# Writing Thesis and Paper in LaTeX

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# Writing your first piece of LaTeX

**Example**

```
\documentclass{article}
\begin{document}
First document. This is a simple example, with no
extra parameters or packages included.
\end{document}
```

First document. This is a simple example, with no extra parameters or packages included.

# Adding images

## Example

```
\usepackage{graphicx}
\begin{array}{cc}
\includegraphics[width=40.25]{Pictures1/SETU1} &
\qquad\qquad\qquad\includegraphics[width=40.25]
{Pictures1/SETU2} \\\text{University of Basrah} &
\qquad\qquad\qquad\text
{University of Basrah/College of Science}
\end{array}
```


University of Basrah


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# Abstract

In scientific documents it's a common practice to include a brief overview of the main subject of the paper.

**Example**

```
\begin{abstract}
This is a simple paragraph at the beginning of the
document. A brief introduction about the main subject.
\end{abstract}
```


## Abstract

This is a simple paragraph at the beginning of the document. A brief introduction about the main subject.

# Bold, italics and underlining

**Example**

```
Some of the \textbf{greatest}
discoveries in \underline{science}
were made by \textbf{\textit{accident}}.
```

Some of the **greatest** discoveries in <u>science</u> were made by ***accident***.

# Creating lists in LaTeX

**Example**

Unordered lists

```
\begin{itemize}
  \item The individual entries are indicated
   with a black dot, a so-called bullet.
  \item The text in the entries may be of any length.
\end{itemize}
```

- The individual entries are indicated with a black dot, a so-called bullet.
- The text in the entries may be of any length.

# Creating lists in LaTeX

**Example**

Ordered lists

```
\begin{enumerate}
  \item This is the first entry in our list.
  \item The list numbers increase with each entry we add.
\end{enumerate}
```

1. This is the first entry in our list.
2. The list numbers increase with each entry we add.

# Adding math to LaTeX

## Example

Using $...$ and \[ ... \]

```
In physics, the mass-energy equivalence is stated
by the equation $E=mc^2$, discovered in 1905 by
Albert Einstein.
In natural units ($c = 1$), the formula expresses
the identity
```

$$E = m$$

In physics, the mass-energy equivalence is stated by the equation $E = mc^2$, discovered in 1905 by Albert Einstein. In natural units ($c = 1$), the formula expresses the identity

$$E = m$$

.

# Adding math to LaTeX

Many math mode commands require the amsmath package, so be sure to include it when writing math.

## Example

```
\begin{equation} ...\end{equation}
\begin{equation}
\int_0^1 \frac{1}{e^x}=\frac{e-1}{e}.
\end{equation}
\begin{equation*}
\sin^2(\alpha+\cos^2(\alpha)=1.
\end{equation*}
```

$$\int_0^1 \frac{1}{e^x} = \frac{e-1}{e}. \tag{0.1}$$

$$\sin^2(\alpha) + \cos^2(\alpha) = 1.$$

# Creating tables

## Creating a simple table in LaTeX

### Example

```
\begin{center}
\begin{tabular}{ c c c }
 cell1 & cell2 & cell3 \\
 cell4 & cell5 & cell6 \\
 cell7 & cell8 & cell9
\end{tabular}
\end{center}
```

| | | |
|---|---|---|
| cell1 | cell2 | cell3 |
| cell4 | cell5 | cell6 |
| cell7 | cell8 | cell9 |

# Creating Matrix

## Example

```
A=\left(
  \begin{array}{ccc}
    r_11 & r_12 & r_13 \\
    r_21 & r_22 & r_23 \\
  \end{array}
\right)
\qquad B=\left[
  \begin{array}{ccc}
    r_11 & r_12 & r_13 \\
    r_21 & r_22 & r_23 \\
  \end{array}
\right]
```

$$A=\begin{pmatrix} r_{11} & r_{12} & r_{13} \\ r_{21} & r_{22} & r_{23} \end{pmatrix} \qquad B=\begin{bmatrix} r_{11} & r_{12} & r_{13} \\ r_{21} & r_{22} & r_{23} \end{bmatrix}$$

# Creating tables

## Adding borders

### Example

```
\begin{center}
\begin{tabular}{ |c |c |c|| }
\hline
 cell1 & cell2 & cell3 \\
 \hline
 \hline
 cell4 & cell5 & cell6 \\
 \hline
\end{tabular}
\end{center}
```

| cell1 | cell2 | cell3 |
|---|---|---|
| cell4 | cell5 | cell6 |

# Captions, labels and references

## Example

```
Table \ref{table1} is an example of referenced
 \LaTeX elements.
\begin{table}[h!]
\centering
\begin{tabular}{||c c c c||}
 \hline
 Col1 & Col2 & Col2 & Col3 \ [0.5ex]
 \hline\hline
 1 & 6 & 87837 & 787 \\
 5 & 88 & 788 & 6344 \\ [4ex]
$\cos x$ & $\int_{1}^{3}(x^{2}+1)dx$ & $\sqrt[5]{33}$ &
$\binom{5}{2}$ \ [1ex]\\ [1ex]
 \hline
\end{tabular}
\caption{Table to test captions and labels}
\label{table1}
\end{table}
```

Table 1 is an example of referenced LaTeX elements.

| Col1 | Col2 | Col2 | Col3 |
|---|---|---|---|
| 1 | 6 | 87837 | 787 |
| 5 | 88 | 788 | 6344 |
| $\cos x$ | $\int_1^3 (x^2+1)dx$ | $\sqrt[5]{33}$ | $\binom{5}{2}$ |

Table 1: Table to test captions and labels

# Thanks

THANK YOU