Module- 5

Article and Thesis Preparation

Article Preparation

The templates of article for publishing in journals,proceedings,magazines, etc., vary from publisher to publisher.Many publisher provide their own templates for maintaining uniformity in a volume and an author needs just to insert the contents of

an article in the given template. If not given, authors can prepare articles in their own templates. A number of such LaTeX based standard templates are discussed here.

An Article can be prepared in the document-class of **article** or **amsart**. Generally an article starts with a title[1] and the list of author(s), which are inserted as the arguments of the **\title{}** and **\author{}** commands respectively. The line break command (****), if required, is permissible in the arguments of these two commands. The **\title{}** and **\author{}** commands are activated using the **\maketitle** command in the **document** environment before inserting any content of the article. The **\title{}** and **\author{}** commands can be used either in the preamble or even in the **document** environment, but must be before the **\maketitle** command. If used, the optional command **\date{}** goes along with the **\title{}** and **\author{}** commands. Following the **\maketitle** command, the abstract of the article is inserted in the **abstract** environment[2]. Then the actual contents of the article are inserted through a series of standard formatting, such as **\section{}**, **\subsection{}**, **\subsubsection{}**, **\paragraph{}**, and **\subparagraph{}** commands, as well as other applicable commands and environments discussed up to the previous Hour.

The general format of an article, in both the document-classes of **article** and **amsart**, are shown in Tables 19.4 and 19.5 on the next page, where the differences in the outputs of the two document-classes are clearly visible. The document-class **article** by default prints the compilation date of the article (which is prevented in Table 19.4 through the **\date{}** command with empty argument). The heading of each section and subsection is full-aligned, and its contents are started from a new line. In contrary,

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[1] The **titlepage** option in the **\documentclass[]{}** command produces the title of a document on a separate page.

[2] The **abstract** environment works in the document-classes of **article** and **amsart**, but not in **book**.

Table 19.4 Article in the document-class **article**

LaTeX input	Output

```
% myarticle.tex (in 'article')
\documentclass[a4paper,12pt]{article}
\date{}
\title{My First Article in \LaTeX}
\author{Author's Name and Address}
\begin{document}
\maketitle
%
\begin{abstract}
The article explains ...
\end{abstract}
%
\section{First Section}
First level of numbered section.
\subsection{First subsection}
Second level of numbered section.
\subsubsection{First sub-subsection}
Third and last level of numbered section.
\section{Second Section}
Texts of the second section ...
%
\end{document}
```

My First Article in LaTeX

Author's Name and Address

Abstract

The article explains …

1 First Section

First level of numbered section.

1.1 First subsection

Second level of numbered section.

1.1.1 First sub-subsection

Third and last level of numbered section.

2 Second Section

Texts of the second section …

1

Table 19.5 Article in the document-class **amsart**

LaTeX input	Output

```
% myarticle.tex (in 'amsart')
\documentclass[a4paper,12pt]{amsart}
\title{My First Article in \LaTeX}
\author{Author's Name and Address}
\begin{document}
\maketitle
%
\begin{abstract}
The article explains …
\end{abstract}
%
\section{First Section}
First level of numbered section.
\subsection{First subsection}
Second level of numbered section.
\subsubsection{First sub-subsection}
Third and last level of numbered section.
\section{Second Section}
Texts of the second section …
%
\end{document}
```

MY FIRST ARTICLE IN LaTeX

AUTHOR'S NAME AND ADDRESS

ABSTRACT. The article explains …

1. FIRST SECTION

First level of numbered section.

1.1. **First subsection.** Second level of numbered section.

1.1.1. *First sub-subsection.* Third and last level of numbered section.

2. SECOND SECTION

Texts of the second section …

1

the heading of a section in the document-class **amsart** is center-aligned. Moreover, the contents of the abstract and each subsection are printed in continuation of their headings. On the other hand, the title, author's name and address, and the headings of abstract and sections are always printed in uppercase letters, even if these are inserted in lowercase letters in the LaTeX input file.

The default heading of the **abstract** environment in the document-classes **article** and **amsart** can be changed by redefining the **\abstractname** command in the preamble, e.g., **\renewcommand{\abstractname}{**`Summary`**}** for replacing the heading '`Abstract`' by '`Summary`'.

19.2.1 List of Authors

Tables 19.4 and 19.5 show only one author in the article, which is center-aligned. When the number of authors is more than one, these may be printed one below another, side-by-side, or in any other user-defined format. A format for two authors, printed one below another, is shown Table 19.6.

Table 19.6 Authors in articles one below another

LaTeX input	Output

\author
{
  {\bf `1st author's name`**}**
  `Affiliation`****
  `Address`**\\[**`2mm`**]**
  %
  {\bf `2nd author's name`**}**
  `Affiliation`****
  `Address`
}
	1st author's name
	Affiliation
	Address
	
	2nd author's name
	Affiliation
	Address

Another format is shown in Table 19.7, where three authors are printed

Table 19.7 Authors side-by-side through the **tabular** environment

LaTeX input	**\author**
	{
	  \begin{tabular}[t]{c@{\extracolsep{`30`**mm}}c@{\extracolsep{**`30`**mm}}c}**
	  {\it `Author-1`**}** **&** **{\it** `Author-2`**}** **&** **{\it** `Author-3`**}**
	  `Affiliation` **&** `Affiliation` **&** `Affiliation`****
	  `Address` **&** `Address` **&** `Address`****
	  `e-mail` **&** `e-mail` **&** `e-mail`****
	  \end{tabular}
	}

Output	*Author-1* Affiliation Address e-mail *Author-2* Affiliation Address email *Author-3* Affiliation Address email

side-by-side through the **tabular** environment with three columns. The contents of each column are center-aligned and two columns are separated by extra 30 mm space through the **@{\extracolsep{**`30`**mm}}** command.

A third format is shown in Table 19.8, where the detail of an author is printed

Table 19.8 Author details at the bottom of a page through the \thanks{} command

LaTeX input	Output

```
\documentclass[a4paper,12pt]{article}
\date{}
\title{My First Article in \LaTeX}
\author
{
    Mr.\,X\thanks{X's Address} \and
    Mr.\,Y\thanks{Y's Address}
}
\begin{document}
\maketitle
%
\begin{abstract}
The article explains ...
\end{abstract}
%
\section{Introduction}
Introduction to the problem ...
%
\end{document}
```

My First Article in LaTeX

Mr. X* Mr. Y†

Abstract

The article explains …

1 Introduction

Introduction to the problem …

*X's Address
†Y's Address

1

at the bottom of the page. This is done through the \thanks{} command after the name of each author, where the detail of an author is inserted as the argument of the command. The same effect can be obtained through the \footnote{} command also, instead of the \thanks{} command. The \and command is used between the names of the two authors to separate them by a big gap in the output.

19.2.2 Title and Abstract on Separate Pages

Some publishers may ask to produce title, list of authors and abstract of an article on separate pages, particularly for the review purpose. These can be achieved by using the titlepage and abstract options in the \documentclass[]{} command, i.e., as \documentclass[titlepage,abstract]{article}. The titlepage option instructs \maketitle to produce the title and list of authors on a separate page, while the abstract option instructs to produce the abstract on another separate page.

*19.2.3 Left Aligned Title and List of Authors**

Notice in §19.2.1 that the title and list of authors of an article are always center aligned. Sometime these may need to be left aligned, which can be achieved simply by inserting the following few lines of commands in the preamble:

```
\makeatletter
\def\maketitle
{     {\bf\Large\raggedright \@title} \vskip 5mm
      {\large\raggedright \@author} \vskip 10mm
}
\makeatother
```

where the pair of **\makeatletter** and **\makeatother** commands brackets a command, starting with a '**@**' (commands starting with a '**@**' are LaTeX's internal commands), to work as an ordinary command. The **\raggedright** command here makes **\@title** (title) and **\@author** (list of authors) left aligned. The **\bf**, **\Large** and **\large** are just text formatting commands, while the **\vskip** command is used for creating some vertical blank space after the title and the list of authors.

19.2.4 Articles in Multiple Columns

Many publishers want articles to be produced in multiple columns. The **twocolumn** option in the **\documentclass[]{}** command produces an article in two columns. In the document-class **article**, as shown in Table 19.9, the title and list of authors (i.e., the

Table 19.9 Article in two columns through the **twocolumn** option in **\documentclass[]{}**

LaTeX input

```
\documentclass[a4paper,12pt,twocolumn]{article}
\date{}
\title{My First Article in \LaTeX}
\author{Author's Name and Address}
\begin{document}
\maketitle
%
\begin{abstract}
Abstract of the article ... Abstract of the article ...
\end{abstract}
%
\section{Introduction}
Introduction to the work ... Introduction to the work ...
\end{document}
```

Output

My First Article in LaTeX

Author's Name and Address

Abstract

Abstract of the article … Abstract of the article … Abstract of the article … Abstract of the article …

1 Introduction

Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work …

arguments of \title{} and \author{}) are printed in single-column, and the abstract and other contents of the article are printed in two columns. In the case of the document-class amsart, however, the title and list of authors are also printed in two columns.

Sometime the title, author and abstract may need to be printed in a single column, while the rest of the article in two columns. In that case, instead of the twocolumn option in \documentclass[]{}, the \twocolumn[] command may be used[3]. As shown in Table 19.10, \twocolumn[] is used after \begin{document}, putting the \maketitle command and the abstract environment in [] of \twocolumn[] for printing them in a single column. After \end{abstract}, the \vspace{1.0cm} command is used to leave 1.0 cm vertical blank space before starting the two-column mode.

Table 19.10 Article in two columns through the \twocolumn[] command

LaTeX input

```
\documentclass[a4paper,12pt]{article}
\date{}
\title{My First Article in \LaTeX}
\author{Author's Name and Address}
\begin{document}
\twocolumn
[
    \maketitle
    \begin{abstract}
    Abstract of the article ... Abstract of the article ...
    \end{abstract}
    \vspace{1.0cm}
]
\section{Introduction}
Introduction to the work ... Introduction to the work ...
\end{document}
```

Output

My First Article in LaTeX

Author's Name and Address

Abstract

Abstract of the article … Abstract of the article … Abstract of the article … Abstract of the article … Abstract of the article … Abstract of the article …

1 Introduction

Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work … Introduction to the work …

Note that the \onecolumn[] and \twocolumn[] commands can be used alternatively for producing different parts of a document alternatively in single column and two columns, respectively. However, each of such parts will be produced on a new page even if sufficient blank space is available on the previous page. Therefore, instead

[3]The twocolumn option may be used in \documentclass[]{} if an entire article is to be produced in two columns, while \twocolumn[] may be used if some components, like title, author and abstract, are to be produced in a single column and the rest in two columns.

of using the \onecolumn[] and \twocolumn[] commands alternatively, the process discussed in §4.3.2 on page 30 may be followed for such requirement.

19.2.5 Section-Wise Numbering of Items*

Numbered items (like tables, figures, and equations) in the document-classes report and book are numbered chapter-wise, i.e., the numbering style is composed of two parts – the serial number of the chapter and the serial number of the item, separated by a period (as can be seen in this book). In contrast, in the document-class article, these items are numbered by their serial numbers only, i.e., not preceded by the serial number of the section in which the items belong (the document-class article does not support a chapter). If these items are to be numbered section-wise in the document-class article, the following few lines of commands may be included in the preamble:

```
\makeatletter
\@addtoreset{table}{section}
\@addtoreset{figure}{section}
\@addtoreset{equation}{section}
\makeatother
\renewcommand{\thetable}{\thesection.\arabic{table}}
\renewcommand{\thefigure}{\thesection.\arabic{figure}}
\renewcommand{\theequation}{\thesection.\arabic{equation}}
```

where \@addtoreset{}{} resets its first argument according to the second argument, i.e., to number tables, figures, and equations section-wise when the above codings are applied. By redefining \thetable, \thefigure and \theequation through \renewcommand{}{}, the default numbering styles of tables, figures and equations are altered to those specified as the second argument of \renewcommand{}{}. According to the above coding, each numbering will start with the serial number of the section, followed by a period and then the serial number of the item in an Arabic numeral (due to \thesection, '.' mark, and \arabic{}, respectively). Without \renewcommand{}{} in the above coding, although the items will be numbered section-wise internally, the section numbers will not be visible in the output. Such numbering would be confusing to understand, particularly when they will be referred somewhere, as the same numbering, like `Figure 1` or `Figure 2`, will be repeated in every section. An application of the above coding is shown in §11.4.3 on page 105.

19.2.6 Dividing an Article into Parts*

Sections of an article can be divided into parts through \part{}. Each \part{} generates the label-word '`Part`' followed by a serial number in a uppercase Roman numeral (such as `Part I` or `Part II`), and then prints its argument as the heading of the part.

Although divided into a number of parts, by default the sections of an article will still be assigned continuous serial numbers irrespective of the parts in which they belong. To number the sections part-wise, the following set of commands may be used in the preamble:

```
\makeatletter
\@addtoreset{section}{part}
\makeatother
\renewcommand{\thesection}{\thepart.\arabic{section}}
```

where **\@addtoreset{section}{part}** resets the sections to be numbered part-wise. The **\renewcommand{\thesection}{\thepart.\arabic{section}}** command redefines the numbering of sections (**\thesection**) to be started by the serial of the part (**\thepart**) in which a section belongs, followed by a period (.) and then the serial number of the section in an Arabic numeral (**\arabic{}**). Without **\renewcommand{}{}**, sections under different parts will be numbered in the same way, like `1` or `2`, which would be confusing to understand when a section is referred somewhere. An example of an article, where its sections are divided into parts and numbered part-wise, is shown in Table 19.11.

Table 19.11 Article dividing sections into parts and numbering them part-wise

LaTeX input

```
\documentclass{article}
\makeatletter
\@addtoreset{section}{part}
\makeatother
\renewcommand{\thesection}{\thepart.\arabic{section}}
%
\begin{document}
\part{}\label{part:country}
\section{India}\label{sec:ind}
\subsection{Population of India}\label{sec:indpop}
\subsubsection{Per Capita Income in India}
%
\part{}\label{part:state}
\section{Delhi}\label{sec:del}
\subsection{Population of Delhi}\label{sec:delpop}
%
India is described in \S\ref{sec:ind} of Part~\ref{part:country} ...
Population of Delhi can be found in \S\ref{sec:delpop}.
\end{document}
```

Output

Part I

I.1 India

I.1.1 Population of India

I.1.1.1 Per Capita Income in India

Part II

II.1 Delhi

II.1.1 Population of Delhi

India is described in §I.1 of Part I … Population of Delhi can be found in §II.1.1.