

Fixing \LaTeX errors

L^AT_EX documents often cause error messages

\LaTeX documents often cause error messages and sometimes things can go wrong with the installation of the software.

\LaTeX documents often cause error messages and sometimes things can go wrong with the installation of the software.

Getting used to error messages and fixing problems is very useful.

Examples of \LaTeX errors

Most often, errors are just due to bad \LaTeX code.

Most often, errors are just due to bad \LaTeX code. Error message alerts show up just above the output pane in Overleaf.

Most often, errors are just due to bad \LaTeX code. Error message alerts show up just above the output pane in Overleaf.

Unfortunately, \LaTeX 's error messages aren't always the clearest, though Overleaf does a good job of trying to help.

! Missing \$ inserted.

<inserted text>

1.55 \item Let $f(x) = a_0 + a_1x + a_2x^2 + a_3x^3$ and $g(x) = b_0 + b_1x + b_2x^2$. F...

I've inserted a `begin-math/end-math` symbol since I think you left one out.

! Missing \$ inserted.

<inserted text>

1.55 \item Let $f(x) = a_0 + a_1x + a_2x^2 + a_3x^3$ and $g(x) = b_0 + b_1x + b_2x^2$. F...

I've inserted a `begin-math/end-math` symbol since I think you left one out.

This is maths symbols used not in math-mode (in this case, the `_` symbol).

! LaTeX Error: \begin{enumerate} on input
line 74 ended by \end{document}.

See the LaTeX manual or LaTeX Companion
for explanation.

Type H <return> for immediate help.

...

! LaTeX Error: \begin{enumerate} on input
line 74 ended by \end{document}.

See the LaTeX manual or LaTeX Companion
for explanation.

Type H <return> for immediate help.

...

This is a forgotten \end{enumerate}.

Runaway argument?

```
{Maclaurin and Taylor series, drawing
  attention to the $x-a$ in the d\ETC.
! File ended while scanning use of \emph
```

```
<inserted text>
```

```
\par
```

```
<*> ...10*Maclaurin*series/10
  _maclaurin_series.tex
```

I suspect you have forgotten a '}',
causing me to read past where you
wanted me to stop.

Runaway argument?

```
{Maclaurin and Taylor series, drawing
  attention to the $x-a$ in the d\ETC.
! File ended while scanning use of \emph
```

```
.
<inserted text>
```

```
          \par
<*> ...10*Maclaurin*series/10
      _maclaurin_series.tex
```

I suspect you have forgotten a '}',
causing me to read past where you
wanted me to stop.

This is a forgotten }.

! LaTeX Error: Environment enumcreate
undefined.

See the LaTeX manual or LaTeX Companion
for explanation.

Type H <return> for immediate help.

...

1.54 \begin{enumcreate}

Your command was ignored.

! LaTeX Error: Environment enumreate
undefined.

See the LaTeX manual or LaTeX Companion
for explanation.

Type H <return> for immediate help.

...

1.54 \begin{enumreate}

Your command was ignored.

This is a misspelling of 'enumerate'.

Many \LaTeX errors will be a variation on one of the above examples.

Common \LaTeX let-downs

Activity. More proof-reading! The document on the course website in the Week 5 Presentation Materials has a number of problems with it. Find as many ways of improving the document as you can.

Before we identify the errors in the document, let's discuss some common problems.

Maths not in math-mode

Maths not in math-mode

When using inline maths, it is easy to forget the single dollars.

Maths not in math-mode

When using inline maths, it is easy to forget the single dollars.
Look out for maths symbols not displayed in italics.

Maths not in math-mode

When using inline maths, it is easy to forget the single dollars.
Look out for maths symbols not displayed in italics.

Examples.

This x is correct, whereas this x is not.

Maths not in math-mode

When using inline maths, it is easy to forget the single dollars. Look out for maths symbols not displayed in italics.

Examples.

This x is correct, whereas this x is not. This $f(x)$ is wrong as well,

Maths not in math-mode

When using inline maths, it is easy to forget the single dollars. Look out for maths symbols not displayed in italics.

Examples.

This x is correct, whereas this x is not. This $f(x)$ is wrong as well, as is this set A , which is better as A .

Text in math-mode

Text in math-mode

The reverse situation is using text in math-mode.

Text in math-mode

The reverse situation is using text in math-mode. This is easy to spot, as the text becomes italic and spacing isn't correct.

Text in math-mode

The reverse situation is using text in math-mode. This is easy to spot, as the text becomes italic and spacing isn't correct.

Examples.

This text is in math – mode.

Text in math-mode

The reverse situation is using text in math-mode. This is easy to spot, as the text becomes italic and spacing isn't correct.

Examples.

This text is in math – mode.

This line is also in math – mode, with \sim used for spaces.

Text in math-mode

The reverse situation is using text in math-mode. This is easy to spot, as the text becomes italic and spacing isn't correct.

Examples.

This text is in math – mode.

This line is also in math – mode, with ~ used for spaces.

The first case here may have happened by accident.

Text in math-mode

The reverse situation is using text in math-mode. This is easy to spot, as the text becomes italic and spacing isn't correct.

Examples.

This text is in math – mode.

This line is also in math – mode, with ~ used for spaces.

The first case here may have happened by accident. The second is someone fiddling to make things look OK, but is bad practice.

It is rare that text is needed within math-mode, but if it's unavoidable, use the `\text{...}` command.

It is rare that text is needed within math-mode, but if it's unavoidable, use the `\text{...}` command.

Example.

The `\text` command allows us to write

$$x = u + v \quad \text{and} \quad y = u - v.$$

It is rare that text is needed within math-mode, but if it's unavoidable, use the `\text{...}` command.

Example.

The `\text` command allows us to write

$$x = u + v \quad \text{and} \quad y = u - v.$$

Notice the spacing between the maths and text.

It is rare that text is needed within math-mode, but if it's unavoidable, use the `\text{...}` command.

Example.

The `\text` command allows us to write

$$x = u + v \quad \text{and} \quad y = u - v.$$

Notice the spacing between the maths and text. This has been done using the `\quad` command, which creates a large space:

It is rare that text is needed within math-mode, but if it's unavoidable, use the `\text{...}` command.

Example.

The `\text` command allows us to write

$$x = u + v \quad \text{and} \quad y = u - v.$$

Notice the spacing between the maths and text. This has been done using the `\quad` command, which creates a large space:

```
$$x=u+v\quad\text{and}\quad y=u-v.$$
```

It is rare that text is needed within math-mode, but if it's unavoidable, use the `\text{...}` command.

Example.

The `\text` command allows us to write

$$x = u + v \quad \text{and} \quad y = u - v.$$

Notice the spacing between the maths and text. This has been done using the `\quad` command, which creates a large space:

```
$$x=u+v\quad\text{and}\quad y=u-v.$$
```

The `\text` command needs the `amsmath` package.

Punctuation in the wrong place

Punctuation in display-math (that is, $\$$) can sometimes slip to the next line.

Punctuation in the wrong place

Punctuation in display-math (that is, $\$$) can sometimes slip to the next line.

Example.

Thus,

$$\sin^2 x + \cos^2 x = 1$$

Punctuation in the wrong place

Punctuation in display-math (that is, $\$$) can sometimes slip to the next line.

Example.

Thus,

$$\sin^2 x + \cos^2 x = 1$$

.

Punctuation in the wrong place

Punctuation in display-math (that is, $\$$) can sometimes slip to the next line.

Example.

Thus,

$$\sin^2 x + \cos^2 x = 1$$

.

If using display-math, the punctuation must go inside the $\$$.

Punctuation in the wrong place

Punctuation in display-math (that is, $\$$) can sometimes slip to the next line.

Example.

Thus,

$$\sin^2 x + \cos^2 x = 1$$

.

If using display-math, the punctuation must go inside the $\$$. This ensures it stays on the same line, as in

Punctuation in the wrong place

Punctuation in display-math (that is, $\$$) can sometimes slip to the next line.

Example.

Thus,

$$\sin^2 x + \cos^2 x = 1$$

.

If using display-math, the punctuation must go inside the $\$$. This ensures it stays on the same line, as in

Thus,

$$\sin^2 x + \cos^2 x = 1$$

Punctuation in the wrong place

Punctuation in display-math (that is, $\$$) can sometimes slip to the next line.

Example.

Thus,

$$\sin^2 x + \cos^2 x = 1$$

.

If using display-math, the punctuation must go inside the $\$$. This ensures it stays on the same line, as in

Thus,

$$\sin^2 x + \cos^2 x = 1.$$

Conversely, it is better to put punctuation outside of single-dollars.

Conversely, it is better to put punctuation outside of single-dollars. This helps with readability of the \LaTeX file.

Conversely, it is better to put punctuation outside of single-dollars. This helps with readability of the \LaTeX file. The document displays the same either way in this case.

Conversely, it is better to put punctuation outside of single-dollars. This helps with readability of the \LaTeX file. The document displays the same either way in this case.

Example.

Therefore $x=2$.

Conversely, it is better to put punctuation outside of single-dollars. This helps with readability of the \LaTeX file. The document displays the same either way in this case.

Example.

Therefore $x=2\$$.

is preferred to

Therefore $x=2.\$$

Conversely, it is better to put punctuation outside of single-dollars. This helps with readability of the \LaTeX file. The document displays the same either way in this case.

Example.

Therefore $\$x=2\$$.

is preferred to

Therefore $\$x=2.\$$

Both display as

Therefore $x = 2$.

Using too many paragraphs

Some people have a habit of starting each new sentence as a new paragraph.

Using too many paragraphs

Some people have a habit of starting each new sentence as a new paragraph. (Remember, a new paragraph in \LaTeX is achieved with a blank line space.)

Using too many paragraphs

Some people have a habit of starting each new sentence as a new paragraph. (Remember, a new paragraph in \LaTeX is achieved with a blank line space.) This can make the text hard to read quickly.

Using too many paragraphs

Some people have a habit of starting each new sentence as a new paragraph. (Remember, a new paragraph in \LaTeX is achieved with a blank line space.) This can make the text hard to read quickly.

Try to use paragraphs appropriately, with each new paragraph representing a change of idea or step forward.

Example.

Let $y = e^x \cos x$.

Differentiating, $\frac{dy}{dx} = e^x(\cos x - \sin x)$.

Thus, $\frac{dy}{dx} = 0$ if and only if $e^x(\cos x - \sin x) = 0$.

Since $e^x > 0$ for all x , it follows that...

Example.

Let $y = e^x \cos x$.

Differentiating, $\frac{dy}{dx} = e^x(\cos x - \sin x)$.

Thus, $\frac{dy}{dx} = 0$ if and only if $e^x(\cos x - \sin x) = 0$.

Since $e^x > 0$ for all x , it follows that...

Is better as

Let $y = e^x \cos x$. Differentiating, $\frac{dy}{dx} = e^x(\cos x - \sin x)$.

Thus, $\frac{dy}{dx} = 0$ if and only if $e^x(\cos x - \sin x) = 0$. Since $e^x > 0$ for all x , it follows that...

Using too much display-math

Beginners to \LaTeX often overuse display-math ($\$$).

Using too much display-math

Beginners to \LaTeX often overuse display-math ($\$$ $\$$).

Display-math should be used for important steps that you would like to stand out, or for formulas and equations too big to display well in-line.

Using too much display-math

Beginners to \LaTeX often overuse display-math ($\$$ $\$$).

Display-math should be used for important steps that you would like to stand out, or for formulas and equations too big to display well in-line.

Too much display-math slows the reader down.

Using too much display-math

Beginners to \LaTeX often overuse display-math ($\$$ $\$$).

Display-math should be used for important steps that you would like to stand out, or for formulas and equations too big to display well in-line.

Too much display-math slows the reader down.

Here's an example of something broken up too much by display-math.

Example.

Suppose not, and $\sqrt{2}$ is rational. Then, by Lemma 1.2,

$$\sqrt{2} = \frac{a}{b},$$

where a and b share no common factors. Thus, squaring,

$$2b^2 = a^2.$$

It follows that a^2 is even, and hence so is a . Write

$$a = 2m$$

for some $m \in \mathbb{Z} \dots$

Re-write: Suppose not, and $\sqrt{2}$ is rational. Then, by Lemma 1.2, $\sqrt{2} = \frac{a}{b}$, where a and b share no common factors. Thus, squaring, $2b^2 = a^2$. It follows that a^2 is even, and hence so is a . Write $a = 2m$ for some $m \in \mathbb{Z} \dots$

Not writing in full sentences

Mathematicians often try to save time when writing by hand,

Not writing in full sentences

Mathematicians often try to save time when writing by hand, adding little notes, and these might not be written in full sentences.

Not writing in full sentences

Mathematicians often try to save time when writing by hand, adding little notes, and these might not be written in full sentences.

When typing mathematics you should write *everything* in full sentences.

Not writing in full sentences

Mathematicians often try to save time when writing by hand, adding little notes, and these might not be written in full sentences.

When typing mathematics you should write *everything* in full sentences.

Example.

If $y = \sin(x) \cos(x)$ then $y' = \cos^2(x) - \sin^2(x)$ (product rule). Sub in $x = \theta/2$. Then...

Not writing in full sentences

Mathematicians often try to save time when writing by hand, adding little notes, and these might not be written in full sentences.

When typing mathematics you should write *everything* in full sentences.

Example.

If $y = \sin(x) \cos(x)$ then $y' = \cos^2(x) - \sin^2(x)$ (product rule). Sub in $x = \theta/2$. Then...

is better as

If $y = \sin(x) \cos(x)$ then $y' = \cos^2(x) - \sin^2(x)$ (using the product rule). Substitute in $x = \theta/2$. Then...

Using bold text

As explained in an earlier lecture, \LaTeX is a mark-up language.

Using bold text

As explained in an earlier lecture, \LaTeX is a mark-up language. The best approach is to use \LaTeX to tell the computer what kind of thing your text is, rather than specifically how to display it.

Using bold text

As explained in an earlier lecture, \LaTeX is a mark-up language. The best approach is to use \LaTeX to tell the computer what kind of thing your text is, rather than specifically how to display it.

Bold text is almost never used in sentences, where the `\emph{...}` command (meaning 'emphasised text') is used instead.

Using bold text

As explained in an earlier lecture, \LaTeX is a mark-up language. The best approach is to use \LaTeX to tell the computer what kind of thing your text is, rather than specifically how to display it.

Bold text is almost never used in sentences, where the $\text{\emph{\{ . . . \}}}$ command (meaning ‘emphasised text’) is used instead. Bold should be kept for, say, headings in tables or leading words such as ‘**Note:** . . .’.

Overfull hboxes

L^AT_EX creates documents with fully-justified text (i.e. text stretched from the left margin to the right).

Overfull hboxes

\LaTeX creates documents with fully-justified text (i.e. text stretched from the left margin to the right).

Usually \LaTeX does this well, and doesn't like to stretch the space between the words too much.

Overfull hboxes

\LaTeX creates documents with fully-justified text (i.e. text stretched from the left margin to the right).

Usually \LaTeX does this well, and doesn't like to stretch the space between the words too much. Sometimes it chooses to spill over the right margin slightly.

Overfull hboxes

\LaTeX creates documents with fully-justified text (i.e. text stretched from the left margin to the right).

Usually \LaTeX does this well, and doesn't like to stretch the space between the words too much. Sometimes it chooses to spill over the right margin slightly. If this happens, you will get a warning about an 'overfull hbox' in the log-file.

Example.

Overfull hboxes can happen with

looo
words.

To fix this, slightly reword the sentence; usually \LaTeX finds a better way to split the lines.

Example.

Overfull hboxes can happen with

looo
words.

To fix this, slightly reword the sentence; usually \LaTeX finds a better way to split the lines. If the overfull hbox is very slight, you might choose to ignore it.

Unlinked references

We have used the `\label{...}` and `\ref{...}` commands to label and reference equations,

Unlinked references

We have used the `\label{...}` and `\ref{...}` commands to label and reference equations, and also `\cite{...}` command to reference a book.

Unlinked references

We have used the `\label{...}` and `\ref{...}` commands to label and reference equations, and also `\cite{...}` command to reference a book.

The first time a \LaTeX file is processed it displays ? instead of the correct reference number.

Unlinked references

We have used the `\label{...}` and `\ref{...}` commands to label and reference equations, and also `\cite{...}` command to reference a book.

The first time a \LaTeX file is processed it displays ? instead of the correct reference number. After processing the file twice, the correct number will appear. (Overleaf always processes the file twice as a precaution).

Unlinked references

We have used the `\label{...}` and `\ref{...}` commands to label and reference equations, and also `\cite{...}` command to reference a book.

The first time a \LaTeX file is processed it displays ? instead of the correct reference number. After processing the file twice, the correct number will appear. (Overleaf always processes the file twice as a precaution). Keep an eye out for these missing references, and if necessary process the file again.

Activity. More proof-reading! The document on the course website in the Week 5 Presentation Materials has a number of problems with it. Find as many ways of improving the document as you can.

First mini-project to launch next week!

Please pay attention to the Week 6 Presentation lecture next week, as the first mini-project will be launched then (to be handed in in Week 8).

About Computer Lab 5

In Computer Lab 5 we'll look at a few \LaTeX tips and tricks that we haven't covered yet, including aligned equations, tables and more.