

# A L<sup>A</sup>T<sub>E</sub>X Document Templates

Ross

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## 1. Random Text

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis. Pellentesque cursus luctus mauris.

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

## 2. Common Eenvironment

### 2.1 List

#### 2.1.1 Unordered list

- Sth
- Sth
- ...

#### 2.1.2 Ordered list

- (1) Sth
- (2) Sth
- (3) ...

More beautiful by using **1**

**12**

- Sth
- Sth
- ...

```
\begin{mybox}{12}  
  \begin{itemize}[leftmargin = 10pt]  
    \item Sth  
    \item Sth  
    \item $\cdots$  
  \end{itemize}  
\end{mybox}
```

Listing 1 *mybox*

## 2.2 Table

**Table 1** *This is a table*

NUMBER	NAME	AGE	ID	GENDER
001	*	*	*	*
002	*	*	*	*
003	*	*	*	*
004	*	*	*	*
005	*	*	*	*

```

\begin{table}[ht]
  \centering
  \begin{center}
    \caption{\em This is a table}
    \vskip 0.1in
    \label{table}
    \begin{tabular}{c|cccc}
      \hline
      \hline
      \rule{0pt}{3ex}
      NUMBER & NAME & AGE & ID & GENDER
      \rule[-1.2ex]{0pt}{0pt} \\\hline
      001 & * & * & * & * \\
      002 & * & * & * & * \\
      003 & * & * & * & * \\
      004 & * & * & * & * \\
      005 & * & * & * & * \\
      \hline
      \hline
    \end{tabular}
  \end{center}
\end{table}

```

**Listing 2** *Table*

## 2.3 Figure

### 2.3.1 figure



**Figure 1** *figure*

### 2.3.2 subfigure



**(a)** *subfigure 1*



**(b)** *subfigure 2*

**Figure 2** *subfigure*

```
\begin{figure} [H]
  \centering
  \begin{subfigure} {.48\textwidth}
    \centering
    % include first image
    \includegraphics[width=.5\linewidth]{google.png}
    \caption{\em subfigure 1}
    \label{fig:v21}
  \end{subfigure}
  \begin{subfigure} {.48\textwidth}
    \centering
    % include second image
    \includegraphics[width=.5\linewidth]{google.png}
    \caption{\em subfigure 2}
    \label{fig:v22}
  \end{subfigure}
  \caption{\em subfigure}
  \label{fig:v2}
\end{figure}
```

**Listing 3** *Subfigure*

### 3. Theorem Class Environments

**Definition 3.1****Lemma 3.1****Theorem 3.1**

*Case 1.*

*Case 2.*

*Remark 3.1.*

**Corollary 3.1**

**Example 3.1.**

**Proof.**

■

## 4. Math Equations

$$\int x^2 \mathrm{d}x$$

To prove  $a = b$ , we need to prove

**No number**

$$a < b + \epsilon, b < a + \epsilon.$$

**Numbered**

$$a < b + \epsilon, b < a + \epsilon. \tag{1}$$

PNP/Stokes equations

$$\left\{ \begin{array}{l} \partial_t - \nabla \cdot [D_i(\nabla C_i + q_i \nabla \Phi C_i) - \mathbf{u} C_i] = F_i, \\ - \nabla \cdot (\epsilon \nabla \Phi) = (C_1 - C_2) + F_3, \\ \partial_t \mathbf{u} - \Delta \mathbf{u} + \nabla p = -(C_1 - C_2) \nabla \Phi + F_4, \\ \nabla \cdot \mathbf{u} = 0. \end{array} \right. \tag{2}$$

$$\tag{3}$$

$$\tag{4}$$

$$\tag{5}$$

Matrix

$$\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$$

$$\left[ \begin{array}{cccc|cc} 1 & 12 & 3 & 8 & 1 & 4 \\ 14 & 5 & 16 & 21 & 2 & 5 \\ 7 & 18 & 9 & 7 & 3 & 6 \\ \hline 23 & 0 & -1 & 8 & 13 & 26 \end{array} \right]$$

$$\left[ \begin{array}{c|c} \mathbf{A} & \boldsymbol{\beta} \\ \hline \boldsymbol{\alpha}^\top & 0 \end{array} \right]$$



## 5. BibTeX Style References

FeniCS [1]

Garlerkin Finite Element Methods for Parabolic Problems [2]

## References

- [1] A. Logg, K.-A. Mardal, and G. Wells, *Automated solution of differential equations by the finite element method: The FEniCS book*. Springer Science & Business Media, 2012, vol. 84.
- [2] V. Thomée, *Galerkin Finite Element Methods for Parabolic Problems (Springer Series in Computational Mathematics)*. Springer-Verlag, 1984.

## A. Codes

```

1  import matplotlib.pyplot as plt import numpy as np
2
3  plt.figure(num = 1, figsize=(8, 6)) n =
4  np.linspace(1,100,100) plt.plot(n, 1/n, 'bx')
5  plt.xlabel(r'$ n $') plt.ylabel(r'$ \frac{1}{n} $')
6
7  plt.figure(num = 2, figsize=(8, 6)) n =
8  np.linspace(1,100,100) plt.plot(n, np.sin(n)/n, 'bx')
9  plt.xlabel(r'$ n $') plt.ylabel(r'$ \frac{\sin(n)}{n} $')
10
11 plt.show()

```

**Listing 4** *Python*

```

1  figure() plot(XX,YY,'k-'),hold on plot(XX',YY', 'k-'), hold
2  on B= plot(boundary(3,:), boundary(4,:), 'b.',
3  'markersize', 25); hold on I = plot(index(:,1),
4  index(:,2), 'r.', 'markersize',25); hold off axis equal
5  set(gca,'xtick',[],'ytick',[]) xlim(X) ylim(Y)
6  set(gca,'looseInset',[0 0.01 0 0.01]) h = legend([B, I],
7  'boundary nodes', 'inside nodes',
8  'Location','bestoutside'); set(h, 'FontSize', 10)

```

**Listing 5** *Matlab*