail.

2. We can improve our collections of scientific evidence. For example, we may be able to collect data about a phenomenon where no observations existed to date. A prime example is the famous voyage of Darwin on the Beagle, where he encountered and systematically described many previously unknown species of plants and animals. This evidence in turn allowed him and other scholars to refine their theories about plants and animals. In fact, it laid the groundwork for a whole new theory, the theory of evolution. Arriving at this theory was only possible because firstly systematic statements about observable facts were created through careful exploration and observation. We return to methods of observation later in this book (in Chap. 5).

3. We can better our methods for collecting observations in relation to theory.

Again, let me give you an example from the history of science. One of the most important contributions Galileo Galilei made was through the improvements he invented for telescopes, which initially were invented by Hans Lippershey. Galileo made a telescope with about 3x magnification and later made improved versions with up to about 30x magnification.

Through a Galilean telescope the observer could see magnified, upright images of the earth or the sky, a greatly improved measurement compared to previous instruments, which largely relied on the naked eye. It was only through these refined instruments that Galileo noted how the positions of some "fixed stars" relative to Jupiter were changing in a way that would have been impossible if they had been fixed stars (the current theory at the time). For one thing, he discovered that the "fixed stars" at some points in time were hidden behind Jupiter.

2.2 The Scientific Method

The improved measurements of the satellites of Jupiter created a revolution in astronomy that reverberates to this day: a planet with smaller planets orbiting it did not conform to the principles of Aristotelian Cosmology—the then prevalent astronomical theory, which held that all heavenly bodies should circle the Earth. Still, we know now that Galileo was right and that this breakthrough was possible because he initially did not refine the theory or the observations but instead improved our ability to measure relevant phenomena.

The above examples are meant to illustrate the manifold ways in which scientific progress can be achieved. Yet, it does not answer the question of how recognizable progress can be achieved. To that end, we need to look at the process of scientific inquiry and the postulates of the scientific method.

2.2 The Scientific Method

In Chap. 1, we asserted that in doctoral research we are asked to learn and execute studies that comply with two key principles of scientific research, namely, the research work contributes to a body of knowledge and the research work conforms to the scientific method.

We then illustrated several ways in which one can contribute to the body of knowledge through the scientific output created. Let us now turn to the notion of the scientific method. The scientific method describes a body of techniques and principles for investigating real-world phenomena with the view to adding to the body of knowledge.

Above we argued ambiguity in the connotation of the term "research" and that a doctoral program is about one type of research only, the class of scientific research. For research to be called scientific, the scientific method postulates that the inquiry must be based on gathering empirical and measurable evidence subject to specific principles of reasoning.

Although research procedures vary from one field of inquiry to another, the scientific method provides us with some common features that distinguish scientific inquiry from other methods of obtaining knowledge. Most notably, scientific inquiry is generally intended to be an objective as possible, to reduce biased...
the ability to interpret complex material in a sense-making process, a procedure that, by its very nature, is not independently repeatable as it is subject to the individual performing the inquiry.7

2.3 Essential Concepts in Information Systems Research

One of the most frequently occurring problems that I encounter with doctoral students is that, simply put, our conversations are hampered by us using "standard" research concepts and terms in different denotations. In a way, the problem is not so much that the theoretical constructs, operationalisations, measurements, and observations we are discussing are not precise enough, rather that our definitions of terms such as construct, concept, variable, etc. differ.

To resolve this problem, let us have a close look at the way that I define some essential concepts for usage in this book. I have tried to relate them in Fig. 2.2.

First, we need to define the term concept. A concept describes an abstract or general idea inferred or derived from specific instances that we perceive in the real world. Concepts are thus mental representations that we develop, typically based on experience. Concepts can be of real phenomena (dogs, clouds, pain) as well as of some latent phenomena that we can agree upon (truth, beauty, prejudice, usefulness, value, and so forth).

We use concepts as a language mechanism all the time to describe general properties or characteristics that we ascribe to certain things or phenomena. For example, we use the concept of weight to describe the force of gravity on objects. Weight is a general property that applies to all tangible things in the real world, but we can also use the same concept, weight, to illustrate the psychological state of someone experiencing stress, tension, and anxiety as we do when we refer to the "weight on their shoulders". We are sometimes also develop new concepts to describe a new or newly discovered property. Emotional intelligence, for example, is a concept that purports to describe our self-perceived ability to identify, assess, and control the emotions of oneself, of others, and of groups. This concept has gained some prominence in a debate regarding whether it is a personality trait or a form of intelligence not accounted for in currently prevalent theories of intelligence or personality (which, by the way, are also concepts).

An abstract unit of meaning, concepts play a key role in the development and testing of scientific theories. They should serve a vocabulary to reason about some real-world phenomena (or the linkage between real-world phenomena, as shown in Fig. 2.2) and a means to ascribe characteristics or properties to those phenomena and their relationships. Concepts can be linked to one another via propositions—suggested tentative or conjectured relationships between two or more concepts.8

7Note again that these statements do not qualify those research inquiries but are merely used to distinguish different strands of research.

8Note again that these statements do not qualify those research inquiries but are merely used to distinguish different strands of research.

Fig. 2.2 Essential concepts in the research process

that are stated in a declarative manner, more intelligence leads to better decisions, for example.

Note the key words suggestion, tentativeness, and conjecture that I apply to the notion of a proposition. These terms characterise the fact that propositions are proposals for an explanation about how phenomena are related. Whether or not the propositions hold true is an entirely different question and typically, an empirical one that we need to answer carefully through dedicated research methods.

The problem with concepts is that many of the phenomena we are interested in such as satisfaction, empathy, intelligence, anxiety, skill, and so forth, are fuzzy and imprecise. This is mostly because most phenomena of interest are not directly observable, and instead rather abstract and difficult to capture, define, or visualise. It is also because in the social sciences we often are concerned with understanding behaviours, processes, and experiences as they relate to "information technology in use".

For example, take the simple proposition "education increases income". The concepts of education and income are, by definition, abstract and could have many meanings. Conclusively, there are many, potentially unrelated ways in which such a proposition could be tested—and in turn, many different results could be obtained. Therefore, a proposition (also called a conceptual hypothesis) cannot be tested. They need to be converted into an operational hypothesis.

As per Fig. 2.2 above, we note that hypotheses are suggested linkages between constructs. Constructs are operationalised concepts, where we attempt to take the
3.2 Research Design

![Diagram of the research design process]

3.2.2 Selecting a Research Design

The discussion above provides common ground to all types of research designs in the sense that good research design typically includes work that combines...
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How to Keep Figures at the Top of a Page in Word 2013

Faith A. Morrison (fmorriso@mtu.edu)
Department of Chemical Engineering
Michigan Technological University

29 September 2014

This is a brief document with one method of keeping Figures or Tables located at the top (or bottom) of a page. Without special measures, Microsoft Word will position these elements at positions on the page that do not conform to standard practice for report writing. Please send your feedback on these instructions and I will improve them.

The method employed here is to put the graphic (picture, figure, table) and its caption into a textbox and then position the textbox at the top or bottom of the page. The steps are listed below.

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Inserting a Figure or Table

1. I recommend that you initially place all your figures and tables in order at the back of the report and only move them to their places within the text after you are done drafting the report. With this practice, you can save time struggling with the graphics until the end, when you know they are staying in the report.

2. To insert a figure or table, in your Word file, place many blank lines at the end of the document to use as placeholder text.

3. Position your cursor at the desired location at the end of the document and insert a textbox as follows: choose Insert, Text Box, Draw Text Box, and draw the textbox anywhere on the page to span the width of your page.

4. Click inside the textbox. Write your caption in the box.

5. Insert your graphic (table or figure) as follows: Choose Insert, Picture, and choose the file you are inserting. Alternatively, go to Excel, grab the graphic you are inserting, and Paste it into the textbox. To be able to resize the graphic, Paste Special as a Picture-Windows Metafile. You can drag the textbox to be larger or smaller, as desired.

6. Click on the graphic and center it within the textbox (Home, paragraph center)

7. Remember that the caption goes at the top of a table and at the bottom of a figure. You can adjust the width of the caption within the textbox by adjusting the size (left to right) of the textbox.

8. To prevent any text from wrapping to the left or right of your graphic, click on the text box, and under Drawing Tools, Wrap Text, choose Top and Bottom.

9. Remove the black outline from the textbox by clicking on the text box, then Drawing Tools, Shape Outline, No Outline.

Once the document is near completion, you can adjust where the textboxes are placed by moving the
Moving the anchor for a text box

1. Click on *Home* and ¶ to show all the hidden symbols in the document.
2. Click on the textbox. The location of the anchor is marked by an icon in the shape of an anchor.

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3. Drag the anchor to a location a few lines down from the text that calls out the graphic (the text that says “See Figure 2” for example).
4. To force the text box to be centered at the top (or bottom) of the page, click on the text box, and under *Text Box Tools, Position*, choose the icon that shows the graphic located at the top and center (or at the bottom and center if you prefer).
5. To allow adequate white space between the graphic and the text, you can increase the size of the textbox. You may need to add blank lines to the top of the textbox to force white space at the top of the textbox.
6. Experiment with graphics locations until you achieve the placement you desire. It is desirable to avoid large regions of white space. Also, figures and tables should appear in the sections in which they are first called out.
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• ¿Cómo se logra eso en LaTeX?
• ¡¡¡No hay que hacer nada, es automático!!!
• Word:
  – WYSIWYG: What you see is what you get

• LaTeX:
  – WYMIWYG: What you mean is what you get
LaTeX vs. Word

LaTeX is a document preparation system designed for technical and scientific communication. It produces professionally typeset documents. With LaTeX, you do not format as you type. Instead, you write in a plain text file and enter commands to indicate where text needs to be styled in a particular way (e.g., title, section heads, figures, and captions). The software creates a final typeset output.

LaTeX handles equations particularly well. In Word, you must use the mouse to insert mathematical symbols. In LaTeX, you type the equations on the keyboard using commands to indicate the correct formatting. Because you are entering plain text, editing a LaTeX document can be easier. Figures are correctly placed. LaTeX can automatically generate references and indexes. Another benefit is that it is available free of charge.

LaTeX has a learning curve and is highly customizable, but it is recommended that authors avoid customization as much as possible in order to minimize errors in the production process that can be caused in the conversion of a file from a custom to standard version of LaTeX.

Word can produce a reasonably professional document with very little training. You can see how your document will look as you are writing it. It also includes features that can help in editing your article, such as spell check and grammar check.
LECTURAS SUGERIDAS
LaTeX es un lenguaje de macros creado en 1982 por Leslie Lamport para facilitar la composición de textos con el compilador TeX que había aparecido en 1978 de la mano de Donald Ervin Knuth en la Universidad de Stanford. Pero ¿es LaTeX la herramienta adecuada para mí?, se estará preguntando. Lo es, sin duda, si necesita escribir documentos científicos o técnicos, con fórmulas matemáticas, aunque sean pocas. También lo es si necesita escribir un libro, técnico o no, o en cualquier otro caso, si gusta de escribir documentos de la más alta calidad posible. LaTeX es también, sin duda, su herramienta si sus documentos electrónicos tienen que viajar por Internet como anexos de sus mensajes de correo electrónico pues los ficheros producidos por LaTeX son de tamaño muy reducido. Si usted prefiere que sus documentos no viajen por la red pero que sean transformados a formato HTML o PDF para ser leídos directamente en su servidor web, LaTeX también le resolverá el problema.

Actualmente LaTeX es un producto muy evolucionado con respecto a la versión original de Leslie Lamport y a su espectacular auge ha contribuido el que es un producto gratuito, de gran calidad, de gran flexibilidad, que nació para adaptarse constantemente a las evoluciones informáticas, que es utilizado en plan profesional por muchas empresas editoriales y que muchas personas producen constantemente paquetes que resuelven las necesidades de casi todos sus potenciales usuarios.

Cuando usted escriba con LaTeX, éste se encargará por sí sólo de dar formato al documento; elegir el tipo de letra a utilizar según el contexto; separar cabeceras y texto; realizar sangrados donde proceda; justificar el texto; insertando guiones automáticamente y evitando que en una línea los espacios en blanco sean demasiado grandes o demasiado pequeños; decidir donde colocar figuras y tablas (como objetos flotantes) para que la impresión visual de un texto que las contenga sea "profesional", llevar todos los contadores de páginas, capítulos, secciones, etc. y realizar de forma automática las referencias cruzadas; generar automáticamente unos índices generales e índices terminológicos; generar listas bibliográficas a partir de bases de datos de bibliografía; importar todo tipo de gráficos; etc.
Preparación de textos con \LaTeX

1 Escritura básica de texto
El documento \LaTeX\ es un sistema de salida para archivos \TeX\ que permite escribir documentos de alto nivel. En \LaTeX\ se forma un diseño de la estructura del documento con \LaTeX\ y se genera un archivo \TeX\ con una sintaxis que permite a \TeX\ entender el diseño de la estructura del documento.

\documentclass[espanol]{article}

\begin{document}

\section{Estructura del documento}
La estructura general de un documento \LaTeX\ es:

\begin{verbatim}
\documentclass[options]{class};
\begin{document};
\end{document};
\end{verbatim}

\section{Espacios}
Un espacio en blanco en el texto fuente produce un espacio en blanco en el texto compilado. Un salto de línea es equivalente a un espacio en blanco. Una línea en blanco produce un salto de página. Varias líneas en blanco consecutivas equivalen a una línea en blanco.

Para conseguir varios espacios seguidos hemos de usar \ LaTeX\ permite escribir
\begin{verbatim}
\hspace{10pt}
\end{verbatim}

\section{LaTeX\ y \TeX\}
LaTeX\ es un sistema de salida para archivos \TeX\ que permite escribir documentos de alto nivel. En \LaTeX\ se forma un diseño de la estructura del documento con \LaTeX\ y se genera un archivo \TeX\ con una sintaxis que permite a \TeX\ entender el diseño de la estructura del documento.

En la pág. 5 y ss. se habla de...
The Not So Short
Introduction to \LaTeX\ 2ε

Or \TeX\ 2ε in 137 minutes

by Tobias Oetiker
Hubert Partl, Irene Hyna and Elisabeth Schlegl

Version 5.01, April 06, 2011

http://tobi.oetiker.ch/lshort/lshort.pdf
Xaria has nominated himself for use of the Checkuser tools. Please provide your input on this important decision.

LaTeX

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This is a guide to the LaTeX markup language. It is intended to form a useful resource for everybody from new users who wish to learn, to old hands who need a quick reference.

TeX and LaTeX

\TeX\ is a computer program for typesetting documents, created by Donald Knuth. It takes a suitably prepared computer file and converts it to a form which may be printed on many kinds of printers, including dot-matrix printers, laser printers and high-resolution typesetting machines. \LaTeX\ is a set of macros for \TeX\ that aims at reducing the user's task to the sole role of writing the content. \LaTeX\ taking care of all the formatting process. A number of well-established publishers now use \TeX\ or \LaTeX\ to typeset books and mathematical journals. It is also well appreciated by users caring about typography, consistent formatting, efficient collaborative writing and open formats.

The book is organized in different parts.

- \textbf{Getting Started} will provide you with the very first steps to print your first document: general concepts (very important), software installation, and basic syntax.

- \textbf{Common Elements} groups all common features you would expect from a document processor, covering fonts, layout, colors, lists, figures and others.

- \textbf{Mechanics} are some topics that are not really necessary to write a basic document, but could help you understand how some parts of the machinery work. These topics are required for fine tuning documents. Use them as support for various chapters, as they are often being referred to.

- \textbf{Technical Texts} focuses on different specialized matters, mostly for scientific work.

- \textbf{Special Pages} is for the structured pages usually put in appendices.

- \textbf{Special Documents}: this part tackles other kind of documents different from the classic article style.
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