Markov Chain Monte Carlo Algorithm and its Application

Applied Math Tutorial

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Outline

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Latex and Beamer

LaTeX is a high-quality typesetting system; it includes features designed for the production of technical and scientific documentation.

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Beamer is a LaTeX class to create powerful, flexible and nice-looking presentations and slides.
The beamer class is focussed on producing (on-screen) presentations, along with support material such as handouts and speaker notes.

Outline

Block and Alert

Pythagorean theorem

$$a^2 + b^2 = c^2$$

lengths of the sides, and c the length of the hypotenuse and a and b the lengths of the triangle's legs (sides).

Remark

- the environment above is **block**
- the environment here is **alertblock**

Proof

Pythagorean theorem

$$a^2 + b^2 = c^2$$

Proof.

$$3^2 + 4^2 = 5^2$$
$$5^2 + 12^2 = 13^2$$

□

Algorithm

Data: this text
Result: how to write algorithm with LaTeX2e
initialization;
while *not at end of this document* **do**
    read current;
    if *understand* **then**
        go to next section;
        current section becomes this one;
    else
        go back to the beginning of current section;
    end
end

Algorithm 1: How to write algorithms (copied from here)

An Algorithm For Finding Primes Numbers.

```
int main (void)
{
    std::vector<bool> is_prime (100, true);
    for (int i = 2; i < 100; i++)
    if (is_prime[i])
    {
        std::cout << i << " ";
        for (int j = i; j < 100; is_prime [j] = false, j+=i);
    }
    return 0;
}
```

Note the use of \alert.

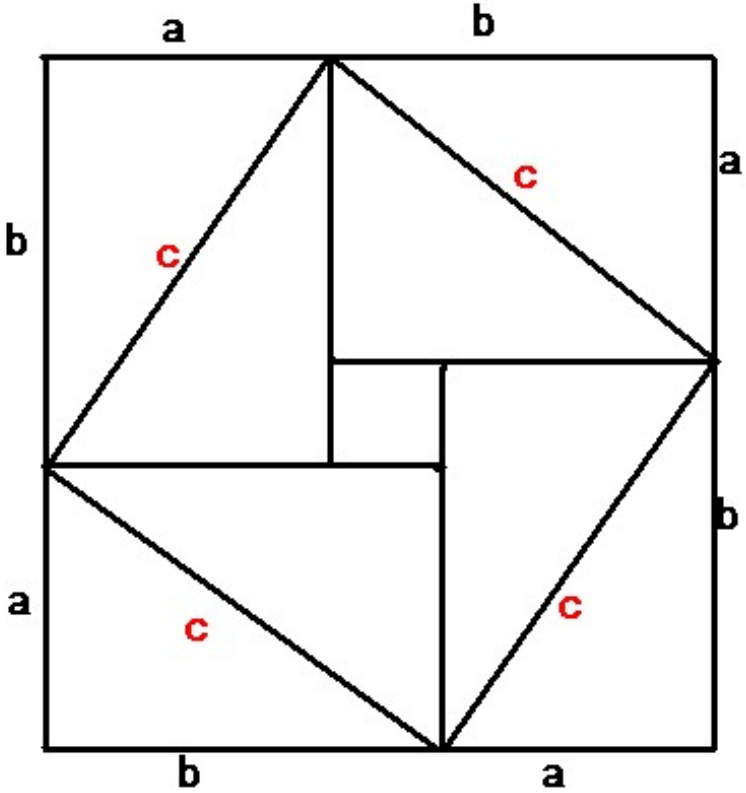
More

More environments such as

- Definition
- lemma
- corollary
- example

Outline

Minipage



1. item
2. another
3. more
   - first
   - second
   - third

Columns

This is a text in first column.

$$E = mc^2$$

- First item
- Second item

first block

columns achieves splitting the screen

second block

stack block in columns

Create Tables

first	second	third
1	2	3
4	5	6
7	8	9

Equation1

A matrix in text must be set smaller: $\left(\begin{smallmatrix} a & b \\ c & d \end{smallmatrix}\right)$ to not increase leading in a portion of text.

$$f(n) = \begin{cases} n/2 & \text{if } n \text{ is even} \\ -(n+1)/2 & \text{if } n \text{ is odd} \end{cases}$$

$$50 apples \times 100 apples = lots of apples^2$$

Equation2

$$\sum_{\substack{0<i<m \\ 0<j<n}} P(i,j) = \int_a^b \prod P(i,j)$$

$$P\left(A = 2 \middle| \frac{A^2}{B} > 4\right)$$

$$(a), [b], \{c\}, |d|, \|e\|, \langle f \rangle, \lfloor g \rfloor, \lceil h \rceil, \ulcorner i \urcorner$$

Equation3

$$Q(\alpha) = \alpha_i \alpha_j y_i y_j (x_i \cdot x_j)$$

$$Q(\alpha) = \alpha^i \alpha^j y^{(i)} y^{(j)} (x^i \cdot x^j)$$

$$\Gamma = \beta + \alpha + \gamma + \rho$$

Outline

End

The last page.