

# 3 Plugins and support

In earlier chapters we have already seen the use of ‘classes’ (document templates), and ‘packages’ (styling add-ons or plug-ins) which add features to your document. Most of the packages can be used with any document class. Both classes and packages are stored in subdirectories of your  $\text{\TeX}$  installation directory.

**Packages:** A  $\text{\LaTeX}$  *package* is a file or collection of files containing extra commands and programming which add new formatting features, or modify those already existing. There are over 6,000 packages, and over 5,000 of them are pre-installed with every full distribution of  $\text{\LaTeX}$ , ready to be used in your documents immediately.

Package files mostly end with the `.sty` filetype (some computers hide this, but it’s there) — they used to be called ‘style files’. Packages may also include other files as well, like fonts or configuration files.

**Classes:** A  $\text{\LaTeX}$  *class* is a special kind of package which provides formatting template features for a whole document. There are over 600 of these, and over 500 of them are pre-installed with  $\text{\LaTeX}$ .

Class files all end with the `.cls` filetype (some computers hide this, but it’s there). Like ordinary packages, classes

may also be distributed with ancillary files, like fonts or configuration files.

To find out if a particular package or class is already installed, type the `kpsewhich` command in a Terminal window (see Appendix 2 starting on page 277); for example to see if the `noto` package (or the Noto font family) or the `scrartcl` class (for the Koma-Script<sup>1</sup> 'article' class) is installed, type:

```
$ kpsewhich noto.sty
/usr/share/texlive/texmf-dist/tex/latex/noto/noto.sty
$ kpsewhich scrartcl.cls
/usr/share/texlive/texmf-dist/tex/latex/koma-script/scrartcl.cls
```

If the class or package is installed, this will tell you where the file is. If you get no response, it means it is not installed.

To find out what other packages are available and what they do, use the [CTAN search page](#) or Graham Williams' comprehensive [package catalogue](#).

## 3.1 Using classes and packages

You should be familiar with this by now from earlier chapters.

### 3.1.1 Using a document class

We've already seen how to do this in section 2.1.1 on page 42: it's the document class name that you put in curly braces in the `\documentclass` line at the start of a L<sup>A</sup>T<sub>E</sub>X document.

```
\documentclass{book}
```

Most classes have *options* (we saw some in use in the Quick Start document in section 1.4 on page 10). The class documentation will explain what they are for and how to use them. Read it!

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<sup>1</sup> Koma-Script is a bundle of alternative classes by Markus Kohm.

### 3.1.2 Using a package

To use a specific package, put its name in the argument of a `\usepackage` command in your Preamble, eg to use the Noto typeface:

```
\documentclass{book}
\usepackage{noto}
\begin{document}
...
\end{document}
```

#### Note

See section 3.2 on page 68 for how to install extra packages that weren't automatically installed with your distribution of TeX.

For another example, to use the `xcolor` package, which lets you typeset in colours (I warned you this was coming!), you would for example type:

```
\usepackage{xcolor}
```

This makes available the `\color` command and many others, and several sets of predefined palettes of colours which you can specify using options.

You can include several package names in one `\usepackage` command by separating the names with commas, and you can have more than one `\usepackage` command.

If the package has options that you want to use, you must give the package its own separate `\usepackage` command, like `geometry` and `xcolor` shown below. How do you know if a package has options and what they are? Read the documentation!

```
\documentclass[11pt,a4paper,oneside]{report}
\usepackage{fontspec,graphicx}
\setmainfont{TeX Gyre Pagella}
\setsansfont{TeX Gyre Adventor}
```

```
\usepackage[svgnames]{xcolor}
\usepackage[margin=2cm]{geometry}
\begin{document}

\title{\sffamily\color{Crimson}Practical Typesetting}
\author{\color{SlateBlue}Peter Flynn}
\date{\color{ForestGreen}January 2022}
\maketitle

\end{document}
```

(Incidentally, don't actually do it this way: it's a very crude and cumbersome way to do colours in titling, and I only did it here for brevity. It's fine for a one-time short document, but it will interfere with running heads if you use them; and if it's for a repeatable style we'll see in Chapter 7 starting on page 195 how it can be automated as part of the `\maketitle` command and kept out of the author's way.)

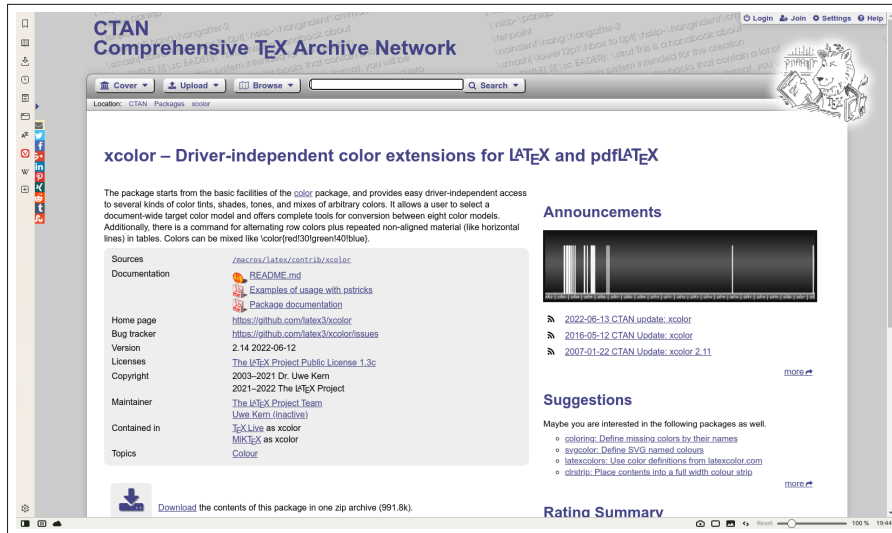
### Exercise 15 – Add colour and change page shape

1. Use the `xcolor` package to add some colour to your document. Stick with primary colours for the moment, or read the `xcolor` documentation to see all the named colours available.
2. Use the `geometry` package to change the margins.
3. Reprocess and print your document if you have a colour printer (monochrome printers should print it in shades of grey).

The `geometry` package has options to let you specify margins, page and paper sizes, header and footer depths, and a lot of other page-geometry dimensions. The `xcolor` package has options to let you specify which of several standard palettes of colours you want to use.

It's really important to read the documentation for the package concerned to find out what can be done and how to do it: see section 3.1.3 on the facing page.

Figure 3.1 – The CTAN page for a package (xcolor)



### 3.1.3 Package documentation

To find out what commands a package provides (and thus how to use it), you need to read the documentation. The simplest way is to search the web for CTAN followed by the package name. The top link should be the package folder on CTAN where you can click on the PDF where it says **Package documentation** (see below).

Alternatively, use your terminal (command) window and type `texdoc` followed by the package name. This will open the documentation in your PDF viewer. You could also use your system's file finder to look for the package name — it should turn up the package directory itself as well as the documentation directory — what you're looking for is a PDF document.

If that doesn't find it, in the `texmf/doc/latex` directory of your installation there should be subdirectories of `.pdf` files, one for every package installed, which you can view or print. If your installation did not include the documentation, it's all on CTAN in [www.ctan.org/pkg/](http://www.ctan.org/pkg/) followed by the package name.

Before using a package, you should read the documentation carefully, especially the subsection usually called 'User Interface',

which describes the commands the package makes available. You cannot just guess and hope it will work.

See the next section for details of how to generate the documentation for additional packages you install yourself.

### Exercise 16 – Read all about it

1. Find and view (or print) the documentation on the `xcolor` package you used in Exercise 15 on p. 66.
2. Find and view (or print) the documentation on the `geometry` package you used in Exercise 15 on p. 66.
3. Browse some of the other package documentation installed on your system.

## 3.2 Installing extra classes and packages

You will not need this section if...

- ...you are using MiKTeX, which has a package auto-installer (also applies to ProTeXt);
- ...you are using a system which has the TeX Live Package Manager `tlmgr` and you have been using it to keep your system up to date.

This section is for people who have neither MiKTeX nor `tlmgr`, and for those occasions when you need to install an extra, private, experimental, or non-standard package that cannot be installed automatically, or one that is on CTAN but not included in your distribution.

When you try to typeset a document which requires a package which is not installed on your system, L<sup>A</sup>T<sub>E</sub>X will warn you with an error message that it is missing (see section B.3.3.7 on page 287). You then need to download the package and install it using the instructions in section 3.2.

Some T<sub>E</sub>X distributions can now catch this error, and will download and install the missing class or package for you right there and then, and carry on typesetting as if it had always been there. Currently the best known implementation of this feature is in the MiK<sub>T</sub>E<sub>X</sub> distribution for Microsoft Windows (also part of the ProT<sub>E</sub>Xt distribution which is based on it).

In other systems there is the T<sub>E</sub>X Live Package Manager (*tlmgr*), which can download and install packages for you, but not in the middle of a L<sup>A</sup>T<sub>E</sub>X run: you have to stop and run it separately. The *tlmgr* program is not yet available in all distributions of L<sup>A</sup>T<sub>E</sub>X, so check your documentation to see if it is working in your version.

(Package Managers like these can also download updates to packages you already have, both the ones that were installed along with your version of L<sup>A</sup>T<sub>E</sub>X as well as ones you have added. Updates occur when a class or package author finds and fixes a bug, or adds a new feature. All package updates on CTAN are automatically announced on the Usenet newsgroup [comp.text.tex](#).)

There is no limit to the number of packages you can have installed on your computer (apart from disk space). There is probably a limit to the number that can be used inside any one L<sup>A</sup>T<sub>E</sub>X document at the same time, although it may depend on how big each package is. In practice there is no problem in having even a few dozen packages active (this document uses over 250 of them).

The [Comprehensive T<sub>E</sub>X Archive Network \(CTAN\)](#) is a repository of T<sub>E</sub>X and related software from [HyperText Transfer Protocol \(HTTP\)](#) and [File Transfer Protocol \(FTP\)](#) servers worldwide. It contains copies of almost every piece of free software related to T<sub>E</sub>X and L<sup>A</sup>T<sub>E</sub>X, and especially, all the public packages and classes.

Private, experimental, or non-standard packages are normally stored on their author's server, or on a shared resource like GitHub. To use these, you must get the URI of the download page.

(By unfortunate historical accident, both classes and packages are usually managed and stored on CTAN in the same file format (DocT<sub>E</sub>X: a [.dtx](#) filetype) and are referred to generically as

'packages' even though some of them contain classes. We have to live with this.)

### Always try CTAN first

CTAN should *always* be your first port of call when looking for a software update or a class or package you want to use and don't have installed. To help prevent overload on the volunteers, please don't ask in the [network help resources](#) until you have checked CTAN and the [FAQ](#) (section 3.3.3 on page 80) first.

CTAN is based on three main servers but if you go to [www.ctan.org/](http://www.ctan.org/) to start with, you will be redirected to your nearest mirror server for downloads.

## 3.2.1 Downloading packages

CTAN packages are available as `.zip` files from any CTAN server.

- some are in TDS format, which is the same directory layout as your T<sub>E</sub>X installation, so it is faster and easier to use because it unzips directly into your Personal T<sub>E</sub>X Directory;
- others are just zip files with no directory structure in them: after unzipping, you have to move the files to 'The Right Places' yourself;
- if you prefer, you can download all the needed files one by one and move the files to 'The Right Places' yourself.

### 3.2.1.1 Downloading a TDS package zip file

If you go to a package's CTAN page (<http://ctan.org/pkg/name>) this will show the package details, and if the package is available in TDS format, there will be a link labelled 'TDS archive' with a file ending in `.tds.zip`.

Download this and unzip it straight into your Personal T<sub>E</sub>X Directory, where L<sup>A</sup>T<sub>E</sub>X will find it first, overriding any other version



## The T<sub>E</sub>X Directory Structure

The T<sub>E</sub>X Directory Structure (TDS) is the set of folders and sub-folders used by all modern distributions of T<sub>E</sub>X and L<sup>A</sup>T<sub>E</sub>X so that there are known, fixed places where files are stored. The TDS is documented at [www.tug.org/tds/](http://www.tug.org/tds/).

that is installed. The location of your Personal T<sub>E</sub>X Directory is described in section A.3 on page 263.

MiK<sub>T</sub>E<sub>X</sub> (and ProT<sub>E</sub>Xt) users must also run the Refresh FNDB function (see 3. on page 266).

### 3.2.1.2 Downloading a non-TDS package zip file

If there is no TDS zip file, there will be a prominent link at bottom right labelled 'Download the contents of this package in one zip archive' (see the bottom of Figure 3.1 on page 67).

1. Download the zip file to a **temporary directory**. Mac and Linux systems already have a `/tmp` directory for this purpose. On Windows, create a folder for this purpose like `Computer\System\Users\your name\temp` (or just use `C:\tmp` or `C:\temp`).<sup>2</sup>
2. Unzip the file into the `tex/latex` folder of your Personal T<sub>E</sub>X Directory. It will create a new subfolder in there called after the package name, and put all the package files in it. You can delete the zip file from the temporary directory afterwards as it is no longer needed.

Font packages need to be unzipped into `tex/fonts` instead; otherwise the procedure is the same;

<sup>2</sup> MiK<sub>T</sub>E<sub>X</sub> users note that you cannot process T<sub>E</sub>X Installer (`.ins` and `.dtx`) files inside MiK<sub>T</sub>E<sub>X</sub>'s own installation folders: you have to process them elsewhere first, hence the need for a temporary directory.

3. For classes and style packages, you MUST complete installation by extracting the `.cls` or `.sty` file[s] as shown in section 3.2.2 on the next page.
4. Ancillary files such as documentation, and (for font packages) the font files, need to be moved to 'The Right Place' (see Table 3.1 on page 76).

### 3.2.1.3 Manual download

If there is no `.zip` file at all, as will usually be the case off-CTAN and for private packages, what you need to look for is almost always *two files*, one ending in `.dtx` and the other in `.ins`. The first is a DOCT<sub>E</sub>X file, which combines the package programs and their documentation in a single file. The second is the installation program (much smaller). You MUST always download *both* these files, if they exist (and maybe others in the download folder). There are two exceptions noted in below.

### 3.2.1.4 Other package downloads

If neither the two files nor the package `.zip` are there, it means one of two things:

- Either* the package is part of a much larger *bundle* which you SHOULD NOT update yourself unless you are updating your entire L<sup>A</sup>T<sub>E</sub>X system;<sup>3</sup>
- or* it's one of a growing number of packages supplied as a single `.dtx` file alone (no `.ins`);
- or* it's one of a few rare or unusual packages still supplied as a single hand-made `.sty` or `.cls` file possibly written for the now obsolete L<sup>A</sup>T<sub>E</sub>X 2.09,<sup>4</sup> or perhaps by an author who has a doctrinal or philosophical objection to using DOCT<sub>E</sub>X.

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<sup>3</sup> For example, there is no separate `xcolor.dtx` and `xcolor.ins` for the `xcolor` package because it forms part of the `graphics` bundle, which is included with all L<sup>A</sup>T<sub>E</sub>X systems anyway. Such packages change very rarely, as they form part of the kernel of L<sup>A</sup>T<sub>E</sub>X and are very stable. You should never try to update these packages in isolation.

<sup>4</sup> Almost all of these have been updated to work with L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>, so they should be installed as in step 3. on page 74, but there are a few remaining.

### Warning

On Unix-based systems (including Mac OS X and GNU/Linux), all you need to do is unzip the TDS zip file into your Personal T<sub>E</sub>X Directory. On Windows systems running MiK<sub>T</sub>E<sub>X</sub>, you MUST reindex your File Name Database (FNDB) (see step 4. on page 75) before L<sup>A</sup>T<sub>E</sub>X will be able to find the new files.

## 3.2.2 Installing a class or package manually

There are four steps to installing a non-TDS L<sup>A</sup>T<sub>E</sub>X class or package:

### 1. Extract the class or package files from the .dtx/.ins files

Use your directory browser or file manager (eg *My Computer*, *Finder*, *Thunar*, *Dolphin*, etc) to find the subfolder in your Personal T<sub>E</sub>X Directory below `tex/latex` into which you unzipped or downloaded the package file[s].

Run L<sup>A</sup>T<sub>E</sub>X on the `.ins` file. That is, open the file in your editor and process it as if it were a L<sup>A</sup>T<sub>E</sub>X document (which it is), or if you prefer, type `latex` followed by the `.ins` filename in a command window in the directory where the file is.

This will extract all the files needed from the `.dtx` file (which is why you must have both of them present in the directory).

### Warning

If this is a non-TDS zip file, or individually-downloaded files, note down or print the names of the files created if there are a lot of them (read the log file if you want to see their names again).

### 2. Create the documentation if not already done

Some packages come with the PDF documentation already there. If so, ignore this step.

To [re]create the PDF documentation, run  $\LaTeX$  on the `.dtx` file *twice*. This will create a `.pdf` file of documentation explaining what the package is for and how to use it. Two passes through  $\LaTeX$  are needed in order to resolve any internal crossreferences in the text. If there is a  $\text{BIB}\TeX$  file of references, or if you need the Index, you will need to process *bibtex*, *biber*, *makeindex*, or other ancillary programs. I *very strongly recommend* doing this with the `Build` menu of your editor, or with the *latexmk* tool.

### 3. Install the files if needed

This step is only needed if you unzipped and processed the file in some other location (eg your temporary directory), or if the processing extracted more than just the `.cls` or `.sty` file. Other types of files belong in different places in the TDS.

Move the files created in step 1. on the previous page to the right subdirectories in your Personal  $\TeX$  Directory as shown in Table 3.1 on page 76. *Always* put the files in subdirectories of your Personal  $\TeX$  Directory, *a*) to prevent your new package accidentally overwriting master files in the main  $\TeX$  directories; and *b*) to avoid your newly-installed files being overwritten when you next update your version of  $\TeX$ . Never, *never*, NEVER put files into your  $\TeX$  distribution's main directory tree. If you are a system administrator updating a shared system, however, you SHOULD put the files into the *local* (shared)  $\TeX$  directory tree.

'The Right Place' sometimes causes confusion, especially if your  $\TeX$  installation is old or does not conform to the TDS. For a TDS-conformant system, 'The Right Place' is your Personal  $\TeX$  Directory tree unless you are a systems manager updating a shared machine, in which case it's the local  $\TeX$  directory tree. Your Personal  $\TeX$  Directory tree is in your home directory (folder):

- Unix & GNU/Linux systems: `~/texmf/`.
- Apple Macintosh OSX: `~/Library/texmf/`.
- Windows systems:

`Computer\System\Users\your_name\texmf` (on obsolete Windows systems you can use `C:\texmf`).

Create this directory if it does not already exist. You will need to create subdirectories within this directory: see Table 3.1 on the following page.

Often there is just a `.sty` file to move but in the case of complex packages there may be more, and they belong in the different locations shown in Table 3.1 on the next page. It is important to create a subdirectory for the package within your *Personal T<sub>E</sub>X Directory*, rather than dump the files into `misc` along with other unrelated stuff.

#### 4. Shared systems and MIK<sub>T</sub><sub>E</sub><sub>X</sub>: update your index

On Unix & GNU/Linux systems (including Apple Macintosh OS X) you **MUST NOT** run the T<sub>E</sub>X indexer program or create an `ls-R` database in your *Personal T<sub>E</sub>X Directory*. These systems search your *Personal T<sub>E</sub>X Directory* automatically.

Otherwise:

- Windows MIK<sub>T</sub><sub>E</sub><sub>X</sub> users** (only) **MUST** use the MIK<sub>T</sub><sub>E</sub><sub>X</sub> Administration program to add your new *Personal T<sub>E</sub>X Directory* to MIK<sub>T</sub><sub>E</sub><sub>X</sub>'s search tree when you first create it. After that, each time you update files in there, you **MUST** run the *File Name Database (FNDB)* updater in the MIK<sub>T</sub><sub>E</sub><sub>X</sub> Administration program, otherwise T<sub>E</sub>X will never see your newly-installed files.
- If you are updating a shared system, putting the files into the local T<sub>E</sub>X directory tree, you **MUST** run your T<sub>E</sub>X indexer program afterwards to update the package database. This program comes with every modern version of T<sub>E</sub>X and is variously called *texhash*, *mktexlsr*, or even *configure*, or it might just be a mouse click on a button or menu in your configuration system (like MIK<sub>T</sub><sub>E</sub><sub>X</sub>'s). Read the documentation that came with your installation to find out which it is.

**Table 3.1** – Where in your Personal T<sub>E</sub>X Directory to put files you install manually from packages

Type	Subdirectory of <code>texmf</code>	Description
<code>.afm</code>	<code>fonts/afm/<u>foundry</u>/<u>typeface</u>/</code>	Adobe Font Metrics
<code>.bst</code>	<code>bibtex/bst/<u>packagename</u>/</code>	BIBT <sub>E</sub> X style file
<code>.clo</code>	<code>tex/latex/<u>classname</u>/</code>	Document class options
<code>.cls</code>	<code>tex/latex/<u>classname</u>/</code>	Document class file
<code>.dtx</code>	<code>tex/latex/<u>packagename</u>/</code>	Package DOCT <sub>E</sub> X file
<code>.dvi</code>	<code>doc/<u>packagename</u>/</code>	package documentation
<code>.fd</code>	<code>tex/latex/mfnfss/</code>	METAFONT Font Definition files
<code>.fd</code>	<code>tex/latex/psnfss/</code>	PostScript Type 1 Font Definition files
<code>.fd</code>	<code>tex/latex/<u>typeface</u>/</code>	Other Font Definition files
<code>.ins</code>	<code>tex/latex/<u>packagename</u>/</code>	Package DOCT <sub>E</sub> X installer
<code>.jpg</code>	<code>tex/generic/</code>	JPG images
<code>.log</code>	<code>doc/<u>packagename</u>/</code>	package documentation log
<code>.mf</code>	<code>fonts/source/public/<u>typeface</u>/</code>	METAFONT font outlines
<code>.otf</code>	<code>fonts/opentype/<u>foundry</u>/<u>typeface</u>/</code>	OpenType fonts
<code>.pdf</code>	<code>doc/<u>packagename</u>/</code>	package documentation
<code>.pfb</code>	<code>fonts/type1/<u>foundry</u>/<u>typeface</u>/</code>	PostScript Type 1 outlines
<code>.png</code>	<code>tex/generic/</code>	PNG images
<code>.sty</code>	<code>tex/latex/<u>packagename</u>/</code>	Package (style) file
<code>.svg</code>	<code>tex/generic/</code>	SVG images
<code>.tfm</code>	<code>fonts/tfm/<u>foundry</u>/<u>typeface</u>/</code>	T <sub>E</sub> X Font Metrics
<code>.ttf</code>	<code>fonts/truetype/<u>foundry</u>/<u>typeface</u>/</code>	TrueType fonts
<code>.vf</code>	<code>fonts/vf/<u>foundry</u>/<u>typeface</u>/</code>	T <sub>E</sub> X virtual fonts
others	<code>tex/latex/<u>packagename</u>/</code>	unless instructed otherwise

- Every user SHOULD have a Personal T<sub>E</sub>X Directory to put extra stuff into. Create yours now (see section A.3 on page 263).
- If there are configuration or other files (`.cnf`, `.cfg`, etc), read the documentation to find out if there is a special or preferred location to move them to.

## On MIKTeX and shared systems

In these installations, you MUST run your TeX indexer program after making changes. See step 4. on page 75 for details.

This step is *essential*, otherwise none of your changes will work.

## Files in your working folder

It is possible just to unzip package files into your current working folder, where your document is, because L<sup>A</sup>T<sub>E</sub>X will look there first, before looking in your [Personal TeX Directory](#) or anywhere else, but it means that if you use L<sup>A</sup>T<sub>E</sub>X in a different folder for another document, you'll have to copy all the packages you put in there. Far better to put them all in The Right Place to start with: your [Personal TeX Directory](#).

The *tlmgr* auto-updater is widely used in *TeX Live* systems *except* where TeX has been installed from Debian-based Unix *system* packages. On Windows and Apple Mac, and on Unix systems where *TeX Live* has been installed from the TUG DVD or download, *tlmgr* is the normal way to update packages. The manual process described above is *only* for those cases where *tlmgr* cannot be used.

This includes the thousands of installations which do not conform to the TDS, such as old shared Unix systems and some Microsoft Windows systems, so there is no way for an installation program to guess where to put the files: *you* have to know this yourself. There are also systems where the owner, user, or installer has chosen *not* to follow the recommended TDS directory structure, or is unable to do so for policy or security reasons (such as a shared system where she cannot write to a locked disk or directory).

The local `texmf` directory (usually called `texmf-local` or `texmf.local`) is a place for local modifications *on a shared or managed multi-user system* (such as a server) which will override but otherwise not interfere with the main  $\TeX$  installation directory. Your installation should already be configured to look in the personal and local directories first, so that any updates to standard packages will be found there *before* the copies in the main `texmf` or the local `texmf` tree. All modern  $\TeX$  installations do this, but if not, you can edit `texmf/web2c/texmf.cnf` (or on a shared system, ask your systems manager or support person to do so). There is an example in section A.6 on page 273.

### Exercise 17 – Install a package

1. Download and install the latest version of the `enumitem` package.

This implements inline lists, among many other extra features for list formatting.

### 3.2.3 Creating the TDS structure

If you have a  $\TeX$  distribution which has an auto-updater like  $\TeX$  Live (`tlmgr`) or MiK $\TeX$ , you'll probably never have to update a package manually, so you won't need this section unless you want to install something from outside CTAN such as a private, corporate, or commercial package or a typeface.

The  $\TeX$  Directory Structure (TDS) means you can make the subdirectory structure of your Personal  $\TeX$  Directory the same as that of your main  $\TeX$  installation. This way you can have all the branches of the tree you need ready for future use.

If you install packages or fonts using a TDS zip file (see section 3.2.1.1 on page 70), this is the directory structure that will be used: look at the subdirectories of `texmf/tex/latex/` and `texmf/fonts/` in your main  $\TeX$  installation for examples. L $\TeX$



will always use a package or font in your Personal T<sub>E</sub>X Directory before looking elsewhere.

On Unix & GNU/Linux systems (including Apple Macintosh OS X) it is straightforward to recreate the entire subdirectory structure ready for use. using the commands in Exercise 18 on p.??

### Exercise 18 - Replicating the TDS

1. Find the installation directory of your main T<sub>E</sub>X distribution:

```
$ find / -type d -name texmf-dist 2>/dev/null
```

2. Change to that directory:

```
$ cd/usr/share/texlive/texmf-dist
```

(using whatever directory the first command identified);

3. Replicate its subdirectories:

```
$ find . -type d -exec mkdir -p ~/texmf/{} \;
```

On a Mac, use `~/Library/texmf` instead of `~/texmf`.  
The operation may take a minute to complete.

Windows appears to provide no way of doing this, but it may be possible using a *Powershell* script; or you could install *Cygwin*, which provides you with the standard Unix tools in a Command window.

## 3.3 Where to go for help

The indexes and documentation files in your T<sub>E</sub>X installation and on CTAN are the primary online resource for self-help on specific packages, and you should read these carefully before asking questions about packages.

### 3.3.1 Beginners start here

A very valuable list of Dos and Donts is maintained on [StackExchange](#) listing the most common mistakes that newcomers make. Once you've got started with L<sup>A</sup>T<sub>E</sub>X, especially if you have learned it informally from colleagues, it's worth having a look at this just to make sure you avoid the easiest pitfalls.

If you haven't used online help before, please read Eric Raymond's advice in *How To Ask Questions The Smart Way* (Raymond 2014) which will save you and the people who answer you a lot of time.

### 3.3.2 The Minimal [Non-]Working Example or MWE

If you want to send an example of what you're trying to do to one of the forums, mailing lists, or newsgroups listed here, you MUST send an [Minimal \[Non-\]Working Example \(MWE\)](#). This is your L<sup>A</sup>T<sub>E</sub>X document pared right down to the bare metal: remove *all* non-relevant packages, *all* non-relevant commands and formatting, and send *ONLY* the absolute bare minimum necessary to show what doesn't work. Unless you do this, you are wasting everyone's time, including your own.

There is an excellent article by Nicola Talbot at [tug.ctan.org/info/dickimaw/dickimaw-minexample.pdf](http://tug.ctan.org/info/dickimaw/dickimaw-minexample.pdf) which explains the procedure in fine detail (Talbot 2014).

And guess what? While doing this, you often find you discover for yourself what the problem was, saving you and thousands of others the trouble of working it out afresh!

### 3.3.3 The FAQ

For general queries you should read the [Frequently-Asked Questions \(FAQ\)](#) document so that you avoid wasting your time and others' by asking about things for which there is already an easily-accessible answer.

### 3.3.4 StackExchange

The web site [tex.stackexchange.com](http://tex.stackexchange.com) is a carefully-managed and well-structured question-and-answer site for T<sub>E</sub>X and L<sup>A</sup>T<sub>E</sub>X.

You can vote answers up or down according to their quality or usefulness, but there are strict rules about how you ask questions, the same as for [comp.text.tex](#) below.

### 3.3.5 Discord

The [Discord web site](#) and the associated app (most devices) is a chat and discussion system originally aimed at the gaming community, but it now has a very active and useful server for T<sub>E</sub>X and L<sup>A</sup>T<sub>E</sub>X.

### 3.3.6 The T<sub>E</sub>Xhax mailing list

Another support resource is the mailing list [T<sub>E</sub>Xhax](#). Again, feel free to ask questions, but again, try to answer the question yourself first (and say what you've tried in your message).

### 3.3.7 TUG and other web sites

T<sub>E</sub>X Users Group (TUG), as well as most local user groups, maintains a web site ([www.tug.org](http://www.tug.org)) with lots of information about various aspects of the T<sub>E</sub>X system and details of support groups, conferences, and journals in many languages and cultures. See Appendix 3 starting on page 289 for information on joining TUG.

### 3.3.8 Usenet News

The Usenet newsgroup [comp.text.tex](#) is the principal forum for other questions and answers about T<sub>E</sub>X and L<sup>A</sup>T<sub>E</sub>X, as well as the principal place where new CTAN packages are announced.

There is a very detailed guide to how to get the best out of asking questions on Usenet at [www.catb.org/esr/faqs/smart-questions.html#intro](http://www.catb.org/esr/faqs/smart-questions.html#intro).

To access Usenet news, type `news:comp.text.tex` into your browser's 'Location' or 'Address' window. If your browser doesn't support Usenet news, install one of the many free newsreaders<sup>5</sup>

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<sup>5</sup> Note that this means newsreaders for the Usenet News (Network News Transfer Protocol (NNTP)) service. It does *not* mean readers for Really Simple Syndica-

### Note

Feel free to ask questions, but please do not ask frequently-asked questions: read the [FAQ](#) instead. The people who answer the questions do so voluntarily, unpaid, and in their own time. It is also important that for specific queries you include a [Minimal \[Non-\]Working Example](#) — a very short whole  $\LaTeX$  file that others can download and typeset, to see exactly what your problem is.

from the list at [en.wikipedia.org/wiki/List\\_of\\_Usetnet\\_newsreaders](https://en.wikipedia.org/wiki/List_of_Usetnet_newsreaders)). Google Groups also provides access to Usenet newsgroups ([groups.google.com/g/comp.text.tex](https://groups.google.com/g/comp.text.tex)), but it is a web interface, not a newsreader in the normal sense of the word, and lacks most of the normal features of a newsreader.

### 3.3.9 Google $\LaTeX$ list

There is a Google Groups mailing list for  $\LaTeX$  users at [groups.google.com/group/latexusersgroup](https://groups.google.com/group/latexusersgroup).

### 3.3.10 Commercial support

If you need commercial levels of support, such as a 24-hour phone contact, or macro-writing services, you can contact a consultancy which deals with  $\TeX$  (details are on the [TUG Web site](#) and in issues of TUGboat).

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tion (RSS) feeds, which are a different thing entirely — these are unfortunately also sometimes referred to as ‘newsreaders’.