

Writing Equations in \LaTeX

Spoken Tutorial

<http://spoken-tutorial.org>

National Mission on Education through ICT

<http://www.sakshat.ac.in>

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Learning Objectives

1. How to write *an* equation in \LaTeX



Learning Objectives

1. **How to write *an* equation in \LaTeX**
2. **How to write *multiple* equations**



Learning Objectives

1. How to write *an* equation in \LaTeX
2. How to write *multiple* equations
3. How to *align* multiple equations



Learning Objectives

1. How to write *an* equation in \LaTeX
2. How to write *multiple* equations
3. How to *align* multiple equations
4. Why avoid \$ mode and blank lines



System Requirements

- ▶ Works on Ubuntu, Windows and Mac
- ▶ TeXworks, and \LaTeX
- ▶ Can use without TeXworks also
- ▶ Other Linux systems are also ok



Prerequisites

- ▶ Spoken tutorials that introduce \LaTeX



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- ▶ Exposure to the side-by-side method



Prerequisites

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- ▶ Exposure to the side-by-side method
- ▶ All available from
<https://spoken-tutorial.org>



Additional Learning Material

- ▶ I shall use the file `equations.tex`

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- ▶ **I shall use the file** `equations.tex`
- ▶ **It is available as a code file along with this tutorial**

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- ▶ If you don't have it, you can find it at <https://spoken-tutorial.org>

A Standard Reference

**\LaTeX - A Document Preparation System
User's Guide and Reference Manual
Pearson Education, New Delhi
Second Edition, 1994
Price: About ₹500**



What did we learn?

- ▶ Create equations using `align`
- ▶ Why avoid `$` and blank lines
- ▶ Align equations using `&`
- ▶ Insert text between eqn. with `intertext`
- ▶ If there is no text in between equations, use `\\`



What did we learn?

- ▶ Create equations using `align`
- ▶ Why avoid `$` and blank lines
- ▶ Align equations using `&`
- ▶ Insert text between eqn. with `intertext`
- ▶ If there is no text in between equations, use `\\`

Assignment 1: Recall all of the above



More Assignments



2. Create these equations

$$a = b + c$$

$$abcd = f + g + h$$



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$$a = b + c$$

$$abcd = f + g + h$$

These equations are created by

```
\begin{align*}
a = b + c \\
abcd = f + g + h
\end{align*}
```



3. Align them

Align the equations as given here:

$$a = b + c$$

$$abcd = f + g + h$$



4. What if you forget &

Suppose you forget & in second equation:

```
\begin{align*}
a &= b + c \\
abcd = f + g + h
\end{align*}
```



4. What if you forget &

Suppose you forget & in second equation:

```
\begin{align*}
a &= b + c \\
abcd &= f + g + h
\end{align*}
```

You get this output:

$$a = b + c$$
$$abcd = f + g + h$$



5. Align differently

How do you produce the following?

$$a = b + c$$

$$abcd = f + g + h$$

Hint: `&` should be put in a different place!



6. Align three equations

$$\alpha = \beta + \gamma \quad (1)$$

$$\alpha + \beta = \frac{\gamma}{\delta} + \delta \int \mu d\mu \quad (2)$$

$$\alpha + \beta\mu = \gamma\delta \quad (3)$$



6. Align three equations

$$\alpha = \beta + \gamma \quad (1)$$

$$\alpha + \beta = \frac{\gamma}{\delta} + \delta \int \mu d\mu \quad (2)$$

$$\alpha + \beta\mu = \gamma\delta \quad (3)$$

```
\begin{align}
```

```
\alpha & = \beta + \gamma \ \backslash
```

```
\alpha + \beta & = \frac{\gamma}{\delta} + \delta \int \mu d\mu \ \backslash
```

```
\alpha + \beta\mu & = \gamma\delta
```

```
\end{align}
```



7. Put text in between equations

Insert some text between equations:

$$\alpha = \beta + \gamma \tag{1}$$

$$\alpha + \beta = \frac{\gamma}{\delta} + \delta \int \mu d\mu \tag{2}$$

$$\alpha + \beta\mu = \gamma\delta \tag{3}$$



About the Spoken Tutorial Project



About the Spoken Tutorial Project

- ▶ **Watch the video available at**
https://spoken-tutorial.org/What_is_a_Spoken_Tutorial
- ▶ **It summarises the Spoken Tutorial project**
- ▶ **If you do not have good bandwidth, you can download and watch it**



Spoken Tutorial Workshops

The Spoken Tutorial Project Team

- ▶ Conducts workshops using spoken tutorials
- ▶ Gives certificates to those who pass an online test

For more details, please write to

contact@spoken-tutorial.org



Answers for THIS Spoken Tutorial

- ▶ Questions in THIS Spoken Tutorial?



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You will have to register to ask questions



Where to post \LaTeX questions?

- ▶ For topics not covered in spoken tutorials, visit <http://tex.stackexchange.com/>
- ▶ This is a great place to get answers



Contact us for general questions

- ▶ You may have questions on workshops, certificates, etc.
- ▶ For this, get in touch with us at **contact@spoken-tutorial.org**



Acknowledgements

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- ▶ **National Mission on Education through ICT (NMEICT)**
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Thanks!

