LaTeX for UEA Administrative Work

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Abstract

This document is aimed at lecturers and administrative support staff who need to use LaTeX to typeset exam papers, assignments, correspondence etc. If you are unfamiliar with LaTeX I would recommend that you first read *LaTeX for Complete Novices*[1].

[1] http://theoval.cmp.uea.ac.uk/~nlct/latex/novices/

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Chapter 1

Introduction

There is an increasing pressure on lecturers and administrative support staff to learn to typeset documents in LaTeX, as equation editors in word processors tend not to be up to the standards required for typesetting examination questions etc. Also, many journals whose publications involve a lot of mathematics, tend to prefer submissions created in LaTeX. This document gives examples on how to use the following LaTeX 2_ε class files or packages: uealettr (Correspondence), csvtools (Mail Merging), ueaexam (Examination Papers), ueatest (Course Test Papers), ueaassig (Assignments), marksheet (Coursework coversheets) and probsoln (Generate Problem Sheets from a Database). These files can all be downloaded from http://theoval.cmp.uea.ac.uk/~nlct/latex/packages/

The examples used in this document can be downloaded from http://theoval.cmp.uea.ac.uk/~nlct/latex/admin/examples/.

Chapter 2

Writing Correspondence Using uealettr

The uealettr[1] class file is designed for writing letters with or without headed paper. Multiple letters can be contained in the same file, with each letter enclosed in the `letter` environment. This environment takes one mandatory argument which should be the name and address of the recipient.

Within the `letter` environment, the following commands may be used:

`\opening{`*text*`}`	The opening salutation, e.g. `\opening{Dear Sir}`
`\closing{`*text*`}`	The closing text, e.g. `\closing{Yours Faithfully}`
`\cc{`*text*`}`	Indicates to whom the letter should be copied, e.g. `\cc{Dr A. N. Other\\Prof A. Person}`.
`\encl{`*text*`}`	Indicates any enclosures, e.g. `\encl{Application Form\\Map}`
`\ps`	All text from this point on until the end of the `letter` environment is treated as a postscript, e.g. `\ps P.S. Prompt attendence would be appreciated.`

You can specify the sender's information using the following commands in the preamble:

`\signature{`*text*`}`	The sender's name, e.g. `\signature{Dr Nicola Talbot}`
`\location{`*text*`}`	The sender's location (which will usually be the school), e.g. `\location{School of Computing Sciences}`
`\division{`*text*`}`	The division within the school, e.g. `\division{Kernel Support Group}`
`\telephone{`*text*`}`	The main telephone number. e.g. `\telephone{01603 123456}`
`\directdial{`*text*`}`	The sender's direct dial number. e.g. `\directdial{01603 654321}`
`\fax{`*text*`}`	The sender's fax number. e.g. `\fax{01603 456789}`
`\email{`*text*`}`	The sender's email address. e.g. `\email{sample@cmp.uea.ac.uk}`
`\myref{`*text*`}`	The sender's reference. e.g. `\myref{admission/jones/2004}`
`\yourref{`*text*`}`	The recipient's reference. e.g. `\yourref{interview/smith/2004}`
`\subject{`*text*`}`	The subject of the correspondence. e.g. `\subject{Interview}`

Here is an example:

†Code

```
\documentclass{uealettr}

% Sender details

\signature{Dr Nicola Talbot}
\division{\LaTeX\ Support Group}
\location{School of Computing Sciences}
\telephone{01603 456161}
```

[1] http://theoval.cmp.uea.ac.uk/~nlct/latex/packages/index.html#uealettr

```
\directdial{01603 592847}
\fax{01603 593345}
\email{example@cmp.uea.ac.uk}

% Letter details
\subject{Sample Letter}
\myref{latex/uealettr}
\yourref{a/query}

\begin{document}

% This is the letter
\begin{letter}{Prof Some One\\1 The Street\\The Town\\
The County\\AB1 2XY}

\opening{Dear Prof Some One}

This is a sample letter.  I hope you find it interesting.

\closing{Yours Sincerely}

\cc{Dr A. N. Other\\Prof A. Person}

\encl{Map of the university}

\ps P.S. here's a postscript.

\end{letter}

\end{document}
```

↓Code

The resulting output is shown in Figure 2.1.

The sender details usually remain the same, so it's probably easier to put them in a separate file, and store it somewhere on TEX's search path. For example, the file `sender.tex` might look like:

↑Code

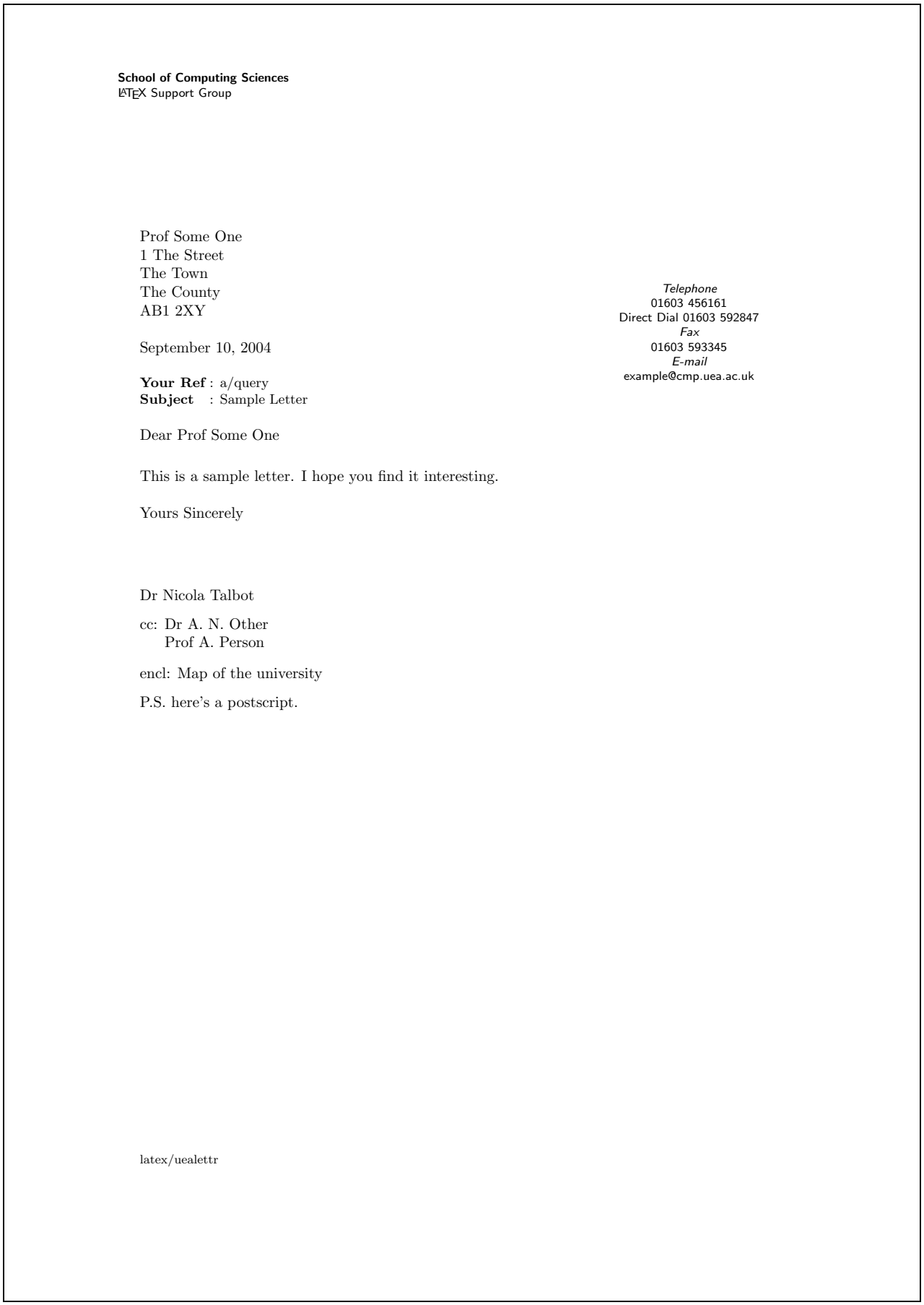
```
% Sender details

\signature{Dr Nicola Talbot}
\division{\LaTeX\ Support Group}
\location{School of Computing Sciences}
\telephone{01603 456161}
\directdial{01603 592847}
\fax{01603 593345}
\email{example@cmp.uea.ac.uk}
```

↓Code

and the main file containing the letter would then look like:

↑Code

```
\documentclass[personal,confidential]{uealettr}

\input{sender} % input sender details

% Letter details
\subject{Sample Letter}
```



School of Computing Sciences
LaTeX Support Group

Prof Some One
1 The Street
The Town
The County
AB1 2XY

Telephone
01603 456161
Direct Dial 01603 592847
Fax
01603 593345
E-mail
example@cmp.uea.ac.uk

September 10, 2004

Your Ref : a/query
Subject : Sample Letter

Dear Prof Some One

This is a sample letter. I hope you find it interesting.

Yours Sincerely

Dr Nicola Talbot

cc: Dr A. N. Other
Prof A. Person

encl: Map of the university

P.S. here's a postscript.

latex/uealettr

Figure 2.1: Sample letter using uealettr class file

```
\myref{latex/uealettr}
\yourref{a/query}

\begin{document}

% This is the letter
\begin{letter}{Prof Some One\\1 The Street\\The Town\\
The County\\AB1 2XY}

\opening{Dear Prof Some One}

This is a sample letter.  I hope you find it interesting.

\closing{Yours Sincerely}

\cc{Dr A. N. Other\\Prof A. Person}

\encl{Map of the university}

\ps P.S. here's a postscript.

\end{letter}

\end{document}
```

↓Code

The following options may be passed to uealettr:

headed	Letter will be printed on headed paper, so the university logo and address are omitted. (Default).
notheaded	Letter will be printed on plain paper. The university's address will be included in the document, and you will have to specify the logo using the command: `\logo{`*logo details*`}`. For example: `\logo{\includegraphics{uealogo}}`
personal	The letter is personal. The word **PERSONAL** will be typeset above the recipient's address.
notpersonal	The letter is not personal. (Default).
confidential	The letter is confidential. The word **CONFIDENTIAL** will be typeset above the recipient's address.
notconfidential	The letter is not confidential. (Default).
datetime	Use the datetime[2] package to display the date in full on the first page, and abbreviated in the header of subsequent pages.
nodatetime	Don't use datetime package. (Default).

We can now modify the above example so that the letter is personal and confidential (result shown in Figure 2.2):

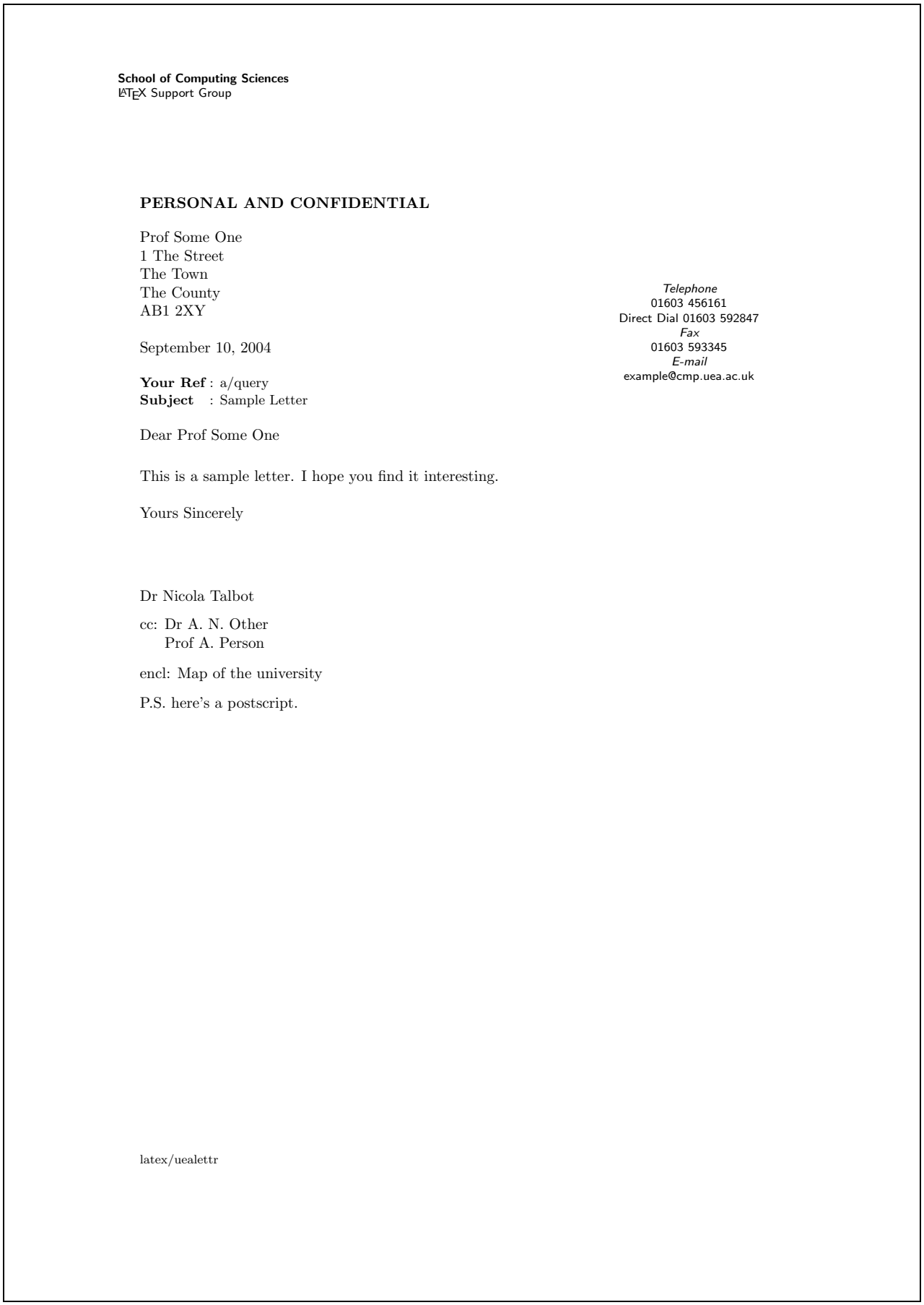
↑Code

```
\documentclass[personal,confidential]{uealettr}

\input{sender} % input sender details

% Letter details
```

[2] http://theoval.cmp.uea.ac.uk/~nlct/latex/packages/index.html#datetime

```
\subject{Sample Letter}
\myref{latex/uealettr}
\yourref{a/query}

\begin{document}

% This is the letter
\begin{letter}{Prof Some One\\1 The Street\\The Town\\
The County\\AB1 2XY}

\opening{Dear Prof Some One}

This is a sample letter.  I hope you find it interesting.

\closing{Yours Sincerely}

\cc{Dr A. N. Other\\Prof A. Person}

\encl{Map of the university}

\ps P.S. here's a postscript.

\end{letter}

\end{document}
```

↓Code



School of Computing Sciences
LaTeX Support Group

PERSONAL AND CONFIDENTIAL

Prof Some One
1 The Street
The Town
The County
AB1 2XY

Telephone
01603 456161
Direct Dial 01603 592847
Fax
01603 593345
E-mail
example@cmp.uea.ac.uk

September 10, 2004

Your Ref : a/query
Subject : Sample Letter

Dear Prof Some One

This is a sample letter. I hope you find it interesting.

Yours Sincerely

Dr Nicola Talbot

cc: Dr A. N. Other
Prof A. Person

encl: Map of the university

P.S. here's a postscript.

latex/uealettr

Figure 2.2: Sample letter using uealettr class file with personal and confidential class options

2.1 Mail Merging

In the previous section, the example used had only one `letter` environment within the document, so only one letter was produced, however it is possible to have multiple `letter` environments within one document. For example, suppose you want to invite Miss A. Smith, Mr B. Jones and Mr C. Brown to an interview, you could do this as follows:

↑Code

```
\documentclass{uealettr}

\input{sender} % input sender details

% Subject line will be the same for all three letters
\subject{Interview}

\begin{document}

% First letter
\myref{interview/a.smith/2004}
\begin{letter}{Miss A. Smith\\1 The Street\\The Town\\The County\\AB1 2XY}

\opening{Dear Miss Smith}

You are invited to an interview on 2 Oct 2004 at 2:00pm.
Please report to the General Office on arrival.

\closing{Yours Sincerely}

\encl{Campus Map}
\end{letter}

% Second letter
\myref{interview/b.jones/2004}
\begin{letter}{Mr B. Jones\\2 The Close\\The Town\\The County\\AB2 4XY}

\opening{Dear Mr Jones}

You are invited to an interview on 2 Oct 2004 at 2:30.
Please report to the General Office on arrival.

\closing{Yours Sincerely}

\encl{Campus Map}
\end{letter}

% Third letter
\myref{interview/c.brown/2004}
\begin{letter}{Mr C. Brown\\3 The Road\\The Town\\The County\\AB3 6XY}

\opening{Dear Mr Jones}

You are invited to an interview on 2 Oct 2004 at 2:30.
Please report to the General Office on arrival.

\closing{Yours Sincerely}

\encl{Campus Map}
\end{letter}

\end{document}
```

↓Code

This illustrates how you can have multiple letters within one document that use the same sender and subject details, however it is somewhat cumbersome, and since all the letters are along the same lines, this task can be made easier by mail merging.

There are several mail merging packages available. This document details the csvtools[3] package. This package defines the command:

`\applyCSVfile{`*filename*`}{`*text*`}`

which reads in information from a comma separated variable (CSV) file[4] whose name is specified by *filename*, and repeatedly applies the contents of each line in *filename* to *text*. This is best illustrated with an example. Suppose there is a file called `details.csv` that has the following contents:

```
Name,Address,Time,Date,Reference
Miss A. Smith,1 The Street\\The Town\\The County\\AB1 2XY,2:00pm,2 Oct 2004,interview/a.smith/2004
Mr B. Jones,2 The Close\\The Town\\The County\\AB2 4XY,2:30pm,2 Oct 2004,interview/b.jones/2004
Mr C. Brown,3 The Road\\The Town\\The County\\AB3 6XY,3:00pm,2 Oct 2004,interview/c.brown/2004
```

The `\applyCSVfile` will create the following commands (based on the first row of `details.csv`): `\insertName`, `\insertAddress`, `\insertTime`, `\insertDate`, `\insertReference`. These can be used within the *text* that makes up the second argument to `\applyCSVfile`. The document above can be made much simpler now by doing:

↑Code

```
\documentclass{uealettr}

\usepackage{csvtools}

\input{sender} % input sender details

% Subject line will be the same for all letters
\subject{Interview}

\begin{document}

\applyCSVfile{details.csv}{%
\myref{\insertReference}
\begin{letter}{\insertName\\\insertAddress}

\opening{Dear \insertName}

You are invited to an interview on \insertDate\ at \insertTime.
Please report to the General Office on arrival.

\closing{Yours Sincerely}

\encl{Campus Map}
\end{letter}}

\end{document}
```

↓Code

We can further refine this example by noting that the reference is made up of the applicant's name and the year. We can modify `details.csv` as follows:

```
Title,Initials,Surname,Address,Time,Date
Miss,A.,Smith,1 The Street\\The Town\\The County\\AB1 2XY,2:00pm,2 Oct 2004
Mr,B.,Jones,2 The Close\\The Town\\The County\\AB2 4XY,2:30pm,2 Oct 2004
Mr,C.,Brown,3 The Road\\The Town\\The County\\AB3 6XY,3:00pm,2 Oct 2004
```

[3] http://theoval.cmp.uea.ac.uk/~nlct/latex/packages/index.html#csvtools

[4] an Excel file can be converted to a CSV file by selecting `.csv` file type in the "Save As..." dialogue box.

Our source code can now be modified as follows:

↑Code

```
\documentclass{uealettr}

\usepackage{csvtools}

\input{sender} % input sender details

% Subject line will be the same for all letters
\subject{Interview}

\begin{document}

\applyCSVfile{details.csv}{%
\myref{interview/\MakeLowercase{\insertInitials.\insertSurname}/\the\year}
\begin{letter}{\insertTitle\ \insertInitials\ \insertSurname
\\\insertAddress}

\opening{Dear \insertTitle\ \insertSurname}

You are invited to an interview on \insertDate at \insertTime.
Please report to the General Office on arrival.

\closing{Yours Sincerely}

\encl{Campus Map}
\end{letter}}

\end{document}
```

↓Code

A few notes:

- In the last example, the commands `\insertName` and `\insertReference` no longer exist, as the header line in `details.csv` has changed.
- There are three new commands that weren't in the previous example: `\insertTitle`, `\insertInitials` and `\insertSurname`. These replace `\insertName`.
- The command `\MakeLowercase` is a standard LaTeX 2_ε command, and simply converts its argument to lowercase.
- The current year is obtained by accessing TeX's `\year` register: `\the\year`.
- The command `\insertDate` (the last entry in the CSV file) has a space appended, which is why there is no `\␣` after the command. The reason for this is that the end of line character in `details.csv` is converted into a space by TeX.

You can download letterex.tex, details.csv and sender.tex if you want to try out the above example. (You will also need to install uealettr[5] and csvtools[6]).

The result from the above example is shown in Figures 2.3, 2.4 and 2.5

[5] http://theoval.cmp.uea.ac.uk/~nlct/latex/packages/index.html#uealettr
[6] http://theoval.cmp.uea.ac.uk/~nlct/latex/packages/index.html#csvtools

School of Computing Sciences
LaTeX Support Group

Miss A. Smith
1 The Street
The Town
The County
AB1 2XY

Telephone
01603 456161
Direct Dial 01603 592847
Fax
01603 593345
E-mail
example@cmp.uea.ac.uk

September 10, 2004

Subject : Interview

Dear Miss Smith

You are invited to an interview on 2 Oct 2004 at 2:00pm. Please report to the General Office on arrival.

Yours Sincerely

Dr Nicola Talbot

encl: Campus Map

interview/a..smith/2004

Figure 2.3: Mail merging example using csvtools package (page 1)

School of Computing Sciences
LaTeX Support Group

Mr B. Jones
2 The Close
The Town
The County
AB2 4XY

Telephone
01603 456161
Direct Dial 01603 592847
Fax
01603 593345
E-mail
example@cmp.uea.ac.uk

September 10, 2004

Subject : Interview

Dear Mr Jones

You are invited to an interview on 2 Oct 2004 at 2:30pm. Please report to the General Office on arrival.

Yours Sincerely

Dr Nicola Talbot

encl: Campus Map

interview/b..jones/2004

Figure 2.4: Mail merging example using csvtools package (page 2)

School of Computing Sciences
LaTeX Support Group

Mr C. Brown
3 The Road
The Town
The County
AB3 6XY

Telephone
01603 456161
Direct Dial 01603 592847
Fax
01603 593345
E-mail
example@cmp.uea.ac.uk

September 10, 2004

Subject : Interview

Dear Mr Brown

You are invited to an interview on 2 Oct 2004 at 3:00pm. Please report to the General Office on arrival.

Yours Sincerely

Dr Nicola Talbot

encl: Campus Map

interview/c..brown/2004

Figure 2.5: Mail merging example using csvtools package (page 3)

Chapter 3

Writing Examination Papers Using ueaexam

UEA examination papers can be written using the ueaexam[1] class file. The documentation is detailed below, along with some examples. The exam paper can also be converted into a booklet using the psutils suit.

3.1 Documentation

The following commands may be used in the preamble:

`\university{`*name*`}` The university's name. By default this is: University of East Anglia.

`\school{`*name*`}` The school's name. By default this is: School of Computing Sciences.

`\semester{`*text*`}` The semester. By default this is the current semester. (The Autumn semester is considered to be from August to January (inc), and the Spring semester is considered to be the remainder of the year.)

`\examyear{`*year*`}` The academic year (e.g 2000/2001). By default this is the current academic year.

`\course{`*code*`}{`*name*`}` The course code and course name. For example:

```
\course{CMPS-1A4Y}{Programming --- Languages and Software
Construction}
```

`\timeallowed{`*time*`}` The time allowed to complete the exam. For example:

```
\timeallowed{2 hours}
```

`\rubric{`*text*`}` The rubric on the front page regarding the number of questions to be done in each section can be automatically generated using the optional argument to the `\section` command (see below), however this can be modified using the command `\rubric`. The action of the `\rubric` command depends on whether the optional argument to `\section` has been used, and whether or not this is the first or subsequent pass of LaTeX. If this is the first pass of LaTeX or if none of the `\section` commands have their optional argument, then the text specified by the command `\rubric{`*text*`}` will appear on the front page. On the other hand, if this is a subsequent pass, and the `\section` commands have their optional argument, then the text specified by the command `\rubric{`*text*`}` will be appended to the rubric automatically generated.

`\turnovertrue` If you want the words "TURN OVER" at the bottom of each page[2] (except the last page), put the command `\turnovertrue` in the preamble. (This is the default).

`\turnoverfalse` If you don't want the words "TURN OVER" at the bottom of each page, put the command `\turnoverfalse` in the preamble.

[1] http://theoval.cmp.uea.ac.uk/~nlct/latex/packages/index.html#ueaexam

[2] odd pages only, if two sided printing specified

`\marks{`*num*`}` This command will print [*num* marks] (or [*num* mark] if *num* is 1) in the margin[3]. If the text is too wide it will overlap the main text, so you may want to put it on a following blank line. The style can be modified by changing the definition of `\marklabel` By default it is defined to be:

```
[\themark\ \markname]
```

where `\themark` is the number *num* passed as the argument to `\marks` and `\markname` is either `mark` or `marks` depending on whether `\themark` is 1 or greater than 1, respectively. So to change the marks to be displayed, say, in round brackets instead of square brackets, you would need to do:

```
\renewcommand{\marklabel}{(\themark\ \markname)}
```

To change it so that the marks are percentages, you can do:

```
\renewcommand{\marklabel}{[\themark\%]}
```

The mark label is formatted according to the command `\markformat`. By default, `\markformat` is defined to be

```
\marginpar{\makebox[\marginparwidth][r]{\marklabel}}
```

but can be redefined. For example, instead of placing the marks in the margin, you might want them flushright instead, in which case you could redefine `\markformat` as follows:

```
\renewcommand{\markformat}{\hfill\marklabel}
```

You can rescale your marks by changing the value of `\markscale`. For example, if all your marks are out of 10, but you then decide to make them out of 100, you would need to multiply all current marks by 10:

```
\renewcommand{\markscale}{10}
```

You can also divide the marks by changing the value of `\markfrac`. Both `\markscale` and `\markfrac` must be integers.

`\section[`*text*`]{`*title*`}` The only sectioning command defined within this class file is `\section`. It takes one mandatory argument, and has no starred-version. This command issues a `\clearpage`, prints "SECTION" followed by the section letter (e.g. A), and on the following line it prints the argument. Both lines are centrally aligned. As usual, the section can be referenced using `\label` and `\ref`. For example, the input:

```
\section{Answer TWO questions from this Section.}
```

would produce the output:

SECTION A
Answer TWO questions from this Section.

The `\section` command may occur within an `enumerate` or any of the other list-making environments.

There is also an optional argument to the `\section` command that allows the rubric on the front page to be automatically generated. This is useful if different sections of an exam paper are written by different people. Extra sections can be inserted without worrying about updating the information on the front page. Note that as the `\section` commands come after the front page, the information is saved in the auxiliary file, and the document must be re-LaTeXed to update the information on the front page. For example, the input:

```
\section[TWO questions]{Answer TWO questions from
this Section.}

      ⋮

\section[and THREE questions]{Answer THREE questions
from this Section.}
```

[3]The right margin, irrespective of one- or two-sided printing

will produce the following text on the front page (after it has been LaTeXed twice):

Answer TWO questions from Section A and THREE questions from Section B.

If the following command also occurs in the preamble

```
\rubric{\\Use two answer books: one for Section~A
and one for Section~B.}
```

Then the following text will appear on the front page:

Answer TWO questions from Section A and THREE questions from Section B.
Use two answer books: one for Section A and one for Section B.

Note: It is best not to have any commands within the optional argument of `\section`, unless they expand to a simple text string[4]. At best, this will cause LaTeX to keep complaining that the title page is not up to date, at worse it will cause a "TeX capacity exceeded" error.

`\addtorubric{`*text*`}` To insert any additional text to the rubric, use `\addtorubric{`*text*`}`. The above note also applies to this command.

3.2 Example Documents

1. The following is a short sample document illustrating the use of this class file:

†Code

```
\documentclass{ueaexam}

\usepackage{times}
\usepackage{helvet}
\usepackage{courier}

\course{ABC-1XY}{SAMPLE COURSE}
\timeallowed{2 hours}

\begin{document}
\begin{enumerate}
\section[THE question]{Answer ALL parts in this section.}

\item This is the first question, it has two parts.

\begin{enumerate}
\item The first part  \marks{20}
\item The second part \marks{20}
\end{enumerate}

\section[and TWO questions]{Answer TWO questions in this section}

\item This is the first question of the second part,
but because we are still in the same enumerate environment,
this question is question number 2.  If the last line of this
paragraph is long, it will run into the marks so in this
case, we can put the marks on the following line to make it neater.
\par\mbox{}\marks{30}

\item This is question number 3.\marks{30}

\item This is the last question.\marks{30}
\end{enumerate}
\end{document}
```

[4] This shouldn't be much of a problem as it's unlikely that there will be any, although it does mean that you can't use any spacing macros (such as ~) either.

↓Code

The result from the above example is shown in Figures 3.1, 3.2 and 3.3.

You can download exam1.tex if you want to try out the above example. (You will also need to install ueaexam[5]).

2. In this example, the exam is made up of three sections, where each section is written by three different lecturers (call them Dr A, Dr B and Dr C.) Rather than the lecturers trying to determine who has the most up-to-date version of the file, each section can be placed in a separate file, say `A.tex`, `B.tex` and `C.tex`. In this way, each lecturer can independently edit their own section of the exam. The main file would then look as follows:

↑Code

```
\documentclass{ueaexam}

\usepackage{times}
\usepackage{helvet}
\usepackage{courier}

\course{ABC-2XY}{SAMPLE COURSE II}
\timeallowed{3 hours}
\rubric{\\Use a separate answer book for each section.}

\renewcommand{\marklabel}{[\themark\%]}

\begin{document}
\begin{enumerate}
\input{A}
\addtorubric{,}
\input{B}
\addtorubric{ and}
\input{C}
\end{enumerate}
\end{document}
```

↓Code

The files `A.tex`, `B.tex` and `C.tex` might look something like:
File A.tex :

↑Code

```
% A.tex
\section[ONE question]{Answer ONE question from this section.}

\item Solve the following equation:
\begin{displaymath}
x^2 +2x + 1 = 0
\end{displaymath}
\marks{40}

\item  Factorise the following function:
\begin{displaymath}
```

[5] http://theoval.cmp.uea.ac.uk/~nlct/latex/packages/index.html#ueaexam

UNIVERSITY OF EAST ANGLIA

School of Computing Sciences

Spring Semester Examinations 2003/2004

SAMPLE COURSE

ABC-1XY

Time allowed: 2 hours

Answer THE question from Section A and TWO questions from Section B.

DO NOT TURN OVER UNTIL YOU ARE TOLD TO DO SO BY THE INVIGILATOR

(ABC-1XY)

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Figure 3.1: Sample exam paper using ueaexam (page 1)

-2-

SECTION A

Answer ALL parts in this section.

1. This is the first question, it has two parts.

   (a) The first part [20 marks]

   (b) The second part [20 marks]

Figure 3.2: Sample exam paper using ueaexam (page 2)

-3-

SECTION B

Answer TWO questions in this section

2. This is the first question of the second part, but because we are still in the same enumerate environment, this question is question number 2. If the last line of this paragraph is long, it will run into the marks so in this case, we can put the marks on the following line to make it neater.

[30 marks]

3. This is question number 3. [30 marks]

4. This is the last question. [30 marks]

END OF PAPER

Figure 3.3: Sample exam paper using ueaexam (page 3)

```
f(x) = x^2 - 1
\end{displaymath}
\marks{40}

\item  Find the roots of $f$, where $f$ is given by
\begin{displaymath}
f(x) = x^3 + 2x^2 + x
\end{displaymath}
\marks{40}
```

↓Code

File B.tex :

↑Code

```
% B.tex
\section[THREE questions]{Answer THREE questions from this section.}

\item Differentiate the following function w.r.t.\ $x$:
\begin{displaymath}
f(x) = \sin 4x
\end{displaymath}
\marks{10}

\item Find $f'(x)$ where $f(x)$ is given by
\begin{displaymath}
f(x) = \exp(x^2)
\end{displaymath}
\marks{10}

\item Find the derivative of $y$ with respect to $x$ where
\begin{displaymath}
y = \frac{1}{\sin(x) + \cos(x)}
\end{displaymath}
\marks{10}

\item Find the first order derivative of the following function:
\begin{displaymath}
f(x) = g(x)^{h(x)}
\end{displaymath}
where $g(x)$ and $h(x)$ are continuous functions.
\marks{10}
```

↓Code

File C.tex :

↑Code

```
% C.tex
\section[ALL questions]{Answer ALL questions in this section.}

\item Compute the following definite integral:
\begin{displaymath}
\int_0^1 \sin(x) dx
\end{displaymath}
\marks{15}
```

```
\item Solve the following indefinite integral:
\begin{displaymath}
\int x\sin(x) dx
\end{displaymath}
\marks{15}
```

↓Code

The result from the above example is shown in Figures 3.4, 3.5, 3.6 and 3.7.

You can download exam2.tex, A.tex, B.tex and C.tex if you want to try out the above example. (You will also need to install ueaexam[6]).

3.3 Converting Exam Paper into Booklet

The exam paper can be converted into an A5 booklet using `dvips`, `psbook` and `psnup` as follows:

Suppose your source code is in the file `exam.tex`, then the following commands typed into the command prompt will convert the file into an A5 booklet:

```
latex exam.tex
latex exam.tex
dvips -o exam.ps exam.dvi
psbook exam.ps exam.bk.ps
psnup -2 exam.bk.ps exam.booklet.ps
```

The resulting file `exam.booklet.ps` should then be printed doubled-sided, stapled down the middle, and folded to produce an A5 booklet. The paper size can be changed by using different command line options, see the `psutils` documentation for more information.

[6] http://theoval.cmp.uea.ac.uk/~nlct/latex/packages/index.html#ueaexam

UNIVERSITY OF EAST ANGLIA

School of Computing Sciences

Spring Semester Examinations 2003/2004

SAMPLE COURSE II

ABC-2XY

Time allowed: 3 hours

Answer ONE question from Section A, THREE questions from Section B and ALL questions from Section C.

Use a separate answer book for each section.

DO NOT TURN OVER UNTIL YOU ARE TOLD TO DO SO BY THE INVIGILATOR

(ABC-2XY)

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Figure 3.4: Sample exam paper using ueaexam and three \input'd sections (page 1)

-2-

SECTION A

Answer ONE question from this section.

1. Solve the following equation:

$$x^2 + 2x + 1 = 0$$

[40%]

2. Factorise the following function:

$$f(x) = x^2 - 1$$

[40%]

3. Find the roots of f, where f is given by

$$f(x) = x^3 + 2x^2 + x$$

[40%]

(ABC-2XY)

Figure 3.5: Sample exam paper using ueaexam and three `\input`'d sections (page 2)

-3-

SECTION B

Answer THREE questions from this section.

4. Differentiate the following function w.r.t. x:

$$f(x) = \sin 4x$$

[10%]

5. Find $f'(x)$ where $f(x)$ is given by

$$f(x) = \exp(x^2)$$

[10%]

6. Find the derivative of y with respect to x where

$$y = \frac{1}{\sin(x) + \cos(x)}$$

[10%]

7. Find the first order derivative of the following function:

$$f(x) = g(x)^{h(x)}$$

where $g(x)$ and $h(x)$ are continuous functions. [10%]

Figure 3.6: Sample exam paper using ueaexam and three `\input`'d sections (page 3)

-4-

SECTION C

Answer ALL questions in this section.

8. Compute the following definite integral:

$$\int_0^1 \sin(x)dx$$

[15%]

9. Solve the following indefinite integral:

$$\int x \sin(x)dx$$

[15%]

END OF PAPER

(ABC-2XY)

Figure 3.7: Sample exam paper using ueaexam and three `\input`'d sections (page 4)

Chapter 4

Writing Course Tests Using ueatest

Course tests can be typeset using the ueatest[1] class file. The available commands are very similar to those in the ueaexam class file described in Chapter 3.

4.1 Documentation

The following commands are supplied with the ueatest class file:

`\university{`*name*`}` The university's name. By default this is: University of East Anglia.

`\school{`*name*`}` The school's name. By default this is: School of Computing Sciences.

`\semester{`*text*`}` The semester. By default this is the current semester. (The Autumn semester is considered to be from August to January (inc), and the Spring semester is considered to be the remainder of the year.)

`\theyear{`*text*`}` The current year (which will appear in the footer). By default this is the current year.

`\course{`*code*`}{`*name*`}` The course code and course name. For example:

```
\course{CMPS-1A4Y}{Programming --- Languages and
Software Construction}
```

`\lecturer{`*name(s)*`}` The course lecturer(s).

`\marks{`*num*`}` This command will print [*num* marks] (or [*num* mark] if *num* is 1) in the margin[2]. If the text is too wide it will overlap the main text, so you may want to put it on a following blank line. The style can be modified by changing the definition of `\marklabel` By default it is defined to be:

```
[\themark\ \markname]
```

where `\themark` is the number *num* passed as the argument to `\marks` and `\markname` is either `mark` or `marks` depending on whether `\themark` is 1 or greater than 1, respectively. So to change the marks to be displayed, say, in round brackets instead of square brackets, you would need to do:

```
\renewcommand{\marklabel}{(\themark\ \markname)}
```

To change it so that the marks are percentages, you can do:

```
\renewcommand{\marklabel}{[\themark\%]}
```

`\markformat` The mark label is formatted according to the command `\markformat`. By default, `\markformat` is defined to be

```
\marginpar{\makebox[\marginparwidth][r]{\marklabel}}
```

but can be redefined. For example, instead of placing the marks in the margin, you might want them flushright instead, in which case you could redefine `\markformat` as

[1] http://theoval.cmp.uea.ac.uk/~nlct/latex/packages/index.html#ueatest

[2] The right margin, irrespective of one- or two-sided printing

follows:

```
\renewcommand{\markformat}{\hfill\marklabel}
```

`\markscale` You can rescale your marks by changing the value of `\markscale`. For example, if all your marks are out of 10, but you then decide to make them out of 100, you would need to multiply all current marks by 10:

```
\renewcommand{\markscale}{10}
```

`\markfrac` You can also divide the marks by changing the value of `\markfrac`. Both `\markscale` and `\markfrac` must be integers.

`\date{`*text*`}` The date of the test. This is the current date (as specified by `\today`) by default.

4.2 Examples

1. This example changes the marks so that they are displayed in sans-serif and aligns them flushright instead of in the margin.

↑Code

```
\documentclass{ueatest}

\course{CMPS-MC22}{Mathematics and Algorithms for Bioinformatics}
\lecturer{SJH/GCC}

\renewcommand{\markformat}{\hfill\textsf{\marklabel}}

\begin{document}

\begin{enumerate}
\item First question.\marks{10}

\item Second question.
   \begin{enumerate}
      \item First part.\marks{5}
      \item Second part.\marks{5}
   \end{enumerate}
\end{enumerate}

\end{document}
```

↓Code

This produces the output shown in Figure 4.1.

2. In this example, the marks were originally out of 20, but it was then decided to change them to percentages. This is easily done by setting `\markscale` to 5, and redefining `\marklabel`

UNIVERSITY OF EAST ANGLIA

School of Computing Sciences

CMPS-MC22 — Mathematics and Algorithms for Bioinformatics

COURSE TEST

1. First question. [10 marks]
2. Second question.
   (a) First part. [5 marks]
   (b) Second part. [5 marks]

SJH/GCC
September 11, 2004

Figure 4.1: Sample course test using ueatest

↑Code

```
\documentclass{ueatest}

\course{CMPS-MC22}{Mathematics and Algorithms for Bioinformatics}
\lecturer{SJH/GCC}

\renewcommand{\marklabel}{[\themark\%]}
\renewcommand{\markscale}{5}

\begin{document}

\begin{enumerate}
\item First question.\marks{20}

\item Second question.
   \begin{enumerate}
      \item First part.\marks{10}
      \item Second part.\marks{5}
      \item Third part.\marks{5}
   \end{enumerate}
\end{enumerate}

\end{document}
```

↓Code

This produces the output shown in Figure 4.2.

3. In this example, the marks were originally out of 75. To turn the marks into a percentage, they need to be multiplied by 4 and divided by 3. (This isn't guaranteed to work as integer division can cause rounding errors.)

↑Code

```
\documentclass{ueatest}

\course{CMPS-MC22}{Mathematics and Algorithms for Bioinformatics}
\lecturer{SJH/GCC}

\renewcommand{\marklabel}{[\themark\%]}
\renewcommand{\markscale}{4}
\renewcommand{\markfrac}{3}

\begin{document}

\begin{enumerate}
\item First question.\marks{75}

\item Second question.
   \begin{enumerate}
      \item First part.\marks{51}
      \item Second part.\marks{18}
      \item Third part.\marks{6}
   \end{enumerate}
\end{enumerate}

\end{document}
```

UNIVERSITY OF EAST ANGLIA

School of Computing Sciences

CMPS-MC22 — Mathematics and Algorithms for Bioinformatics

COURSE TEST

1. First question. [100%]
2. Second question.
   (a) First part. [50%]
   (b) Second part. [25%]
   (c) Third part. [25%]

SJH/GCC
September 11, 2004

Figure 4.2: Sample course test using `ueatest`. `\markscale` and `\marklabel` changed to make the marks out of 100 instead of 20.

↓Code

This produces the output shown in Figure 4.3.

UNIVERSITY OF EAST ANGLIA

School of Computing Sciences

CMPS-MC22 — Mathematics and Algorithms for Bioinformatics

COURSE TEST

1. First question. [100%]
2. Second question.
   (a) First part. [68%]
   (b) Second part. [24%]
   (c) Third part. [8%]

SJH/GCC
September 11, 2004

Figure 4.3: Sample course test using ueatest. `\markscale`, `\markfrac` and `\marklabel` changed to make the marks out of 100 instead of 75.

Chapter 5

Writing Assignments Using **ueaassig** and **marksheet**

Assignments can be written using the class file ueaassig[1]. Corresponding mark sheets can be written using the class file marksheet[2].

5.1 Using **ueaassig**

The ueaassig class file can be used to generate course work assignments.

An empty `document` environment will produce the basic sheet with default values filled in. So the following code:

```
\documentclass{ueaassig}
\begin{document}
\end{document}
```

will produce the output shown in Figure 5.1.

5.1.1 Preamble Commands

The following commands may be used in the preamble:

`\university{`*name*`}` The university's name. By default this is: UNIVERSITY OF EAST ANGLIA.

`\school{`*name*`}` The school's name. By default this is: School of Computing Sciences.

`\courselabel{`*text*`}` The course code. For example:

```
\courselabel{CMPS-1A4Y}
```

`\handinplace{`*text*`}` The place where the assignment must be handed in. By default this is: outside the CMP General Office.

`\lecturer{`*name*`}` The lecturer who set this assignment. For example:

```
\lecturer{Dr Cawley}
```

`\date{`*text*`}` The date the assignment was set. For example:

```
\date{Monday of week 2}
```

`\submission{`*text*`}` The deadline for the date and time of submission. For example:

```
\submission{Friday of week 3 before 16:30}
```

`\returndate{`*text*`}` The return date of the assignment. For example:

[1] http://theoval.cmp.uea.ac.uk/~nlct/latex/packages/index.html#ueaassig
[2] http://theoval.cmp.uea.ac.uk/~nlct/latex/packages/index.html#marksheet

COURSEWORK ASSIGNMENT **UNIVERSITY OF EAST ANGLIA**
School of Computing Sciences

Unit :
Assignment Title :

Date Set	:	
Date & Time of Submission	:	
Return Date	:	
Assignment Value	: %	
Set By	:	**Signed:**
Checked By	:	**Signed:**

Aim:

Learning outcomes:

Assessment criteria:

Description of assignment:

Required:

Handing in procedure:

Please post your completed work in the appropriate box outside the CMP General Office. Late work must be posted in the 'late' box. Your work will be date stamped whether you hand it in on time or not. We will accept work from you after the specified time of submission, but in this case you will be penalised, as your 'recorded' mark will be 0.8 times the awarded mark. Work handed in after this cut off date may be commented on, but awarded 0% unless there is good reason. If you have medical or other problems you can seek extensions to coursework deadlines. However, it is essential you obtain proper documentation in such cases (i.e. a medical certificate), to be handed in to the School General Office at the time of the difficulty.

Plagiarism:

Plagiarism is the copying or close paraphrasing of published or unpublished work, including the work of another student without the use of quotation marks and due acknowledgement. Plagiarism is regarded as a serious offence by the University and all cases will be reported to the Board of Examiners. Work that contains even small fragment of plagiarised material will be penalised.

Figure 5.1: Empty assignment sheet using ueaassig

```
\returndate{Friday of week 4}
```

`\assignvalue{`*num*`}` The percentage value of this assignment. For example:

```
\assignvalue{5}
```

`\checkedby{`*name*`}` The name of the person checking the assignment. For example:

```
\checkedby{Dr Someone}
```

`\latefrac{`*text*`}` The percentage by which the mark is reduced if the assignment is handed in late. By default this is 0.8.

For example, the following source code

```
\documentclass{ueaassig}

\lecturer{Dr G. C. Cawley}
\courselabel{CMPS-1A4Y}
\title{Laboratory Exercise 1 --- Getting Started}
\date{Monday of week 2}
\checkedby{Dr Someone}
\assignvalue{5}
\submission{Friday of week 3 before 16:30}
\returndate{Friday of week 4}

\begin{document}

\end{document}
```

will produce the output shown in Figure 5.2.

5.1.2 Document Commands

The following commands may be used within the `document` environment to fill in the appropriate sections:

`\aim{`*text*`}` The aim of the assignment. For example:

```
\aim{The aim of this laboratory exercise is to \ldots}
```

`\learning{`*text*`}` The learning outcomes. For example:

```
\learning{On successful completion of this exercise,
the student will have \ldots}
```

`\criteria{`*text*`}` The marking criteria. For example:

```
\criteria{The marking scheme used for this assignment is as
given on the accompanying marksheet}
```

`\assignment` ... `\endassignment` The description of the assignment should be enclosed by an `\assignment` ... `\endassignment` pair. For example:

```
\assignment
This is a description of the assignment.
\endassignment
```

`\requirement` ... `\endrequirement` The requirements should be enclosed by a `\requirement` ... `\endrequirement` pair. For example:

```
\requirement
These are the basic requirements.
\endrequirement
```

COURSEWORK ASSIGNMENT **UNIVERSITY OF EAST ANGLIA**
School of Computing Sciences

Unit : CMPS-1A4Y
Assignment Title : Laboratory Exercise 1 — Getting Started

Date Set	: Monday of week 2	
Date & Time of Submission	: Friday of week 3 before 16:30	
Return Date	: Friday of week 4	
Assignment Value	: 5%	
Set By	: Dr G. C. Cawley	**Signed:**
Checked By	: Dr Someone	**Signed:**

Aim:

Learning outcomes:

Assessment criteria:

Description of assignment:

Required:

Handing in procedure:

Please post your completed work in the appropriate box outside the CMP General Office. Late work must be posted in the 'late' box. Your work will be date stamped whether you hand it in on time or not. We will accept work from you after the specified time of submission, but in this case you will be penalised, as your 'recorded' mark will be 0.8 times the awarded mark. Work handed in after this cut off date may be commented on, but awarded 0% unless there is good reason. If you have medical or other problems you can seek extensions to coursework deadlines. However, it is essential you obtain proper documentation in such cases (i.e. a medical certificate), to be handed in to the School General Office at the time of the difficulty.

Plagiarism:

Plagiarism is the copying or close paraphrasing of published or unpublished work, including the work of another student without the use of quotation marks and due acknowledgement. Plagiarism is regarded as a serious offence by the University and all cases will be reported to the Board of Examiners. Work that contains even small fragment of plagiarised material will be penalised.

Figure 5.2: Assignment sheet using ueaassig with relevant title information

As an example, the following source code:

```
\documentclass{ueaassig}

 \lecturer{Dr G. C. Cawley}
 \courselabel{CMPS-1A4Y}
 \title{Laboratory Exercise 1 --- Getting Started}
 \date{Monday of week 2}
 \checkedby{Dr Someone}
 \assignvalue{5}
 \submission{Friday of week 3 before 16:30}
 \returndate{Friday of week 4}

\begin{document}

% Assignment aim

\aim{The aim of this laboratory exercise is to \ldots}

% What the student will have learnt by completing the exercise

\learning{On successful completion of this exercise, the student
will have \ldots}

% The marking criteria

\criteria{The marking scheme used for this assignment is as given
on the accompanying marksheet.}

% This is the main body of the assignment.

\assignment

This is the details of the assignment.

\endassignment

% The requirements for the assignment.

\requirement

These are the basic requirements.

\endrequirement
\end{document}
```

will produce the output shown in Figure 5.3.

5.2 Using marksheet

The marksheet[3] class file can be used to generate the mark sheet to be submitted with the student's work.

5.2.1 Preamble Commands

The following commands may be used in the preamble:

`\university{`*name*`}` The university's name. By default this is: University of East Anglia.

[3] http://theoval.cmp.uea.ac.uk/~nlct/latex/packages/index.html#marksheet

COURSEWORK ASSIGNMENT **UNIVERSITY OF EAST ANGLIA**
School of Computing Sciences

Unit : CMPS-1A4Y
Assignment Title : Laboratory Exercise 1 — Getting Started

Date Set	: Monday of week 2	
Date & Time of Submission	: Friday of week 3 before 16:30	
Return Date	: Friday of week 4	
Assignment Value	: 5%	
Set By	: Dr G. C. Cawley	**Signed:**
Checked By	: Dr Someone	**Signed:**

Aim:

The aim of this laboratory exercise is to ...

Learning outcomes:

On successful completion of this exercise, the student will have ...

Assessment criteria:

The marking scheme used for this assignment is as given on the accompanying marksheet.

Description of assignment:

This is the details of the assignment.

Required:

These are the basic requirements.

Handing in procedure:

Please post your completed work in the appropriate box outside the CMP General Office. Late work must be posted in the 'late' box. Your work will be date stamped whether you hand it in on time or not. We will accept work from you after the specified time of submission, but in this case you will be penalised, as your 'recorded' mark will be 0.8 times the awarded mark. Work handed in after this cut off date may be commented on, but awarded 0% unless there is good reason. If you have medical or other problems you can seek extensions to coursework deadlines. However, it is essential you obtain proper documentation in such cases (i.e. a medical certificate), to be handed in to the School General Office at the time of the difficulty.

Plagiarism:

Plagiarism is the copying or close paraphrasing of published or unpublished work, including the work of another student without the use of quotation marks and due acknowledgement. Plagiarism is regarded as a serious offence by the University and all cases will be reported to the Board of Examiners. Work that contains even small fragment of plagiarised material will be penalised.

Figure 5.3: Sample assignment sheet using ueaassig with assignment details

`\school{`*name*`}` The school's name. By default this is: School of Computing Sciences.

`\courselabel{`*text*`}` The course code. For example:

```
\courselabel{CMPS-1A4Y}
```

`\title{`*text*`}` The assignment title. For example:

```
\title{Assignment 1 --- Getting Started}
```

`\labgroup` If the command `\labgroup` appears in the preamble, an extra field for the student's labgroup will appear.

5.2.2 The Document

An empty document environment:

```
\documentclass{marksheet}
\begin{document}
\end{document}
```

will produce the output shown in Figure 5.4:

Adding a course label and title using `\courselabel` and `\title` will add in the necessary unit and title information. E.g. the following source code

```
\documentclass{marksheet}

\courselabel{CMPS-1A4Y}
\title{Assignment 1 --- Getting Started}
\labgroup

\begin{document}
\end{document}
```

will produce the output shown in Figure 5.5:

Anything placed within the document environment will be placed in the blank space in the middle. E.g.

```
\documentclass{marksheet}

\courselabel{CMPS-1A4Y}
\title{Assignment 1 --- Getting Started}
\labgroup

\begin{document}

\textbf{Assessor's Comments:}

\end{document}
```

will produce the output shown in Figure 5.6:

This class file also defines the environment `marks` which is a tabulated environment that can be used in conjunction with the command:

`\category[`*num*`]{`*text*`}`

to specify the mark criteria.

Example:

```
\documentclass{marksheet}

\courselabel{CMPS-1A4Y}
\title{Assignment 1 --- Getting Started}
\labgroup
```

COURSEWORK COVERSHEET **UNIVERSITY OF EAST ANGLIA**
School of Computing Sciences

UNIT: *No course label specified*
ASSIGNMENT TITLE: *No assignment title specified*

To be completed by the student:

Full Name (Family name in CAPITALS): **Advisor:** .....

.....

Registration No: ..... **Date stamped:** .....

I certify that this work is my own, undertaken wholly for this assignment, and has not been copied in whole or part from other sources, except where specifically acknowledged

Signed ..... **Date** .....

To be completed by the marker.
Assessment criteria are specified below.

Provisional Mark Awarded:.....**%** **Date:** .....

Marked by: ..... **Checked by:** .....

Please be reminded that students should retain all returned coursework and have it available for External Examiners, if required. All marks are provisional until confirmed by the Board of Examiners.

PLEASE STAPLE THIS SHEET SECURELY TO YOUR COURSEWORK

Figure 5.4: Empty coursework coversheet using marksheet

COURSEWORK COVERSHEET **UNIVERSITY OF EAST ANGLIA**
School of Computing Sciences

UNIT: CMPS-1A4Y
ASSIGNMENT TITLE: Assignment 1 - Getting Started

To be completed by the student:

Full Name (Family name in CAPITALS): **Advisor:** .....

..... **Labgroup:** .....

Registration No: ..... **Date stamped:** .....

I certify that this work is my own, undertaken wholly for this assignment, and has not been copied in whole or part from other sources, except where specifically acknowledged

Signed ..... **Date** .....

To be completed by the marker.
Assessment criteria are specified below.

Provisional Mark Awarded:.....**%** **Date:** .....

Marked by: ..... **Checked by:** .....

Please be reminded that students should retain all returned coursework and have it available for External Examiners, if required. All marks are provisional until confirmed by the Board of Examiners.

PLEASE STAPLE THIS SHEET SECURELY TO YOUR COURSEWORK

Figure 5.5: Coursework coversheet using marksheet with title information

COURSEWORK COVERSHEET **UNIVERSITY OF EAST ANGLIA**
School of Computing Sciences

UNIT: CMPS-1A4Y
ASSIGNMENT TITLE: Assignment 1 - Getting Started

To be completed by the student:

Full Name (Family name in CAPITALS): **Advisor:** .....

..... **Labgroup:** .....

Registration No: ..... **Date stamped:** .....

I certify that this work is my own, undertaken wholly for this assignment, and has not been copied in whole or part from other sources, except where specifically acknowledged

Signed ..... **Date** .....

To be completed by the marker.
Assessment criteria are specified below.

Assessor's Comments:

Provisional Mark Awarded:.....**%** **Date:** .....

Marked by: ..... **Checked by:** .....

Please be reminded that students should retain all returned coursework and have it available for External Examiners, if required. All marks are provisional until confirmed by the Board of Examiners.

PLEASE STAPLE THIS SHEET SECURELY TO YOUR COURSEWORK

Figure 5.6: Coursework coversheet using marksheet with added text

```
\begin{document}

\begin{marks}
   \category[10]{Programming style (indentation, source code formatting
                 commenting and naming etc)}

   \category[6]{Correct operation (award grade in proportion to the amount
                of working code)}

   \category[4]{Bonus marks (award marks for evidence of extra effort or
                understanding demonstrated)}
\end{marks}

\textbf{Assessor's Comments}

\end{document}
```

will produce the output in Figure 5.7:

COURSEWORK COVERSHEET **UNIVERSITY OF EAST ANGLIA**
School of Computing Sciences

UNIT: CMPS-1A4Y
ASSIGNMENT TITLE: Assignment 1 - Getting Started

To be completed by the student:

Full Name (Family name in CAPITALS): **Advisor:** .....

..... **Labgroup:** .....

Registration No: ..... **Date stamped:** .....

I certify that this work is my own, undertaken wholly for this assignment, and has not been copied in whole or part from other sources, except where specifically acknowledged

Signed ..... **Date** .....

To be completed by the marker.
Assessment criteria are specified below.

	excellent	good	satisfactory	mediocre	poor	
Marks	5	4	3	2	1	Weight
Programming style (indentation, source code formatting, commenting and naming etc.)	☐	☐	☐	☐	☐	×10
Correct operation (award grade in proportion to the amount of working code)	☐	☐	☐	☐	☐	×6
Bonus marks (award marks for evidence of extra effort or understanding demonstrated)	☐	☐	☐	☐	☐	×4

Assessor's Comments:

Provisional Mark Awarded:.....% **Date:** .....

Marked by: ..... **Checked by:** .....

Please be reminded that students should retain all returned coursework and have it available for External Examiners, if required. All marks are provisional until confirmed by the Board of Examiners.

PLEASE STAPLE THIS SHEET SECURELY TO YOUR COURSEWORK

Figure 5.7: Coursework coversheet using marksheet with `marks` environment

Chapter 6

Generating Problem Sheets Using probsoln

It is possible to automatically generate a problem sheet by randomly selecting problems from a database using the probsoln[1] package. Once you have compiled the database, it makes it easier to generate a new problem sheet each year that is different from the previous year's problem sheet, thus alleviating the temptation for students to seek out the answers from the previous year's students.

The probsoln package can be used with either the ueaexam or ueatest class files. It is also possible to store the solutions to the problems in the same database and generate the answer sheet by passing the option answers to the probsoln package.

6.1 Documentation

The following commands are provided by the probsoln package:

`\newproblem`[*nargs*]{*label*}{*problem*}{*solution*}
: This command does not print anything, but merely stores the problem. The argument *label* is a unique string that is assigned to this problem so that it can be used later. The argument *problem* is normal LaTeX code that should be used to typeset the problem. The argument *solution* is normal LaTeX code that should be used to typeset the solution, if required. The optional argument *nargs* specifies the number of parameters this problem will take. By default this value is 0, but any value from 1 to 9 may be used. Each parameter is referred to by `#1`, `#2`, ..., `#9`.

  To generate a database, simply create a `.tex` file where all the problems are defined using `\newproblem`, and either `\input` it at the start of your document if you want to use specific problems (see Section 6.1), or pass it to `\selectrandomly` (see Section 6.1).

`\useproblem`{*label*}
: Once a problem has be defined using `\newproblem`, it can be typeset using the command `\useproblem`{*label*}. If the problem was defined to take arguments, the arguments to the problem should come after the label.

`\selectrandomly`{*filename*}{*n*}
: This command will select *n* problems that are defined in the file *filename*. Each problem is preceded by a `\item`, so the command `\selectrandomly` should occur within one of the list-like environments, such as `enumerate`.

  If a randomly selected problem requires arguments, a message similar to the following will be displayed:

```
Problem diff:quad requires 3 argument(s),
please specify (e.g. {5}{3}):
```

  Enter the required arguments, where each argument is enclosed in braces ({ }).

`\PSNrandseed`{*n*}
: This command specifies the seed for the random number generator. For example, `\PSNrandseed{\year}` will produce a different set of random problems each year, whereas `\PSNrandseed{\time}` will produce a different set of problems each time you LaTeX the problem (as long as you leave at least a minute between runs.)

[1] http://theoval.cmp.uea.ac.uk/~nlct/latex/packages/index.html#probsoln

`\showanswers` Show the solutions from that point on. May be localised by placing within a group.

`\hideanswers` Hide the solutions from that point on. May be localised by placing within a group.

showanswers The boolean variable showanswers is defined to be true if the answers are shown and false otherwise. You can therefore do something like:

```
\ifthenelse{\boolean{showanswers}}{\textbf{Solution Sheet}}{}
```

and **Solution Sheet** will be printed only if the answers are displayed. (For more information on `\ifthenelse` and `\boolean` see the documentation for the ifthen package by David Carlisle.)

The probsoln package has the following package options:

answers Show the solutions.

noanswers Hide the solutions (default).

6.2 Example Documents

The following is a short sample document illustrating the use of this package[2]:
Main file:

↑Code

```
\documentclass[a4paper]{article}

\usepackage{probsoln}

% use the current year as a random seed so that
% it produces a different set of problems each
% year.
%\PSNrandseed{\year}
% or specify a fixed random seed.
\PSNrandseed{2004}

% Uncomment the following line to generate solution sheet.
%\showanswers

\begin{document}
\ifthenelse{\boolean{showanswers}}{\textbf{Solution Sheet}}{}

\begin{enumerate}
\item Differentiate the following functions with respect to $x$:

\begin{enumerate}
\selectrandomly{easy.tex}{6}
\end{enumerate}

\selectrandomly{implicit.tex}{1}
\selectrandomly{1stprncp.tex}{1}

% The problems defined in arg.tex all take
% arguments.
\input{args.tex}

\item Differentiate the following polynomials
\begin{enumerate}
\item \useproblem{diff:quad}{3}{0}{-2}
```

[2]Note that you can just as easily use ueaexam[3] or ueatest[4] instead of the `article` class file

```
\item \useproblem{diff:quad}{1}{2}{3}
\item \useproblem{diff:quad}{5}{3}{0}
\end{enumerate}

\end{enumerate}

\end{document}
```

↓Code

File `easy.tex`:

↑Code

```
% These are all easy differentiation problems

\newproblem{diffeasy:gpowh}{%
\(f(x) = g(x)^{h(x)}.\)}{%
\begin{eqnarray*}
f(x) & = & e^{\ln g(x)^{h(x)}}\\
 & = & e^{h(x)\ln g(x)}\\
f'(x) & = & e^{h(x)\ln g(x)}(h'(x)\ln g(x) + h(x)\frac{g'(x)}{g(x)})\\
 & = & g(x)^{h(x)}(h'(x)\ln g(x) + \frac{h(x)g'(x)}{g(x)})
\end{eqnarray*}}

\newproblem{diffeasy:arcsin}{%
\(y = \arcsin(x)\)}{%
\[\sin(y) = x\]
diff. w.r.t. $x$:
\begin{eqnarray*}
\cos y \frac{dy}{dx} & = & 1\\
\frac{dy}{dx} & = & \frac{1}{\cos y}\\
 & = & \frac{1}{\sqrt{1 - \sin^2y}}\\
 & = & \frac{1}{\sqrt{1-x^2}}.
\end{eqnarray*}}

\newproblem{diffeasy:arccos}{%
$y = \arccos x$.}{%
\(\cos y = x\)
diff. w.r.t. $x$:
\begin{eqnarray*}
-\sin y \frac{dy}{dx} & = & 1\\
\frac{dy}{dx} & = & \frac{-1}{\sin y}\\
 & = & \frac{-1}{\sqrt{1-\cos^2y}}\\
 & = & \frac{-1}{\sqrt{1-x^2}}
\end{eqnarray*}}

\newproblem{diffeasy:tan}{%
\(y = \tan x\)}{%
\begin{eqnarray*}
y & = & \tan x\\
 & = & \frac{\sin x}{\cos x}\\
\frac{dy}{dx} & = & \frac{\cos x}{\cos x} + \sin x\times\frac{-1}{\cos^2x}\times
 -\sin x\\
 & = & 1 + \tan^2x\\
 & = & \sec^2x.
\end{eqnarray*}}

\newproblem{diffeasy:arctan}{%
\(y = \arctan x = \tan^{-1}x\)}{%
\[\tan y = x\]
diff w.r.t. $x$:
\begin{eqnarray*}
```

```
\sec^2y\frac{dy}{dx} & = & 1\\
\frac{dy}{dx} & = & \frac{1}{\sec^2y}\\
 & = & \frac{1}{1+\tan^2y}\\
 & = & \frac{1}{1+x^2}
\end{eqnarray*}}

\newproblem{diffeasy:cot}{%
\(y = (\tan x)^{-1} = \cot x\)}{%
\begin{eqnarray*}
\frac{dy}{dx} & = & -(\tan x)^{-2}\sec^2x\\
 & = & -\frac{\cos^2x}{\sin^2x}\cdot\frac{1}{\cos^2x}\\
 & = & \frac{-1}{\sin^2x}\\
 & = & -\csc^2x.
\end{eqnarray*}}

\newproblem{diffeasy:cosxsqsinx}{%
$y = \cos(x^2)\sin x$.}{%
\[\frac{dy}{dx} = -\sin(x^2)2x\sin x + \cos(x^2)\cos x\]}

\newproblem{diffeasy:xlnx}{%
$y = (x+1)\ln(x+1)$.}{%
\begin{eqnarray*}
\frac{dy}{dx} & = & \ln(x+1) + \frac{x+1}{x+1}\\
 & = & 1 + \ln(x+1).
\end{eqnarray*}}

\newproblem{diffeasy:glng}{%
$f(x) = g(x)\ln(g(x))$.}{%
\begin{eqnarray*}
f'(x) & = & g'(x)\ln(g(x)) + \frac{g(x)}{g(x)}g'(x)\\
 & = & g'(x)(1+\ln(g(x))).
\end{eqnarray*}}

\newproblem{diffeasy:sinx/x}{%
$y = \frac{\sin x}{x}$.}{%
\[\frac{dy}{dx} = \frac{\cos x}{x} - \frac{\sin x}{x^2}\]}
```

↓Code

File `implicit.tex`:

↑Code

```
% These are all implicit differentiation problems

\newproblem{imd:circ}{%
Find the gradient of the unit circle ($x^2 + y^2 = 1$).}{%
Differentiating with respect to $x$ gives:
\begin{eqnarray*}
2x + 2y\frac{dy}{dx} & = & 0\\
\frac{dy}{dx} & = & \frac{-2x}{2y}\\
 & = & \frac{-x}{\sqrt{1-x^2}}.
\end{eqnarray*}}

\newproblem{imd:ysq:xcuov2mx}{%
Find $\frac{dy}{dx}$, given
\begin{displaymath}
y^2 = \frac{x^3}{2-x}
\end{displaymath}}{%
Differentiating both sides w.r.t.\ $x$:
\begin{eqnarray*}
2y\frac{dy}{dx} & = & \frac{(2-x)3x^2 - x^3(-1)}{(2-x)^2}\\
 & = & \frac{3x^2(2-x) + x^3}{(2-x)^2}\\
```

```
 & = & \frac{6x^2 - 3x^3 + x^3}{(2-x)^2}\\
 & = & \frac{6x^2-2x^3}{(2-x)^2}\\
 & = & 2x^2\frac{3-x}{(2-x)^2}
\end{eqnarray*}
Therefore
\begin{displaymath}
y\frac{dy}{dx} = x^2\frac{3-x}{(2-x)^2}
\end{displaymath}}

\newproblem{imd:exy:IIxay}{%
Differentiate w.r.t.\ $x$:
\begin{displaymath}
e^{xy} = 2x + y
\end{displaymath}}{%
Differentiating both sides w.r.t.\ $x$:
\begin{eqnarray*}
e^{xy}(1y + x\frac{dy}{dx}) & = & 2 + \frac{dy}{dx}\\
xe^{xy}\frac{dy}{dx} - \frac{dy}{dx} & = & 2 - ye^{xy} \\
\frac{dy}{dx}(xe^{xy}-1) & = & 2 - ye^{xy}\\
\frac{dy}{dx} & = & \frac{2-ye^{xy}}{xe^{xy}-1}
\end{eqnarray*}}
```

↓Code

File 1stprncp.tex:

↑Code

```
% These all involve differentiating from 1st principles

\newproblem{dfp:xcube}{%
Differentiate $f(x) = x^3$ with respect to $x$ by first principles.}{%
\begin{eqnarray*}
\frac{dy}{dx} & = &
\lim_{\Delta x\rightarrow 0}\frac{f(x+\Delta x) - f(x)}{\Delta x}\\
 & = & \lim_{\Delta x\rightarrow 0}\frac{(x+\Delta x)^3-x^3}{\Delta x}\\
 & = &
\lim_{\Delta x\rightarrow 0}
\frac{(x+\Delta x)(x^2+2x\Delta x+(\Delta x)^2)-x^3}{\Delta x}\\
 & = &
\lim_{\Delta x\rightarrow 0}
\frac{x^3+3x^2\Delta x+3x(\Delta x)^2+(\Delta x)^3-x^3}{\Delta x}\\
 & = &
\lim_{\Delta x\rightarrow 0}
\frac{3x^2\Delta x+3x(\Delta x)^2+(\Delta x)^3}{\Delta x}\\
 & = & \lim_{\Delta x\rightarrow 0}3x^2+3x\Delta x + (\Delta x)^2\\
 & = & 3x^2
\end{eqnarray*}}

\newproblem{dfp:Ioverxsq}{%
Differentiate $\displaystyle f(x) = \frac{1}{x^2}$ with respect to $x$ by first
principles.}{%
\begin{eqnarray*}
\frac{df}{dx} & = &
\lim_{\Delta x\rightarrow 0}
\frac{\frac{1}{(x+\Delta x)^2}-\frac{1}{x^2}}{\Delta x}\\
 & = &
\lim_{\Delta x\rightarrow 0}
\frac{\frac{x^2-(x+\Delta x)^2}{x^2(x+\Delta x)^2}}{\Delta x}\\
 & = &
\lim_{\Delta x\rightarrow 0}
\frac{x^2-(x^2+2x\Delta x+(\Delta x)^2)}{x^2\Delta x(x+\Delta x)^2}\\
 & = &
```

```
\lim_{\Delta x\rightarrow 0}
\frac{-2x\Delta x-(\Delta x)^2}{x^2\Delta x(x+\Delta x)^2}\\
 & = & \lim_{\Delta x\rightarrow 0}\frac{-2x-\Delta x}{x^2(x+\Delta x)^2}\\
 & = & \frac{-2x}{x^2x^2}\\
 & = & -\frac{2}{x^3}
\end{eqnarray*}}

\newproblem{dfp:sqrtx}{%
Differentiate from first principles $f(x) = \surd x$}{%
\begin{eqnarray*}
\frac{df}{dx} & = &
\lim_{\Delta x\rightarrow 0}
\frac{\sqrt{x+\Delta x}-\surd x}{\Delta x}\\
 & = &
\lim_{\Delta x\rightarrow 0}
\frac{(\sqrt{x+\Delta x}-\surd x)(\sqrt{x+\delta x}+\surd x)}
     {\Delta x(\sqrt{x+\Delta x}+\surd x)}\\
 & = &
\lim_{\Delta x\rightarrow 0}
\frac{x+\Delta x - x}{\Delta x(\sqrt{x+\Delta x}+\surd x)}\\
 & = &
\lim_{\Delta x\rightarrow 0}
\frac{\Delta x}{\Delta x(\sqrt{x+\Delta x}+\Delta x)}\\
 & = & \lim_{\Delta x\rightarrow 0}\frac{1}{\sqrt{x+\Delta x}+\surd x}\\
 & = & \frac{1}{2\surd x}
\end{eqnarray*}}

\newproblem{dfp:cons}{%
Differentiate from first principles $f(x) = c$ where $c$ is a constant.}{%
\begin{eqnarray*}
\frac{df}{dx} & = & \lim_{\Delta x\rightarrow 0}\frac{c-c}{\Delta x}\\
 & = & \lim_{\Delta x\rightarrow 0}0\\
 & = & 0
\end{eqnarray*}}

\newproblem{dfp:cosx}{%
Given
\begin{eqnarray*}
\lim_{x \rightarrow 0} \frac{\cos x - 1}{x} & = & 0\\
\lim_{x \rightarrow 0} \frac{\sin x}{x} & = & 1
\end{eqnarray*}
differentiate from first principles $f(x) = \cos x$.}{%
\begin{eqnarray*}
\frac{df}{dx} & = &
\lim_{\Delta x \rightarrow 0}
\frac{f(x + \Delta x) - f(x)}{\Delta x}\\
 & = &
\lim_{\Delta x \rightarrow 0}
\frac{\cos(x + \Delta x) - \cos(x)}{\Delta x}\\
 & = &
\lim_{\Delta x \rightarrow 0}
\frac{\cos x\cos\Delta x - \sin x\sin\Delta x - \cos x}{\Delta x}\\
 & = &
\lim_{\Delta x \rightarrow 0}
\frac{\cos x(\cos\Delta x - 1) - \sin x\sin\Delta x}{\Delta x}\\
 & = & \cos x\lim_{\Delta x \rightarrow 0}\frac{\cos\Delta x - 1}{\Delta x}
      - \sin x\lim_{\Delta x \rightarrow 0}\frac{\sin\Delta x}{\Delta x}\\
 & = & -1 \qquad\mbox{(using given results)}
\end{eqnarray*}}
```

↓Code

File `args.tex`:

↑Code

```
% These problems require arguments

% Arguments: #1->a_2, #2->a_1 and #3->a_0
% (Arguments must be integers)
\newcount\ctr
\newproblem[3]{diff:quad}{%
\(f(x) =
\ifnum#1=0
\else
\ifnum#1=1\else#1\fi x^2
\fi
\ifnum#2=0
\else
\ifnum#2>0 \ifnum#1=0 \else + \fi \fi
\ifnum#2=1\else#2\fi x
\fi
\ifnum#3=0
\else
\ifnum#3>0 \ifnum#2=0 \ifnum#1=0 \else + \fi \else + \fi\fi
#3
\fi\)
}{%
\(f'(x) =
\ifnum#1=0
\else
\ctr=2
\multiply\ctr by #1
\the\ctr x
\fi
\ifnum#2=0
\else
\ifnum#2>0 \ifnum#1=0 \else + \fi \fi
#2
\fi
% print 0 if both #1 and #2 are 0
\ifnum#1=0 \ifnum#2=0 0 \fi\fi
\)
}

\newproblem[1]{diff:sin}{%
\(f(x) = \sin(#1x)\)
}{%
\(f'(x) = #1\cos(#1x)\)
}
```

↓Code

The result from the above example is shown in Figure 6.1.
The solution sheet can easily be obtained using `\showanswers`:

↑Code

```
\documentclass[a4paper]{article}

\usepackage{probsoln}

% use the current year as a random seed so that
% it produces a different set of problems each
% year.
%\PSNrandseed{\year}
```

1. Differentiate the following functions with respect to x:
   (a) $y = \tan x$
   (b) $y = (\tan x)^{-1} = \cot x$
   (c) $y = \cos(x^2)\sin x$.
   (d) $f(x) = g(x)\ln(g(x))$.
   (e) $y = \frac{\sin x}{x}$.
   (f) $y = \arccos x$.
2. Find $\frac{dy}{dx}$, given
$$y^2 = \frac{x^3}{2-x}$$
3. Given
$$\begin{aligned} \lim_{x\to 0} \frac{\cos x - 1}{x} &= 0 \\ \lim_{x\to 0} \frac{\sin x}{x} &= 1 \end{aligned}$$
   differentiate from first principles $f(x) = \cos x$.
4. Differentiate the following polynomials
   (a) $f(x) = 3x^2 - 2$
   (b) $f(x) = x^2 + 2x + 3$
   (c) $f(x) = 5x^2 + 3x$

Figure 6.1: Sample problem sheet using probsoln package

```
% or specify a fixed random seed.
\PSNrandseed{2004}

% Uncomment the following line to generate solution sheet.
\showanswers

\begin{document}
\ifthenelse{\boolean{showanswers}}{\textbf{Solution Sheet}}{}

\begin{enumerate}
\item Differentiate the following functions with respect to $x$:

\begin{enumerate}
\selectrandomly{easy.tex}{6}
\end{enumerate}

\selectrandomly{implicit.tex}{1}
\selectrandomly{1stprncp.tex}{1}

% The problems defined in arg.tex all take
% arguments.
\input{args.tex}

\item Differentiate the following polynomials
\begin{enumerate}
\item \useproblem{diff:quad}{3}{0}{-2}
\item \useproblem{diff:quad}{1}{2}{3}
\item \useproblem{diff:quad}{5}{3}{0}
\end{enumerate}

\end{enumerate}

\end{document}
```

↓Code

The result is shown in Figures 6.2, 6.3 and 6.4.

You can download probsex.tex, easy.tex, 1stprncp.tex and args.tex if you want to try out the above example. (You will also need to install probsoln[5]).

[5] http://theoval.cmp.uea.ac.uk/~nlct/latex/packages/index.html#probsoln

Solution Sheet

1. Differentiate the following functions with respect to x:

   (a) $y = \tan x$

   Solution:

$$\begin{aligned} y &= \tan x \\ &= \frac{\sin x}{\cos x} \\ \frac{dy}{dx} &= \frac{\cos x}{\cos x} + \sin x \times \frac{-1}{\cos^2 x} \times -\sin x \\ &= 1 + \tan^2 x \\ &= \sec^2 x. \end{aligned}$$

   (b) $y = (\tan x)^{-1} = \cot x$

   Solution:

$$\begin{aligned} \frac{dy}{dx} &= -(\tan x)^{-2} \sec^2 x \\ &= -\frac{\cos^2 x}{\sin^2 x} \cdot \frac{1}{\cos^2 x} \\ &= \frac{-1}{\sin^2 x} \\ &= -\csc^2 x. \end{aligned}$$

   (c) $y = \cos(x^2) \sin x$.

   Solution:

$$\frac{dy}{dx} = -\sin(x^2) 2x \sin x + \cos(x^2) \cos x$$

   (d) $f(x) = g(x) \ln(g(x))$.

   Solution:

$$\begin{aligned} f'(x) &= g'(x) \ln(g(x)) + \frac{g(x)}{g(x)} g'(x) \\ &= g'(x)(1 + \ln(g(x))). \end{aligned}$$

   (e) $y = \frac{\sin x}{x}$.

   Solution:

$$\frac{dy}{dx} = \frac{\cos x}{x} - \frac{\sin x}{x^2}$$

   (f) $y = \arccos x$.

Figure 6.2: Sample solution sheet using probsoln (Page 1)

Solution: $\cos y = x$ diff. w.r.t. x:

$$\begin{aligned} -\sin y \frac{dy}{dx} &= 1 \\ \frac{dy}{dx} &= \frac{-1}{\sin y} \\ &= \frac{-1}{\sqrt{1-\cos^2 y}} \\ &= \frac{-1}{\sqrt{1-x^2}} \end{aligned}$$

2. Find $\frac{dy}{dx}$, given

$$y^2 = \frac{x^3}{2-x}$$

Solution: Differentiating both sides w.r.t. x:

$$\begin{aligned} 2y\frac{dy}{dx} &= \frac{(2-x)3x^2 - x^3(-1)}{(2-x)^2} \\ &= \frac{3x^2(2-x)+x^3}{(2-x)^2} \\ &= \frac{6x^2-3x^3+x^3}{(2-x)^2} \\ &= \frac{6x^2-2x^3}{(2-x)^2} \\ &= 2x^2\frac{3-x}{(2-x)^2} \end{aligned}$$

Therefore

$$y\frac{dy}{dx} = x^2\frac{3-x}{(2-x)^2}$$

3. Given

$$\begin{aligned} \lim_{x\to 0}\frac{\cos x - 1}{x} &= 0 \\ \lim_{x\to 0}\frac{\sin x}{x} &= 1 \end{aligned}$$

differentiate from first principles $f(x) = \cos x$.

Solution:

$$\begin{aligned} \frac{df}{dx} &= \lim_{\Delta x\to 0}\frac{f(x+\Delta x)-f(x)}{\Delta x} \\ &= \lim_{\Delta x\to 0}\frac{\cos(x+\Delta x)-\cos(x)}{\Delta x} \end{aligned}$$

Figure 6.3: Sample solution sheet using probsoln (Page 2)

$$
\begin{aligned}
&= \lim_{\Delta x \to 0} \frac{\cos x \cos \Delta x - \sin x \sin \Delta x - \cos x}{\Delta x} \\
&= \lim_{\Delta x \to 0} \frac{\cos x(\cos \Delta x - 1) - \sin x \sin \Delta x}{\Delta x} \\
&= \cos x \lim_{\Delta x \to 0} \frac{\cos \Delta x - 1}{\Delta x} - \sin x \lim_{\Delta x \to 0} \frac{\sin \Delta x}{\Delta x} \\
&= -1 \qquad \text{(using given results)}
\end{aligned}
$$

4. Differentiate the following polynomials

   (a) $f(x) = 3x^2 - 2$

   Solution: $f'(x) = 6x$

   (b) $f(x) = x^2 + 2x + 3$

   Solution: $f'(x) = 2x + 2$

   (c) $f(x) = 5x^2 + 3x$

   Solution: $f'(x) = 10x + 3$

Figure 6.4: Sample solution sheet using probsoln (Page 3)

Chapter 7

Other Useful Class Files and Packages

Here are some other class files and packages you may find useful. If you don't have them installed on your system, they can be downloaded from the TEX Archive[1]. The files come with documentation and sample files, which you should look at if you are interested in using them.

- The facsimile class file by Torsten Bronger can be used to typeset faxes. A title page is created with a detailed fax header, and every page has a header with page number and total number of pages.
- The calendar bundle by Frank Bennett can be used to create calendars, timetables etc.
- The beamer class file by Till Tantau can be used to create very professional looking presentations with a data projector.

[1] http://www.tex.ac.uk/

Chapter 8

TeXnicCenter Templates

If you are using `TeXnicCenter`, you can create your own templates for different types of document. You can find, and set, the directories where the templates are located using the Tools → Options menu (See Figure 8.1). This is usually in `c:\Program Files\TeXnicCenter\Templates\Projects\`, for projects, and `c:\Program Files\TeXnicCenter\Templates\Documents\` for documents.

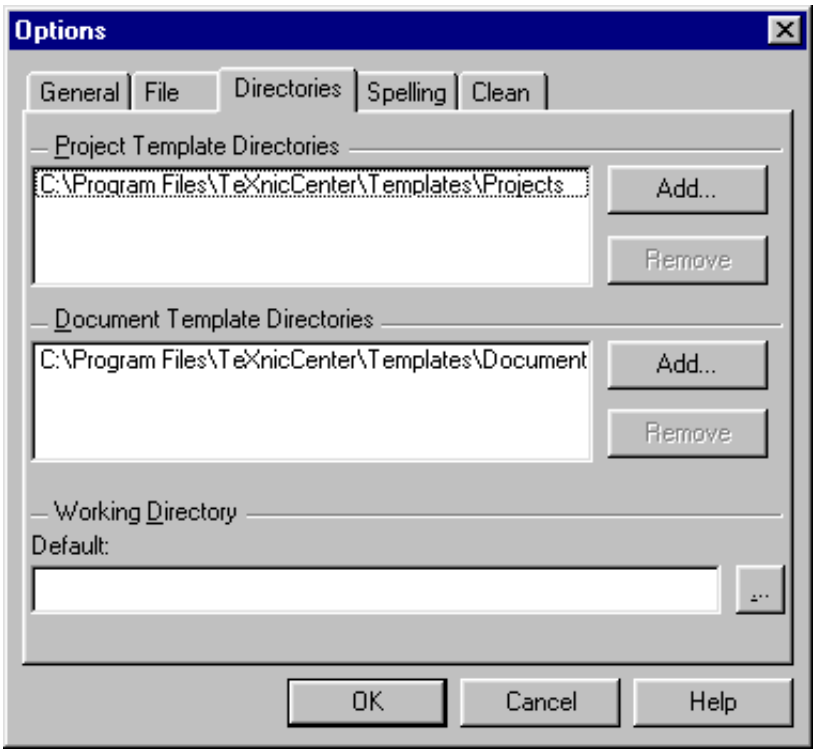

Figure 8.1: TeXnicCenter Template Directories

By default, there is usually only the empty project template (see Figure 8.2), but others can be added into subdirectories of the project templates directory. For example, suppose you want to create a template for a basic letter using the uealettr class file, described in Chapter 2, and also a template for letters using mail merging, as described in Section 2.1. First, create the subdirectory `c:\Program Files\TeXnicCenter\Templates\Projects\letters`[1], and then you need to save the templates into this directory. To create a template, you simply need to type up the skeletal document structure, and then save it to the directory you have just made.

1. To create a template for a basic document using uealettr, start a new document and type something like the following:

[1] or you could use `correspondence` instead of `letters`, the choice is entirely up to you.

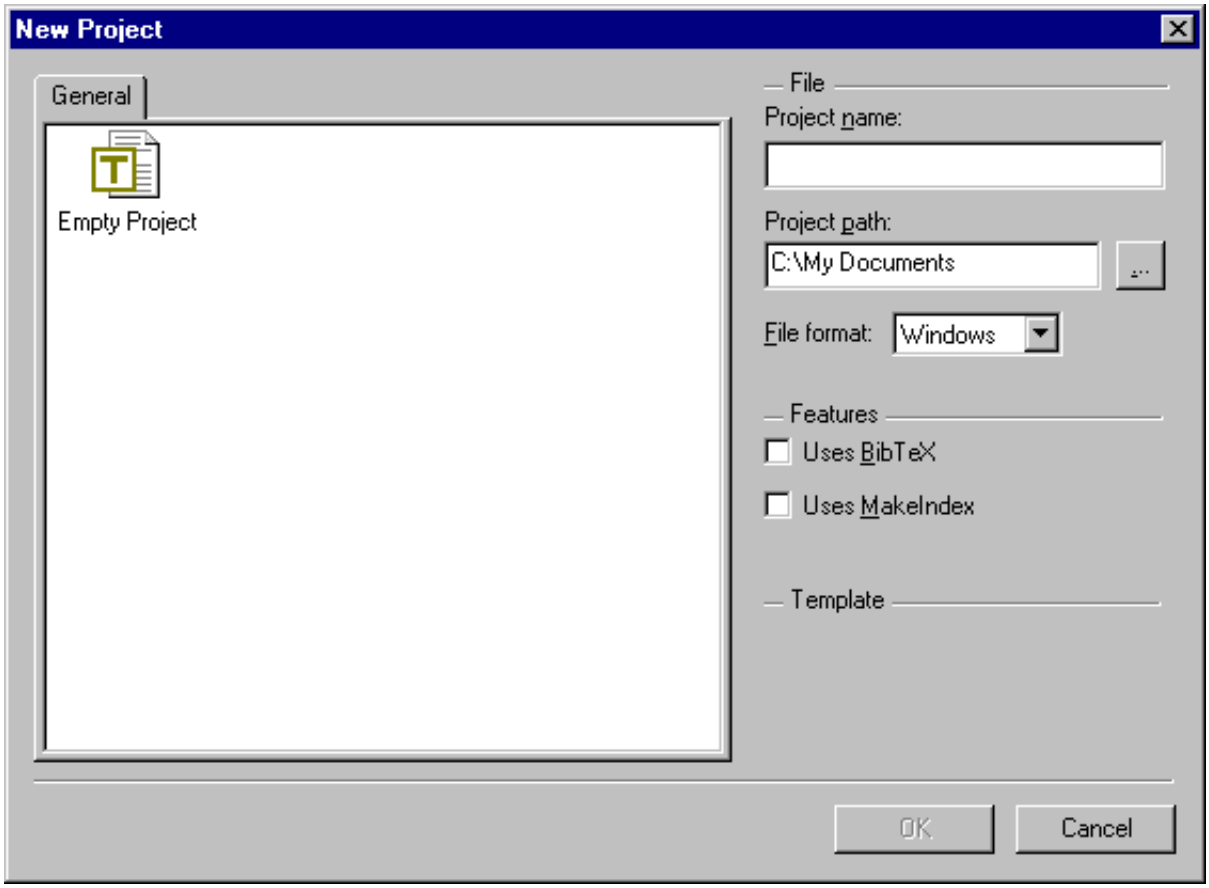

Figure 8.2: Default Template

```
\documentclass{uealettr}

% Sender details

\signature{Dr Nicola Talbot}
%\division{}
\location{School of Computing Sciences}
\telephone{01603 492158}
%\directdial{}
%\fax{}
\email{nlct@cmp.uea.ac.uk}

% Letter details
\subject{}
\myref{}
\yourref{}

\begin{document}

% Argument to letter environment should be recipient's name and address

\begin{letter}{}

%e.g. \opening{Dear Sir}
\opening{}

% Main body of letter goes here

%e.g. \closing{Yours Faithfully}
\closing{}

%\cc{}
%\enc{}
%\ps

\end{letter}

\end{document}
```

and then save it as, say, `uealetter.tex`.

2. To create a template for a letter using mail merging, start a new document and type something like:

```
\documentclass{uealettr}

\usepackage{csvtools}

% Sender details

\signature{Dr Nicola Talbot}
%\division{}
\location{School of Computing Sciences}
\telephone{01603 492158}
%\directdial{}
%\fax{}
\email{nlct@cmp.uea.ac.uk}

% Letter details
```

```
\subject{}
\myref{}
\yourref{}

\begin{document}

% \applyCSVfile{filename}{letter}
% use \insert... where ... is the text given in the appropriate column of the header row
% If CSV file does not have a header row, use \applyCSVfile*
% use \field{n} where n is the column number

\applyCSVfile{filename.csv}{
% Argument to letter environment should be recipient's name and address
\begin{letter}{}

%e.g. \opening{Dear Sir}
\opening{}

% Main body of letter goes here

%e.g. \closing{Yours Faithfully}
\closing{}

%\cc{}
%\enc{}
%\ps

\end{letter}}

\end{document}
```

and then save it as, say, `mailmerge.tex`

The next time you create a new project, the dialogue box will have an extra tab called `letters`. If you click on this tab, you should now see the two new templates you have just created. If you want to create a basic letter, instead of selecting the empty project, you can now select the `uealetter` project.

You can do something similar for assignments, tests, exams and marksheets. This time, you could create a subdirectory called, say, `courseunit` instead of `letter`, and create separate templates that use the ueaassig, ueatest, ueaexam and marksheet class files.

8.1 Sample Templates

You can download the following sample templates, and edit them as appropriate:

- Projects/letters/uealetter
- Projects/letters/mailmerge
- Projects/courseunit/assignment
- Projects/courseunit/coursetest
- Projects/courseunit/exam
- Projects/courseunit/marksheet

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