CS699
Latex Advanced

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Overview

Itemize

- $L^A T_E X$ typesets a file of text using the TEX program.
- $L^A T_E X$ is widely used in academia for the communication and publication of scientific documents in many fields, including mathematics, physics, computer science, statistics, economics and political science.[?]
- $L^A T_E X$ can be used as a standalone document preparation system or as an intermediate format.
- LaTeX is intended to provide a high-level language that accesses the power of TeX in an easier way for writers.

Enumerate

1. $L^A T_E X$ typesets a file of text using the TEX program.[**?**]
2. $L^A T_E X$ is widely used in academia for the communication and publication of scientific documents in many fields, including mathematics, physics, computer science, statistics, economics and political science.
3. $L^A T_E X$ can be used as a standalone document preparation system or as an intermediate format.
4. LaTeX is intended to provide a high-level language that accesses the power of TeX in an easier way for writers.
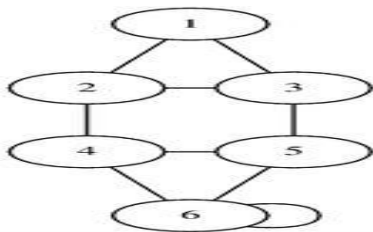
Description

- **Red** A colour at the end of the spectrum next to orange and opposite violet, as of blood, fire, or rubies. program.
- **Blue** A colour intermediate between green and violet, as of the sky or sea on a sunny day.
- **White** The colour of milk or fresh snow, due to the reflection of all visible rays of light; the opposite of black.
- **Black** The darkest colour owing to the absence of or complete absorption of light; the opposite of white.

Matrix

Adjacency matrix of corresponding graph.

$$
\begin{array}{c|cccccc}
 & \mathbf{1} & \mathbf{2} & \mathbf{3} & \mathbf{4} & \mathbf{5} & \mathbf{6} \\
\mathbf{1} & 0 & 1 & 1 & 0 & 0 & 0 \\
\mathbf{2} & 1 & 0 & 1 & 1 & 0 & 0 \\
\mathbf{3} & 1 & 1 & 0 & 0 & 1 & 0 \\
\mathbf{4} & 0 & 1 & 0 & 0 & 1 & 1 \\
\mathbf{5} & 0 & 0 & 1 & 1 & 0 & 1 \\
\mathbf{6} & 0 & 0 & 0 & 1 & 1 & 2
\end{array}
$$

Equation array

$$
\begin{aligned}
\cos 2\theta &= \cos^2 \theta - \sin^2 \theta & (1) \\
&= 2\cos^2 \theta - 1. & (2) \\
\cos^3 \theta + \sin^3 \theta &= (\cos \theta + \sin \theta)(\cos 2\theta - \cos \theta \sin \theta) & (3) \\
&= (\cos \theta + \sin \theta)(1 - \cos \theta \sin \theta) & (4) \\
&= (\cos \theta + \sin \theta)(1/2)(2 - 2\cos \theta \sin \theta)(3) & (5) \\
&= (1/2)(\cos \theta + \sin \theta)(2 - \sin(2\theta)) & (6)
\end{aligned}
$$

Prepositional formulae

$\neg(\forall x)(\varphi(x)) \longleftrightarrow (\exists x)\neg\varphi(x)$
$(\forall x)(\psi(x) \wedge \psi(x)) \longleftrightarrow ((\forall x)\varphi(x) \wedge (\forall x)\varphi(x))$
$(\exists x)(\varphi(x) \wedge \psi(x)) \longleftrightarrow ((\exists x)\varphi(x) \wedge (\exists x)\psi(x))$
$((\forall x)\varphi(x) \wedge (\forall x)\psi(x)) \longrightarrow (\forall x)(\varphi(x) \wedge \psi(x))$
$(\exists x)(\varphi(x) \wedge \psi(x)) \longrightarrow ((\exists x)\varphi(x) \wedge (\exists x)\varphi(x) \wedge (\exists x)\psi(x))$

Alphabets

Greek letters:	αA βB $\gamma \Gamma$ $\rho \varrho P$ $\sigma \Sigma$ $\delta \Delta$ $\epsilon \varepsilon E$
Binary operators:	$\times$ $\otimes$ $\oplus$ $\cup$ $\cap$
Relation operators:	$\subset$ $\supset$ $\subseteq$ $\supseteq$ $<$ $>$
Others:	$\int$ $\oint$ $\sum$ $\prod$

Mathematical Formulas

1. $\frac{\pi}{4} = \sum\limits_{n=0}^{\infty} \frac{(-1)^n * \overbrace{(1+1+\cdots+1)}^{n}}{(2n+1)*n}$

2. $\int_a^b x^3 \, \mathrm{d}x = \frac{1}{4}x^4 \Big|_a^b$

3. $\frac{\pi}{4} = 4 \sum\limits_{n=0}^{\infty} \frac{(-1)^n}{(2n+1)5^{2n+1}} - \sum\limits_{n=0}^{\infty} \frac{(-1)^n}{(2n+1)239^{2n+1}}$

4. $\pi = \frac{3\sqrt{3}}{4} - 24 \sum\limits_{n=0}^{\infty} \frac{\frac{(2n)!}{(n)!}}{2n+1(2n-1)4^{2n+1}}$

5. $\frac{1}{\pi} = \frac{2\sqrt{2}}{9801} \sum\limits_{n=0}^{\infty} \frac{(4n)!(1103+26390n)}{(n)!^4 396^{4n}}$

Quotations

The margins of the quotation environment are indented on both the left and the right. The text is justified at both margins. Leaving a blank line between text produces a new paragraph.The package **csquotes** offers a multilingual solution to quotations, with integration to citation mechanisms offered by BibTeX. This package allows one for example to switch languages and quotation styles according to babel language selections.

> *"Unlike the quote environment, each paragraph is indented normally. It's important to remark that even if you are typing quotes on English there are different quotation marks used in English (UK) and English (US)."*

Quotes

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> *"Unlike the quotation environment, paragraphs are not indented. It's important to remark that even if you are typing quotes on English there are different quotation marks used in English (UK) and English (US)."*

Citations

Latex[1] is a document preparation system for typesetting program. It is used to create different types of document structures. A Latex file (.tex) is created using any text editor (vim, emacs, gedit, etc.).

Type style[4] is used to indicate logical structure. E

There are two ways of producing a bibliography[3].The bibliography style can be declared with

bibliographystyle command, which may be issued anywhere after the preamble. They are part of the LaTeX package; a student does not need to download it. The plain.bst and alpha.bst styles are explained below.

The symbols in a math formula fall into different classes that correspond more or less to the part of speech each symbol would have if the formula were expressed in words. [2]

tabbing

```
int main(){
    int a,b,i=1;
    cin≫ a;
    cin≫ b;
    if(a>5){
            while(i<a){
                    b=b+10;
                    i++;
            }
    }     cout≪ b;
}
```

Algorithmic

Input: A graph *Graph* and a starting vertex *root* of *Graph*
Output: All vertices's reachable from *root* labeled as explored.
1 Breadth-First-Search(Graph, root):
2 **for** *each node n in Graph:* **do**
3 | *n*.**distance** = INFINITY
4 | *n*.**parent** = NIL
5 **end**
6 create empty **queue** Q
7 root.**distance** = 0
8 Q.**enqueue**(root)
9 **while** *Q is not empty:* **do**
10 | current = Q.dequeue()
11 | **for** *each node n that is adjacent to current* **do**
12 | | **if** *n*.distance == *INFINITY* **then**
13 | | | *n*.**distance** = current.**distance** + 1 *n*.**parent** = current *Q*.**enqueue**(n)
14 | | **end**
15 | **end**
16 **end**

Algorithm 1: Breadth-first search

Epigraph style

Chapter 1: Theory of life

"failure will never overtake me if my determination to succeed is strong enough."

og mandino

Minipage

L^AT_EX typesets a file of text using the TEX program and the L^AT_EX "macro package" for TEX. That is, it processes an input file containing the text of a document with interspersed commands that describe how the text should be formatted. L^AT_EX files are plain text that can be written in any reasonable editor.

In the L^AT_EX input file, a command name starts with a followed by either (a) a string of letters or (b) a single non-letter. Arguments contained in square brackets, [], are optional while arguments contained in braces, {}, are required. L^AT_EX is case sensitive. Enter all commands in lower case unless explicitly directed to do otherwise.

References

[1] Firuza Aibara. LaTeX - Fundamental Research Group - IIT Bombay.
    `http://www.it.iitb.ac.in/frg/wiki/index.php/LaTeX/`, 2016.

[2] Michael Downes. *Short math guide for LATEX*. American Mathematical Society,
    2002.

[3] Helmut Kopka and Patrick W Daly. A guide to latex, 1995.

[4] Leslie Lamport. *Latex*. Addison-Wesley, 1994.

THANK YOU!!!