

# A Template File for Writing L<sup>A</sup>T<sub>E</sub>X Articles

(Originally Written for Math 270A class.)

Guang-Shan Jiang  
Dept. of Math. UCLA

Leslie Lamport  
D.E.C.

edited by Doreen De Leon  
Dept. of Math. UCLA

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## Abstract

In this article, we want to provide some templates for the frequently used features in L<sup>A</sup>T<sub>E</sub>X, such as lists and tables.

## 1 Introduction

We want to give you some templates in this article which we think you will use the most. These are intended for those who never used T<sub>E</sub>X or L<sup>A</sup>T<sub>E</sub>X before. To use this template, make sure the format selected is L<sup>A</sup>T<sub>E</sub>X (the button next to the Typeset button), then press the Typeset button.

We suggest two books for reference [1] and [2]. Please consult these books or your favorite books for details.

## 2 Making lists, arrays and tables

The `\label` (used above) is for use in referencing the section (or equation or table, etc.) at other places in the same article.

To make an enumerated list, do the following:

1. It is easy.
2. I can even put an equation here

$$u_t + f(u)_x = 0$$

To make an itemized list, do the following:

- It is easy.
- I can even put an equation here

$$u_t + f(u)_x = 0$$

To make a table, centered and with caption and label, follow the following procedure. Again the label is for referencing at other places of the same article, e.g., see Table 1. Table is a *floating* object, i.e. it may not be printed right after this text.  $\LaTeX$  will find a suitable place to put it along with other floating objects like figures. Similar environments as *tabular* below are *array*, *tabbing*. Notice that the *tabular* environment itself is not a floating object, it becomes one when it is embedded in the *table* environment. A caption is not allowed in *tabular*.

Table 1: Optimal weights  $C_k^r$ .

| $C_k^r$ | k=0  | k=1  | k=2  |
|---------|------|------|------|
| r=2     | 1/3  | 2/3  | —    |
| r=3     | 1/10 | 6/10 | 3/10 |

### 3 Equations and Theorems

The `\setcounter` command allows us to re-set the equation counter.

To write one equation,

$$u_t + f(u)_x = 0 \tag{3.1}$$

To write an equation with a two line right-hand-side,

$$u(x, 0) = \begin{cases} u_l & \text{if } x \leq 0, \\ u_r & \text{if } x > 0. \end{cases} \tag{3.2}$$

To write several equation together, use `\eqnarray` or `\align`. The label is used for referencing

these equations as a group. For example, we now can reference the equation by 3.3.

$$\begin{aligned}
 u^{(1)} &= u^n + \Delta t L(u^n) \\
 u^{(2)} &= \frac{3}{4}u^n + \frac{1}{4}u^{(1)} + \frac{1}{4}\Delta t L(u^{(1)}) \\
 u^{n+1} &= \frac{1}{3}u^n + \frac{2}{3}u^{(2)} + \frac{2}{3}\Delta t L(u^{(2)})
 \end{aligned}
 \tag{3.3}$$

We could also have used `\align`. I will give this set of equations another label, since repetition of labels is not permitted.

$$\begin{aligned}
 u^{(1)} &= u^n + \Delta t L(u^n) \\
 u^{(2)} &= \frac{3}{4}u^n + \frac{1}{4}u^{(1)} + \frac{1}{4}\Delta t L(u^{(1)}) \\
 u^{n+1} &= \frac{1}{3}u^n + \frac{2}{3}u^{(2)} + \frac{2}{3}\Delta t L(u^{(2)})
 \end{aligned}
 \tag{3.4}$$

Here is how to write a theorem. Notice that the `Theorem` environment has been defined at the beginning.

**Theorem 3.1** *For the initial value problem . . .*

$$u(\mathbf{x}_0, t_0, \Delta x) = v(\mathbf{x}_0, t_0) + O(\Delta x^r) \tag{3.5}$$

## References

- [1] Helmut Kopka and Patrick W. Daly, *A Guide to L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>*, Second Edition, Addison-Wesley, 1995.
- [2] Leslie Lamport, *L<sup>A</sup>T<sub>E</sub>X, A Document Preparation System*, Second Edition, Addison-Wesley, 1994.