

# Using LaTeX document class sugconf to write your paper

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**Abstract**     **Description:** SAS® software international conference, SAS Global Forum (SGF), now accepts papers written with the L<sup>A</sup>T<sub>E</sub>X document preparation system which produces a .pdf.

**Purpose:** This paper illustrates use of the LaTeX document class sugconf, shows a basic paper template and provides references to basic and advanced usage of LaTeX.

**Audience:** SAS user group authors, particularly those using Jupyter Notebook

**Keywords:** document preparation, markup language, ods latex, typesetting, text (.tex) to .pdf

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## Introduction

### Overview

Donald Knuth (1978) developed the T<sub>E</sub>X typesetting software in order to typeset complex mathematical formulas.

Leslie Lamport (1984) wrote a set of macros known as L<sup>A</sup>T<sub>E</sub>X which provided the basic markup for document production.

T<sub>E</sub>X and L<sup>A</sup>T<sub>E</sub>X are *markup* languages. A document consists of two parts: content: what the reader sees, and structure: what the markup language uses for organizing the pages in and of the document. Markup is concerned with standardizing the structure.

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### SAS

In SAS macro language there are two kinds of macro usage: macro variables and macro definitions.

Macro variables are allocated or (re-)assigned with the statement:

```
%let mvar = value;
```

References to macro variables are preceded by ampersand:

```
&mvar %put &mvar;
```

Macro definitions are allocated with the pair of statements:

```
%macro xyz(parm(s)); ... %mend;
```

References to macro definitions are preceded by percent sign:

```
%xyz(parm(s))
```

---

### LaTeX

TeX and LaTeX call their macros *command strings*.

Backslash is the special character used in allocation and reference.

Command strings are allocated with the statement:

```
\new: \newcommand\xyz{text.0}
```

To reassign a command, use

```
\renew: \renewcommand\xyz{text.1}
```

References to command strings are preceded by a backslash:

```
\xyz width=\textwidth
```

Command strings may be assigned with parameters:

```
\fx[n] \newcommand\fx[2]{text #1, text #2}
```

References to command strings with parameters

are written with the parameters enclosed in curly brackets:

```
\fx{z} \section{Abstract}
```

References to command strings with optional parameters

are written with the options enclosed in square brackets:

```
\fx[y]{z} \includegraphics[width=0.5\textwidth]{banner-sgf-2021.png}
```

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## The basics

### Overview

This is the overview, which consists of a list of topics in this section.

- document skeleton
  - document class article
  - command strings for maketitle
  - comparison of maketitle
- 

### document, skeleton

This document skeleton shows the four required elements of a document to be typeset.

```
\documentclass{?}%article, book, report, ..., sugconf
\begin{document}
text
\end{document}
```

The *preamble* consists of the single statement `\documentclass`, which defines the structures to be used. In other languages the `\documentclass` command is similar to a *configuration* (SAS), initialization, or standard library. The second and fourth statements `\begin{document}` and `\end{document}` are the *environment* of the text to be typeset.

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### doc class, article

This example shows a simple template of the article class.

```
% name: my-doc-LaTeX-article.tex
\documentclass{article}
\title{My Paper about Typesetting}
\author{R.J. Fehd}
\begin{document}
\maketitle
\tableofcontents
\section{Abstract}
LaTeX is a set of TeX macros
for marking up text documents to be typeset.
\end{document}
```

The first line is a comment with the name of the program; percent sign to the end of the line is a comment, i.e. there is no need for closure as in SAS `/*slash asterisk comment*/`.

In addition to the `\documentclass` command the *preamble* has two command strings — `\title` and `\author` — which are used in the command `\maketitle`.

The command `\section{Abstract}` performs two actions:

**Abstract** is typeset at the left margin in boldface `\textbf` and fontsize `\Large`, and that text is added to the list of items in the `\tableofcontents`.

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**command strings for maketitle**

Class `sugconf` provides these command strings for use in `\maketitle`.

preamble `\sugconfbanner{filename.ext}` filename.ext is a graphics file, e.g.: .jpg, .png  
`\sugconfpapernumber{text}` text is "Paper 999-<conf-year>"

---

Class `sugconf` provides three macro variables for use in the .tex document:

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**comparison**

Figure 1 provides a comparison of the markup and results of classes `article` and `sugconf`.

**Figure 1 comparison of maketitle in classes article and sugconf**

**maketitle: article**

```
%name: hello-world-article.tex
\documentclass{article}
\title{Linear Models}
\author{Jim Goodnight}
\date{January 26, 1976}
\begin{document}
\maketitle
"Hello World"
\end{document}
```

**Linear Models**

**Jim Goodnight**

**January 26, 1976**

"Hello World"

---

**maketitle: sugconf**

```
%name: hello-world-sugconf.tex
\documentclass{sugconf}
\sugconfbanner{banner-sgf-2021.png}%
\sugconfpapernumber{Paper Sugi-76-03}%
\title{SAS Matrix}
\author{John Sall}
\begin{document}
\maketitle
Hello \SASregistered users

% remember this boilerplate
% at end of document:
\SASisRegisteredTrademark
%if applicable: \OtherTrademarks
\end{document}
```

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**Paper Sugi-76-03**

**SAS Matrix**

**John Sall**

Hello SAS® users

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## What LaTeX provides

This is the overview, which consists of a list of topics in this section.

- markup commands
  - multiple authors
  - superscripts: SAS<sup>®</sup> Foobar<sup>™</sup>
  - graphics width
  - cross references: label, pageref, ref
  - environments figure, table
  - lists: description, enumerate, itemize
  - minipage
  - references: thebibliography
  - text font: texttt, verbatim
- 

**markup commands** : special characters of SAS are also special characters in LaTeX

&, %, \_ : `\&mvar`, `\%put`, `under\_line`;

fill : horizontal: `\hfill`, vertical: `\vfill`

font specs :

sizes : `\small`, `\footnotesize`, `\scriptsize`, `\tiny`

styles : `\textit{italic}`, `\textsc{SMALL CAPS}`, `\textsl{slant}`,  
`\texttt{text, monospace}`,

Jupyter : `\input{my-Jupyter-notebook}%.tex`

justify : inside an environment: `{\centering...}`

`\begin{center} ... \end{center}`

**markup commands,  
continued**

new line : `\newline` in lists,

`\\` in `\author`, `\title`, `tabular` environment

page break : `\newpage`

space :

horizontal : `\hspace{width}`: `\hspace{3em}`, `\quad`, `\qquad`

vertical : `\vspace{width}`: `\vspace{2\baselineskip}`,

`\smallskip`, `\medskip`, `\bigskip`; see also `\vfill`

width : `\textwidth`

---

**multiple authors**

`\author{name1 \\ name2 \\ ... nameN }`

The `\author` command may have several authors on separate lines by using double backslash between each name.

This markup for a *newline* may be used in `\title` as well.

The environment `tabular` also uses double backslash for a new line.

---

**superscripts:**

**SAS<sup>®</sup>**

**foobar<sup>™</sup>**

`\textsuperscript{\scriptsize\textregistered}\`

To place the ® symbol after mention of other software use the `\textsuperscript` command. The font size is `\scriptsize`.

The backslash ( \ ) after the close curly bracket is necessary to provide a space after `\textregistered` or `\texttrademark`.

---

**graphics width**

`\includegraphics[width=0.5\textwidth]{banner-conf-year.png}`

The `\includegraphics` command has a required parameter of `{filename.ext}`. Its optional parameters are enclosed in square brackets. Use the `[width=<fraction>\textwidth]` to ensure the graphic fits inside the page.

**note:** The `graphicx` package provides command `\includegraphics`; it is loaded by class `sugconf`.

---

## cross references

`\label{key}`, `\ref{key}`, `\pageref{key}`

LaTeX provides markup to identify and reference sections, figures, tables, etc. The markup `\label{key}` assigns a pair of numbers to *key*.

The text of the *key* may contain any combination of letters, numbers, and ordinary punctuation: period, colon, hyphen, or underscore.

In open text, the first number is the sectional number and the second is the page number of the current sectional unit: `\section`, `\subsection`, etc. Within an *environment*, such as *figure*, or *table*, the first number is the environment number.

The sectional or environment number can be referenced with the `\ref{key}` command.

The page number can be referenced with the `\pageref{key}` command.

usage, in .tex

```
\section{What LaTeX provides}\label{sec:what.latex.provides}
...
As shown in section \ref{sec:what.latex.provides},
    on page \pageref{sec:what.latex.provides} ...
```

---

usage, in .pdf

As shown in section 1, on page 5 ...  
See also the command `\nameref`, section 2, on page 11, which provides the name of this section: What LaTeX provides

## environments figure, table

`\begin{env}` ... `\end{env}`

Two *environments* are provided for large *boxes* of graphics (*figure*) or text in columns (*table*). These boxes are known as *floats* because they are unbreakable — page breaks are not allowed — and may be moved (floated) to maintain that integrity. The position parameter's values are (h,t,b,p).

! → Note that table 1 has been moved to the top of the (next) page, while figure 2 with the position [h] stayed within this explanation.

usage, in .tex

```
\begin{figure}[h]%placement: h=here,t=top,b=bottom,p=separate page
\centering
\includegraphics[width=0.5\textwidth]{banner-sgf-2021.png}
\caption{description of figure}%convention: below the item
\label{fig:test}                %optional
\end{figure}

\begin{table}
\caption{this table is a float}%convention: above the text
\label{tbl:test}
\begin{tabular}{ll}                % columns, justify: left center right
\hline                            % hline: horizontal line
example &                          % ampersand: column separator
        tabular                    %% double backslash: newline
which has & been 'floated' %%
to top   & of page                %% \hline
\end{tabular}
\end{table}
```

usage, in .pdf



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**Figure 2** description of figure

**Table 1 this table is a float**

example	tabular
which has	been 'floated'
to top	of page

**note:** The minipage environment, shown below, also provides an unbreakable box.

**lists**

```
\begin{list} \item... \item... \end{list}
```

Three *environments* are provided for lists: description, enumerate, and itemize.

**Figure 3 environments for lists: description, enumerate, itemize**

description :	<pre>\begin{description} \item[this is] a labeled list \item[descriptors] must be enclosed in square brackets \end{description}</pre>	<pre>                  this is : a labeled list                   descriptors : must be enclosed in                                   square brackets</pre>
---------------	---	---

enumerate :	<pre>\begin{enumerate} \item numbered list \item the second line \end{enumerate}</pre>	<pre>                  1. numbered list                   2. the second line</pre>
-------------	--	--

itemize :	<pre>\begin{itemize} \item bulleted list \item the 2nd item \end{itemize}</pre>	<pre>                  • bulleted list                   • the 2nd item</pre>
-----------	---	---

**minipage**

```
\begin{minipage}{width} ... \end{minipage}
```

The minipage environment provides an unbreakable box. All of the side-by-side examples in this paper are constructed with this method.

```
\begin{minipage}{0.45\textwidth}
left
\end{minipage}
\hfill %horizontal fill with blanks
\begin{minipage}{0.45\textwidth}
right
\end{minipage}
```

## references

```
\begin{thebibliography} \bibitem{key} \end{thebibliography}
```

The basic *environment* for references is `thebibliography`.  
Within the environment are one or more `\bibitem{cite-key}` items.  
Use the markup `\cite{cite-key-n}` to refer to the bibitems.

### Figure 4 environment thebibliography

usage, in .tex `\begin{thebibliography}{9}` %9=n(bibitem); 99 for more than 10

```
\bibitem{example.plain} %\cite{example.plain}: [1]
```

```
\bibitem[ex.lbl]{example.label} %\cite{example.label}: [ex.lbl]
```

```
\bibitem[label]{cite-key}  
Author, (year), "title".  
In: \textit{conference}.  
\textsc{url:} \url{...}.
```

```
\end{thebibliography}
```

See the typeset results for this paper in  
section 2, References, on page 12.

## text font

---

```
\texttt{text}, \begin{verbatim} ... \end{verbatim}
```

Two markups are available to typeset text in typewriter (monospace) font:  
`\texttt{text}` and the *environment* `verbatim`.

! → Remember that SAS special characters of the macro language, ampersand  
and percent, must be preceded by backslash when used in `\texttt`.

```
\texttt{\%put echo: \&=mvar;} %put echo: &=mvar;
```

```
\begin{verbatim}  
%let mvar = value; %let mvar = value;  
%put echo: &=mvar; %put echo: &=mvar;  
\end{verbatim}
```

See also the `fancyvrb` packages on page 10 which provides the `Verbatim`  
environment with options to control the font size of the text.

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## Advanced usage

### Overview

This is the overview, which consists of a list of topics in this section.

- `booktabs` <https://ctan.org/pkg/booktabs>
- `caption` <https://ctan.org/pkg/caption>
- `fancy verbatim` <https://ctan.org/pkg/fancyvrb>
- `hyperref` <https://ctan.org/pkg/hyperref>
- `nameref` <https://ctan.org/pkg/nameref>
- `statrep` <https://ctan.org/pkg/statrep>

### booktabs

Package `booktabs` provides command `\toprule`, `\midrule`, and `\bottomrule` which replace `\hrule` in the `tabular` environment

preamble `\usepackage{booktabs}`

#### Figure 5 environment `tabular`, enhancements

usage, in `.tex`

<code>\begin{tabular}{ll}\hrule</code>	<code>\begin{tabular}{ll}\toprule</code>
<code>a&amp;b\\</code>	<code>a&amp;b\\</code>
<code>c&amp;d\\</code>	<code>c&amp;d\\</code>
<code>\hrule</code>	<code>\midrule</code>
<code>e&amp;f\\</code>	<code>e&amp;f\\</code>
<code>g&amp;h\\</code>	<code>g&amp;h\\</code>
<code>\hrule</code>	<code>\bottomrule</code>
<code>\end{tabular}</code>	<code>\end{tabular}</code>

usage, in `.pdf`

---

<hr/>	<hr/>
a b	a b
c d	c d
<hr/>	<hr/>
e f	e f
g h	g h
<hr/>	<hr/>

Note the difference in the thickness of the top and bottom rules, as well as the extra space above and below the rules.

---

## caption

The caption packages provides an alternative to the figure and table environments which *float*; i.e. the *box* of the illustration may be moved to top or bottom, or even a new page.

If you want your figure or table exactly Here then use this.

```
preamble \usepackage%{caption}%\captionof{figure|table}{...\label{...}}
          [font=bf%
          ,justification=raggedright%
          ,labelsep=quad%colon newline period quad=1em qquad=2em space
          ,singlelinecheck=false]
          {caption}%
```

### Figure 6 environments figure and table, placement=Here

usage, in .tex Figure \ref{sec:fig:xyz}, \nameref{sec:fig:xyz} illustrates

```
\captionof{figure}{example figure: graphic of something%description
\label{sec:fig:xyz}}%note two close curly brackets
          %the label is inside the captionof description
```

Table \ref{sec:tbl:xyz}, \nameref{sec:tbl:xyz} shows

```
\captionof{table}{example table: lookup table as format%
\label{sec:tbl:xyz}}%
```

usage, in .pdf Figure 7, example figure: graphic of something illustrates

### Figure 7 example figure: graphic of something

Table 2, example table: lookup table as format shows

### Table 2 example table: lookup table as format

## fancy verbatim

The markup examples have been shown using the fancyvrb package environment Verbatim, which provides an option to change the fontsize.

Font sizes are: \small, \footnotesize, \scriptsize, and \tiny.

```
preamble \usepackage{fancyvrb}%FancyVrb setup:
          \fvset{frame=bottomline}%topline bottomline lines single
```

```
usage, in .tex \begin{Verbatim}[fontsize=\small]
PROC freq data = sashelp.class;
               tables sex / list missing noprint
               out = work.freq_class_sex;

run;
\end{Verbatim}
```

```
usage, in .pdf PROC freq data = sashelp.class;
               tables sex / list missing noprint
               out = work.freq_class_sex;

run;
```

**note:** To echo programs use \VerbatimInput{filename.sas}.  
For multi-page programs use options firstline and lastline.

```
\newcommand\FileNameExt{proc-freq.sas}
\VerbatimInput[lastline=40]{\FileNameExt}
\newpage
\VerbatimInput[firstline=41,lastline=80]{\FileNameExt}
```

<b>hyperref</b>	<p>Package <code>hyperref</code> provides <code>\href</code> and <code>\url</code>.  <code>href</code> has two arguments: <code>\href{url}text</code>  <code>url</code> has one argument: <code>\url{url}</code></p> <p>preamble None; <code>hyperref</code> is loaded by class <code>sugconf</code>.  usage, in .tex <code>\href{https://ctan.org/}{Comprehensive TeX Archive Network}</code>  <span style="margin-left: 150px;"><code>Comprehensive TeX Archive Network</code></span>  <span style="margin-left: 150px;"><code>\url{https://ctan.org/}</code></span> <span style="margin-left: 100px;"><code>https://ctan.org/</code></span></p>
<b>nameref</b>	<p>The <code>nameref</code> package provides a method to obtain the text of the caption of a figure or table.</p> <p>preamble <code>\usepackage{nameref}</code>  usage, in .tex reference to figure <code>\ref{sec:fig:xyz}</code>,  <span style="margin-left: 100px;"><code>\nameref{sec:fig:xyz}</code>, on page</span>  <span style="margin-left: 100px;"><code>\pageref{sec:fig:xyz}</code></span></p> <p>usage, in .pdf reference to figure 7, example figure: graphic of something, on page 10.</p>
<b>statrep</b>	<p>The <code>statrep</code> package provides two environments and two tags that work together to display your SAS code and results and to generate the SAS program that produces those results.  The two environments (<code>Datastep</code> and <code>Sascode</code>) display SAS code.  The two tags (<code>Listing</code> and <code>Graphic</code>) display SAS output.  These environments are output from ODS latex destination.  See [statrep.cls] and [ODS latex] for usage.</p> <p>preamble <code>\usepackage{statrep}</code>  usage, in .tex <code>\input{my-statrep-output}%.tex</code></p>

---

## Other classes and packages

<b>beamer</b>	<p>The <code>beamer</code> class changes page specifications to landscape to fit one page to screen size, similar to <code>.ppt</code>.  The <code>.tex</code> document (<code>my-doc-as-main.tex</code>) can also be processed to provide an article: <code>my-doc-as-article.pdf</code>.  See the appendix, page 13, for examples.</p>
<b>pdfpages</b>	<p>The <code>pdfpages</code> package provides a method to copy pages from another <code>.pdf</code> (<code>my-doc-as-ppt.pdf</code>) into the document. This is useful for creating a 4-up handout of a beamer presentation: <code>my-doc-as-ppt-4up-handout.pdf</code>.  See the appendix, page 13, for examples.</p>
<b>refart</b>	<p>The <code>reference manual</code> class provides a wide left margin for section titles. The layout is based on Robert E. Horn's Information Mapping® discipline as outlined in his book <i>Mapping Hypertext</i>.  This document was marked up using the <code>refart</code> class.</p>

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**Conclusion** SAS macro language is similar to LaTeX markup; each has a set of special characters which are used to access functions. LaTeX has functions which can typeset the special characters of SAS macro language, ampersand and percent.

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**Recommended reading** LaTeX2e for authors,  
<http://mirrors.ctan.org/macros/latex/base/usrguide.pdf>  
 LaTeX2e-reference-manual.pdf  
<http://tug.ctan.org/info/latex2e-help-texinfo/latex2e.pdf>  
 web pages: <https://latexref.xyz/>  
 The Comprehensive LaTeX Symbol List: Over 14000 symbols listed in tables  
<http://tug.ctan.org/info/symbols/comprehensive/symbols-a4.pdf>

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**References**

	download TeXlive:	<a href="https://tug.org/texlive/">https://tug.org/texlive/</a>
[beamer.cls] A LaTeX class for producing presentations and slides		<a href="https://ctan.org/pkg/beamer">https://ctan.org/pkg/beamer</a>
[booktabs.sty] Publication quality tables in L <sup>A</sup> T <sub>E</sub> X		<a href="https://ctan.org/pkg/booktabs">https://ctan.org/pkg/booktabs</a>
[caption.sty] Customising captions in floating environments		<a href="https://ctan.org/pkg/caption">https://ctan.org/pkg/caption</a>
[fancyvrb.sty] Sophisticated verbatim text.		<a href="https://ctan.org/pkg/fancyvrb">https://ctan.org/pkg/fancyvrb</a>
[pdfpages.sty] Include PDF documents in LaTeX		<a href="https://ctan.org/pkg/pdfpages">https://ctan.org/pkg/pdfpages</a>
[refman.cls] Format technical reference manuals		<a href="https://ctan.org/pkg/refman">https://ctan.org/pkg/refman</a>
[statrep.cls] Displays SAS code and results of running the code via ods latex		<a href="https://ctan.org/pkg/statrep">https://ctan.org/pkg/statrep</a>
[sugconf.cls] SAS(R) user group conference document class.		<a href="https://ctan.org/pkg/sugconf">https://ctan.org/pkg/sugconf</a>
<b>bricolage</b>		
[latex2e-help-texinfo] A reference manual for L <sup>A</sup> T <sub>E</sub> X.		<a href="https://ctan.org/pkg/latex2e-help-texinfo">https://ctan.org/pkg/latex2e-help-texinfo</a>
[latex.org] LaTeX.Community.org		<a href="https://latex.org/forum/">https://latex.org/forum/</a>
[latex-project.org] The LaTeX Project		<a href="https://www.latex-project.org/">https://www.latex-project.org/</a>
[texfaq.org] TeX FAQ		<a href="http://www.texfaq.org/">http://www.texfaq.org/</a>
[TeX User Group] The TeX showcase		<a href="https://tug.org/texshowcase/">https://tug.org/texshowcase/</a>
[ODS latex] Creating Journal Ready Tables with Special Characters Using ODS LaTeX, Steven Feder <a href="https://support.sas.com/resources/papers/proceedings14/2033-2014.pdf">https://support.sas.com/resources/papers/proceedings14/2033-2014.pdf</a> Using SAS and LaTeX to Create Documents with Reproducible Results, Tim Arnold and Warren F. Kuhfeld <a href="https://support.sas.com/resources/papers/proceedings12/324-2012.pdf">https://support.sas.com/resources/papers/proceedings12/324-2012.pdf</a> Professional outputs with ODS LaTeX, Arnaud Dauchy and Solenn Le Guennec <a href="https://www.lexjansen.com/phuse/2008/tu/TU04.pdf">https://www.lexjansen.com/phuse/2008/tu/TU04.pdf</a>		
<b>packages provided by</b> <code>\documentclass{sugconf}</code>		
[graphicx.sty] Enhanced support for graphics		<a href="https://ctan.org/pkg/graphicx">https://ctan.org/pkg/graphicx</a>
[hyperref.sty] Extensive support for hypertext in L <sup>A</sup> T <sub>E</sub> X.		<a href="https://ctan.org/pkg/hyperref">https://ctan.org/pkg/hyperref</a>
[inputenc.sty] Accept different input encodings.		<a href="https://ctan.org/pkg/inputenc">https://ctan.org/pkg/inputenc</a>
[upquote.sty] Show "realistic" quotes in verbatim. change 'single curly quotes' and "double curly quotes" to 'upright' "quotes"		<a href="https://ctan.org/pkg/upquote">https://ctan.org/pkg/upquote</a>
[url.sty] Verbatim with URL-sensitive line breaks.		<a href="https://ctan.org/pkg/url">https://ctan.org/pkg/url</a>

---

---

## Appendix: example document listings

---

### Beamer suite

```
main
%name: my-doc-as-main.tex
%\usepackage{fancyvrb}%\VerbatimInput{proc-freq.sas}
\begin{document}
text
\end{document}

article=sugconf
%name: my-doc-as-sugconf.tex
\documentclass{sugconf}
\usepackage[notheorems]{beamerarticle}
\input{my-doc-as-main}%.tex
\endinput

ppt
%name: my-doc-as-ppt.tex
\documentclass{beamer}
%% Setup appearance: usetheme
\usetheme{Berlin}%banner:top
\usefonttheme{default}
\input{my-doc-as-main}%.tex
\endinput

ppt 4-up handout
%name: my-doc-as-ppt-4up-handout.tex
\documentclass{article}
\usepackage{pdfpages}
\begin{document}
\includepdf[landscape,nup=2x2,pages=-]
{my-doc-as-ppt}%.pdf
\end{document}
```

---

### SAS-user-group-paper-Latex-class-sugconf.tex

```
%name: SAS-user-group-paper-Latex-class-sugconf.tex
\documentclass{sugconf}
\sugconfbanner{banner-sgf-2021}%.png
\sugconfpapernumber{Paper 999-2021}
\title{SAS User Group Sample Paper
using LaTeX class sugconf}
\author{Author 1 name, ABC Corporation %;
%\ %newline
%Author 2 name, DEF Corporation;
%\ %newline
%Author 3 name, GHJ University
}%end author
%to use packages remove % in column.1
%\usepackage{booktabs}%\toprule \midrule \bottomrule
%\usepackage{caption}%\captionof{figure|table}{description\label{x:y:z}}
%\usepackage{fancyvrb}%\VerbatimInput[options]{filename.sas}
%\usepackage{nameref}%\nameref{x:y:z}
%\usepackage{statrep}%\input{my-ods-latex-output}%.tex
\begin{document}\maketitle
\section{ABSTRACT}%(heading 1)
This paragraph includes the first reference to
\SASregistered
software

\tableofcontents\hrulefill%use for rough draft, disable for final

\section{INTRODUCTION}%(heading 1)
This paragraph expands on the abstract.

\section{FIRST MAIN TOPIC}%(heading 1)

\subsection{SUBHEAD A}%(heading 2)

\subsubsection{Subsubhead A.1}%(heading 3)
```

```

Example citations:
\cite{example.plain}
\cite{example.label}
\cite{cite-article}

\newpage %
\section{Environments}

\subsection{Figures, or tables}

\begin{figure}[h]
\begin{center}
graphic here:
%\includegraphics
%[height=12\baselineskip,
% width=0.25\textwidth
% ]%
%{article-hello-world.pdf}
\caption{about this graphic}
\label{fig.1}%optional
\end{center}
\end{figure}

\begin{table}[h]
\centering
\caption{lookup table for ...}
\label{tbl.1}%optional
text here:
\begin{tabular}{lcr}\hline
left & center & right
\\ %newline
\hline
\end{tabular}
\end{table}

\subsection{Lists}

This is a labeled list:

\begin{description}
\item[x] description of x
\item[y] need to know about y
\end{description}

Here is the numbered list:

\begin{enumerate}
\item a
\item b
\end{enumerate}

And last, bulleted:

\begin{itemize}
\item 1
\item 2
\end{itemize}

\subsection{Program listing}
If you need to include source code,
introduce it with a sentence that ends with a colon:

\begin{verbatim}
%let mvar = value;
%put echo: &=mvar;
\end{verbatim}

  use fontsize=small for log
{\small
\begin{verbatim}
echo: &=mvar;
\end{verbatim}
}%end log

use fontsize=(footnotesize | scriptsize | tiny) for listing
{%\footnotesize

```

```

\scriptsize
%\tiny
\begin{verbatim}
WORK.CLASS

Obs   Name      Sex   Age   Height  Weight
  1   Alfred    M    14    69.0    112.5
  2   Alice     F    13    56.5     84.0
  3   Barbara   F    13    65.3     98.0
\end{verbatim}
}%end listing

\section{CONCLUSION}

%\newpage %
\begin{thebibliography}{9}          %9=n(bibitem); 99 for more than 10
\bibitem{example.plain}            %\cite{example.plain}: [1]

\bibitem[ex.lbl]{example.label} %\cite{example.label}: [ex.lbl]

\bibitem[author, year]{cite-article}
Author, (year), "title".
In: \textit{conference}.
\textsc{url:} \url{...}.

\bibitem[book: Xyz]{cite-book}
Author. (publication date),
"Book title" (City, State (abbrev) of publication) :
Publisher name.

\bibitem[SGF.2022]{cite-journal}
Author. (publication date),
"Article title".
Journal title.

\bibitem[LexJansen.com]{cite-website}
%Author
"SAS Conference Proceedings (1976 - present)".
Available at \url{https://www.lexjansen.com/}.

\end{thebibliography}

\section*{Acknowledgments}%* asterisk: not in table.of.contents
\section*{Recommended Reading}
\section*{Author Information}

Your comments and questions are valued and encouraged. Contact the author at:

\begin{tabular}{l@{: }l}
Name & A. B. Programmer \\
%Enterprise & \%(optional) \\
%Phone & 634-5789 \%(optional) \\
E-mail & \url{mailto:abc@corp.com} \\
%Web & \url{} \%(optional) \\
\end{tabular}

\vfill %move to bottom of page
{\footnotesize
\SASisRegisteredTrademark}

\end{document}

```

---