LaTeX - The Document Preparation System

Frederick Zhang

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Abstract

A brief introduction to LaTeX.
Keyword: LaTeX

1 Introduction

LaTeX was first developed in the early 1980s by Leslie Lamport, and it was based on Donald E. Knuth's TeX typesetting language. (**8732314920150101**) Latex is a stable dispersion (emulsion) of polymer microparticles in an aqueous medium. It is found in nature, but synthetic latexes can be made by polymerizing a monomer such as styrene that has been emulsified with surfactants. (**LaTeXWiki**)

2 Basic

1. Enum 1
   Hello World
2. Enum 2
   I can eat glass, it doesn't hurt me.

Item I The quick brown fox jumps over the lazy dog.

Item II Foo Bar

3 Table

Col 1	Col 2	Col 3
Hello	128	256
World	512	1024

4 Formula

1. Sample 1

$$s_N = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \overline{x})^2}$$

2. Sample 2

$$f(x;\mu,\sigma) = \frac{1}{\sigma\sqrt{2\pi}} exp(-\frac{(x-\mu)^2}{2\sigma^2})$$

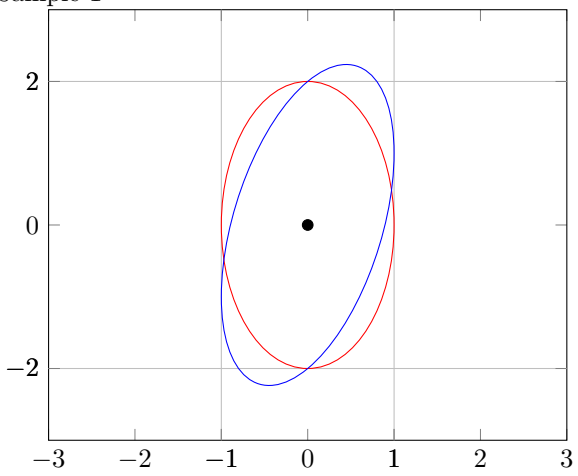
3. Sample 3

$$\hat{f}(\xi) = \int_{-\infty}^{\infty} f(x) e^{-2\pi i x \xi}$$

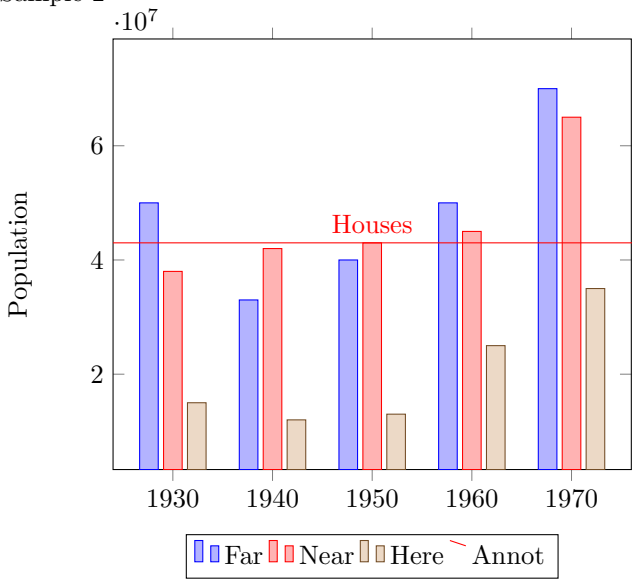
5 Chart

There are generally two suggested approaches to generate charts in LaTeX - pgfplots and gnuplot.
pgfplots is a package for LaTeX and it's easier to use.

1. Sample 1

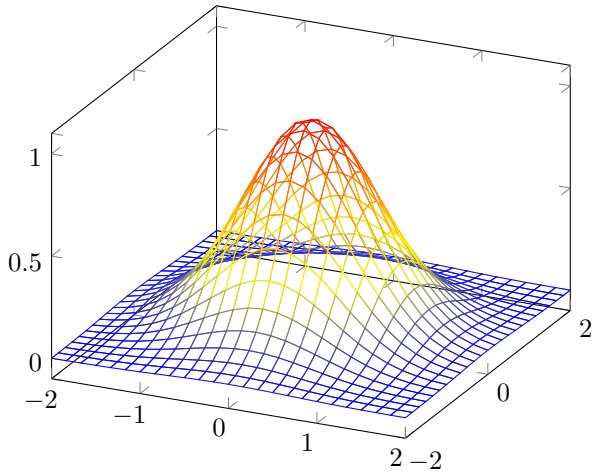


2. Sample 2

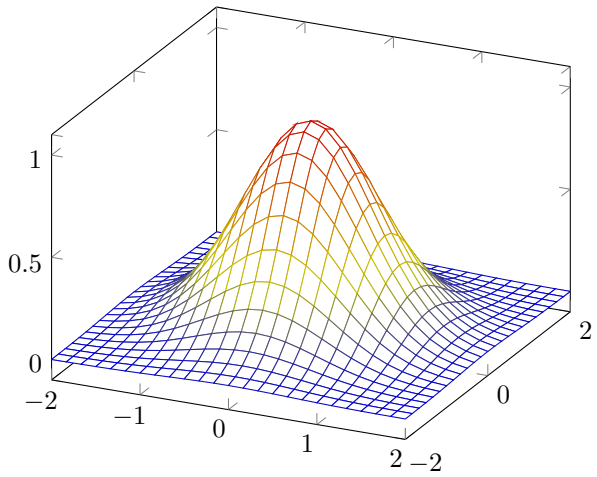


3. Sample 3

With background



Without background



6 Referencing

The *Harward Referencing* is preferred in Australia.
We use biber and biblatex to manage the citations.
Biber is a bibliography information processing program and works in conjunction with the LaTeX package biblatex and offers full Unicode support. (**BiberWiki**)

7 Pseudo-code

algorithmicx is suggested to handle pseudo-codes. To make use of it, we need two packages - algorithm and algpseudocode.

1. Sample 1

Algorithm 1 Sample 1

```
function HelloWorld(n)
    for i ← 0 to n − 1 do                          ▷ print n "hello"s
        PrintLine(hello)
```

2. Sample 2

Algorithm 2 Sample 2

```
    function Triangulable(P[0..n − 1])    ▷ elements of P are pairs < x, y >
2:      if n < 3 then
            return false
4:      for i ← 0 to n − 2 do
            array[0..n − i − 1] ← [null..null]
6:          for j ← i + 1 to n − 1 do
                x1, y1 ← P[i]
8:              x2, y2 ← P[j]
                if x1 ≠ x2 then
10:                 slope ← (y2 − y1)/(x2 − x1)
                else
12:                 slope ← null
                array[j − i − 1] ← slope
14:         HeapSort(array)                   ▷ introduced in Week 7 lecture
            for j ← 1 to n − i − 2 do
16:             if array[j] = array[j + 1] then
                    return false
18:     return true
```

8 Suggested Online Resources

https://en.wikibooks.org/wiki/LaTeX
https://tex.stackexchange.com/
https://www.ctan.org/
http://pgfplots.sourceforge.net/