Submitted to the Annals of Applied Statistics

A SAMPLE ARTICLE TITLE

BY FIRST AUTHOR[1,a], SECOND AUTHOR[2,b] AND THIRD AUTHOR[2,c]

[1]*Department, University or Company Name,* [a]*first@somewhere.com*

[2]*Department, University or Company Name,* [b]*second@somewhere.com;* [c]*third@somewhere.com*

The abstract should summarize the contents of the paper. It should be clear, descriptive, self-explanatory and not longer than 200 words. It should also be suitable for publication in abstracting services. Formulas should be used as sparingly as possible within the abstract. The abstract should not make reference to results, bibliography or formulas in the body of the paper—it should be self-contained.

This is a sample input file. Comparing it with the output it generates can show you how to produce a simple document of your own.

1. Introduction. This template helps you to create a properly formatted LaTeX 2_ε manuscript. Prepare your paper in the same style as used in this sample .pdf file. Try to avoid excessive use of italics and bold face. Please do not use any LaTeX 2_ε or TeX commands that affect the layout or formatting of your document (i.e., commands like `\textheight`, `\textwidth`, etc.).

2. Section headings. Here are some sub-sections:

2.1. *A sub-section.* Regular text.

2.1.1. *A sub-sub-section.* Regular text.

3. Text.

3.1. *Lists.* The following is an example of an *itemized* list, two levels deep.

- This is the first item of an itemized list. Each item in the list is marked with a "tick." The document style determines what kind of tick mark is used.
- This is the second item of the list. It contains another list nested inside it.
  - This is the first item of an itemized list that is nested within the itemized list.
  - This is the second item of the inner list. LaTeX allows you to nest lists deeper than you really should.

  This is the rest of the second item of the outer list.
- This is the third item of the list.

The following is an example of an *enumerated* list of one level.

(i) This is the first item of an enumerated list.
(ii) This is the second item of an enumerated list.

The following is an example of an *enumerated* list, two levels deep.

1. This is the first item of an enumerated list. Each item in the list is marked with a "tick." The document style determines what kind of tick mark is used.

Keywords and phrases: First keyword, second keyword.

2. This is the second item of the list. It contains another list nested inside of it.

   (i) This is the first item of an enumerated list that is nested within.

   (ii) This is the second item of the inner list. LaTeX allows you to nest lists deeper than you really should.

This is the rest of the second item of the outer list.

3. This is the third item of the list.

3.2. *Punctuation.* Dashes come in three sizes: a hyphen, an intra-word dash like "U-statistics" or "the time-homogeneous model"; a medium dash (also called an "en-dash") for number ranges or between two equal entities like "1–2" or "Cauchy–Schwarz inequality"; and a punctuation dash (also called an "em-dash") in place of a comma, semicolon, colon or parentheses—like this.

Generating an ellipsis … with the right spacing around the periods requires a special command.

3.3. *Citation.* Simple author and year cite: Billingsley (1999). Multiple bibliography items cite: Billingsley (1999); Bourbaki (1966). Author only cite: Ethier and Kurtz. Year only cite: 1956.

4. Fonts. Please use text fonts in text mode, e.g.:

Roman
Italic
Bold
SMALL CAPS
Sans serif
`Typewriter`

Please use mathematical fonts in mathematical mode, e.g.:

$\mathrm{ABCabc123}$
$\mathit{ABCabc123}$
$\mathbf{ABCabc123}$
$\boldsymbol{ABCabc123\alpha\beta\gamma}$
$\mathcal{ABC}$
$\mathbb{ABC}$
$\mathsf{ABCabc123}$
$\mathtt{ABCabc123}$
$\mathfrak{ABCabc123}$

Note that `\mathcal, \mathbb` belongs to capital letters-only font typefaces.

5. Notes. Footnotes[1] pose no problem.[2]

6. Quotations. Text is displayed by indenting it from the left margin. There are short quotations

> This is a short quotation. It consists of a single paragraph of text. There is no paragraph indentation.

and longer ones.

[1] This is an example of a footnote.

[2] Note that footnote number is after punctuation.

> This is a longer quotation. It consists of two paragraphs of text. The beginning of each paragraph is indicated by an extra indentation.
>
> This is the second paragraph of the quotation. It is just as dull as the first paragraph.

7. Environments.

7.1. *Examples for* `plain`*-style environments.*

AXIOM 1. *This is the body of Axiom 1.*

PROOF. This is the body of the proof of the axiom above. □

CLAIM 2. *This is the body of Claim 2. Claim 2 is numbered after Axiom 1 because we used* `[axiom]` *in* `\newtheorem`.

THEOREM 7.1. *This is the body of Theorem 7.1. Theorem 7.1 numbering is dependent on section because we used* `[section]` *after* `\newtheorem`.

THEOREM 7.2 (Title of the theorem). *This is the body of Theorem 7.2. Theorem 7.2 has additional title.*

LEMMA 7.3. *This is the body of Lemma 7.3. Lemma 7.3 is numbered after Theorem 7.2 because we used* `[theorem]` *in* `\newtheorem`.

PROOF OF LEMMA 7.3. This is the body of the proof of Lemma 7.3. □

7.2. *Examples for* `remark`*-style environments.*

DEFINITION 7.4. This is the body of Definition 7.4. Definition 7.4 is numbered after Lemma 7.3 because we used `[theorem]` in `\newtheorem`.

EXAMPLE. This is the body of the example. Example is unnumbered because we used `\newtheorem*` instead of `\newtheorem`.

FACT. This is the body of the fact. Fact is unnumbered because we used `\newtheorem*` instead of `\newtheorem`.

8. Tables and figures.

Cross-references to labeled tables: As you can see in Table 1 and also in Table 2.

Sample of cross-reference to figure. Figure 1 shows that it is not easy to get something on paper.

9. Equations and the like.

Two equations:

$$C_s = K_M \frac{\mu/\mu_x}{1 - \mu/\mu_x} \tag{1}$$

and

$$G = \frac{P_{\text{opt}} - P_{\text{ref}}}{P_{\text{ref}}} 100(\%). \tag{2}$$

TABLE 1
The spherical case ($I_1 = 0$, $I_2 = 0$)

Equil. points	x	y	z	C	S
L_1	−2.485252241	0.000000000	0.017100631	8.230711648	U
L_2	0.000000000	0.000000000	3.068883732	0.000000000	S
L_3	0.009869059	0.000000000	4.756386544	−0.000057922	U
L_4	0.210589855	0.000000000	−0.007021459	9.440510897	U
L_5	0.455926604	0.000000000	−0.212446624	7.586126667	U
L_6	0.667031314	0.000000000	0.529879957	3.497660052	U
L_7	2.164386674	0.000000000	−0.169308438	6.866562449	U
L_8	0.560414471	0.421735658	−0.093667445	9.241525367	U
L_9	0.560414471	−0.421735658	−0.093667445	9.241525367	U
L_{10}	1.472523232	1.393484549	−0.083801333	6.733436505	U
L_{11}	1.472523232	−1.393484549	−0.083801333	6.733436505	U

TABLE 2
Sample posterior estimates for each model

				Quantile		
Model	Parameter	Mean	Std. dev.	2.5%	50%	97.5%
Model 0	β_0	−12.29	2.29	−18.04	−11.99	−8.56
	β_1	0.10	0.07	−0.05	0.10	0.26
	β_2	0.01	0.09	−0.22	0.02	0.16
Model 1	β_0	−4.58	3.04	−11.00	−4.44	1.06
	β_1	0.79	0.21	0.38	0.78	1.20
	β_2	−0.28	0.10	−0.48	−0.28	−0.07
Model 2	β_0	−11.85	2.24	−17.34	−11.60	−7.85
	β_1	0.73	0.21	0.32	0.73	1.16
	β_2	−0.60	0.14	−0.88	−0.60	−0.34
	β_3	0.22	0.17	−0.10	0.22	0.55

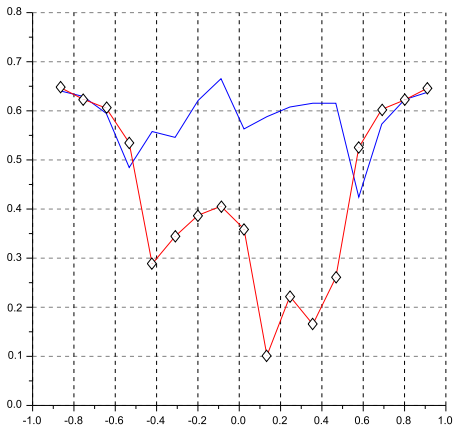

FIG 1. *Pathway of the penicillin G biosynthesis.*

Equation arrays:

$$\frac{dS}{dt} = -\sigma X + s_F F, \tag{3}$$

$$\frac{dX}{dt} = \mu X, \tag{4}$$

$$\frac{dP}{dt} = \pi X - k_h P, \tag{5}$$

$$\frac{dV}{dt} = F. \tag{6}$$

One long equation:

$$\begin{aligned} \mu_{\text{normal}} &= \mu_x \frac{C_s}{K_x C_x + C_s} \\ &= \mu_{\text{normal}} - Y_{x/s}\big(1 - H(C_s)\big)(m_s + \pi/Y_{p/s}) \\ &= \mu_{\text{normal}}/Y_{x/s} + H(C_s)(m_s + \pi/Y_{p/s}). \end{aligned} \tag{7}$$

APPENDICES MUST BE MOVED TO A SUPPLEMENT FILE.

Acknowledgments. The authors would like to thank the anonymous referees, an Associate Editor and the Editor for their constructive comments that improved the quality of this paper.

Funding. The first author was supported by NSF Grant DMS-??-??????.
The second author was supported in part by NIH Grant ???????????.

SUPPLEMENTARY MATERIAL

Title of Supplement A
Short description of Supplement A.

Title of Supplement B
Short description of Supplement B.

REFERENCES

BILLINGSLEY, P. (1999). *Convergence of Probability Measures*, 2nd ed. Wiley, New York.

BOURBAKI, N. (1966). *General Topology* **1**. Addison–Wesley, Reading, MA.

ETHIER, S. N. and KURTZ, T. G. (1985). *Markov Processes: Characterization and Convergence*. Wiley, New York.

PROKHOROV, YU. (1956). Convergence of random processes and limit theorems in probability theory. *Theory Probab. Appl.* **1** 157–214.