ENACOM
DA CIÊNCIA AO PRODUTO

Document Type

Title

Subtitle

Authors:
Name SURNAME, degree
Name SURNAME
Name SURNAME
Name SURNAME

Support:

U F *M* G

2018-01-16

Updates

DD/MM/YYYY   Author Name

    i. initial version

DD/MM/YYYY   Author Name

    i. update

DD/MM/YYYY   Author Name

    i. update 1
   ii. update 2
  iii. update 3

Contents

Symbology

$\mathcal{C}$ a class

$\mathbb{R}$ a set

M a matrix

v a vector

Abbreviations

ANSI   American National Standards Institutean abbreviation

1 Template overview

1.1 Document options

- document type:

  - ``accept``
  - ``article``
  - ``book``
  - ``handout``
  - ``hh``
  - ``letter``
  - ``notes``
  - ``poster``
  - ``record``
  - ``report`` (default)
  - ``slides``
  - ``thesis``

- language:

  - ``english``
  - ``portuguese`` (default)

- font size:

  - ``10pt``
  - ``11pt`` (default)
  - ``12pt``

- color:

  - ``colorful`` (default)
  - ``grayscale``

1.2   Title items

- `\type{<the document type name>}`

- `\title{<the title>}`

- `\subtitle{<the subtitle>}`

- `\author[<position>]{<name>}{<surname>}`

- `\advisor[<position>]{<name>}{<surname>}`

- `\partner{<name>}{<figure>}`

- `\support{<name>}{<figure>}`

- `\date{<the date>}`

- `\local{<the local>}`

1.3   Document items

- `\copyrights{<the copyrights text>}`

- `\abstract{<the abstract text>}`

- `\ack{<the extra acknowledgement text>}`

- `\bib{<the bib-file name>}`

- ```
  \update{<the date>}{<the author name>}{
  \item <the update 1 brief description>
  \item <the update 2 brief description>
  ...}
  ```

- ```
  \symbols{
  $<symbol>$ & <meaning>\\
  $<symbol>$ & <meaning>\\
  ...}
  ```

- ```
  \abbreviations{
  <abbreviation> & <meaning>\\
  <abbreviation> & <meaning>\\
  ...}
  ```

1.4   Options for cleaning up document

- ''nobackpage'' for back page removal;

- ''nosummary'' for summary page removal;

- ''nocopyright'' for copyright text removal;

- ''noupdate'' for update history section removal;

- ''noindex'' for remissive index section removal;

- ''lean'' for blank pages removal;

- ''nofiglist'' for list of figures removal;

- ''notablist'' for list of tables removal.

2   LaTeX elements

2.1   Sectioning

- \chapter{<chapter name>}

- \section{<section name>}

- \subsection{<subsection name>}

- \subsubsection{<subsubsection name>}

- \paragraph{<paragraph name>}

2.2   List Structures

2.2.1   Enumeration

The LaTeX code

```
\begin{enumerate}
   \item first
   \begin{enumerate}
      \item first first
      \begin{enumerate}
         \item first first first
      \end{enumerate}
   \end{enumerate}
   \item second
\end{enumerate}
```

results in

   i. first

      a. first first

         1. first first first

  ii. second

2.2.2 Description

The LaTeX code

```
\begin{description}
    \item [item] description
    \item [item] description
\end{description}
```

results in

item description

item description

2.2.3 Itemization

The LaTeX code

```
\begin{itemize}
    \item item
    \begin{itemize}
        \item subitem
        \begin{itemize}
            \item subsubitem
        \end{itemize}
    \end{itemize}
    \item item
\end{itemize}
```

results in

- item

  - subitem

    - subsubitem

- item

2.3 Theorems and proofs

2.3.1 Definition

The LaTeX code

```
\begin{definition}[something]
   This is the definition of something.
\end{definition}
```

results in

Definition 1 (something). *This is the definition of something.*

2.3.2 Theorem

The LaTeX code

```
\begin{theorem}[someone]
  This is the statement of someone's theorem.
\end{theorem}
\begin{proof}
  This is the proof of someone's theorem.
\end{proof}
```

results in

Theorem 1 (someone). *This is the statement of someone's theorem.*

Proof. This is the proof of someone's theorem. □

2.3.3 Lemma

The LaTeX code

```
\begin{lemma}[someone]
  This is the statement of someone's lemma.
\end{lemma}
\begin{proof}
  This is the proof of someone's lemma.
\end{proof}
```

results in

Lemma 1 (someone). *This is the statement of someone's lemma.*

Proof. This is the proof of someone's lemma. □

2.3.4 Corollary

The LaTeXcode

```
\begin{corollary}[someone]
   This is the statement of someone's corollary.
\end{corollary}
```

results in

Corollary 1 (someone). *This is the statement of someone's corollary.*

2.4 Footnote

Foot notes are created with command "`footnote`" and they are reference by a superscripted number[1].

2.5 Equations

- use "`equation`" or "`align`" to place a numbered equation;

$$f(x) = x_1 + \frac{x_3^3}{3} + \frac{x_5^5}{5}; \tag{1}$$

- use command "`nonumber`" to unnumber equations;
- use command "`label`" to assign a label to an equation;

$$\text{minimize} \quad f(x) \tag{2}$$
$$\text{subject to} \quad g(x) \leq 0 \tag{3}$$
$$h(x) = 0 \tag{4}$$
$$x \in \mathbb{R}^n; \tag{5}$$

- use command "`eqref`" or "`autoref`" to refer to a numbered equation through its label:
  Example "`eqref`": (2).
  Example "`autoref`": Equation 2.

2.6 Table

- use command "`tabular`" to insert a table;
- use environment "`table`" to support caption and references;

---

[1]This is a foot note. It is always positioned on the bottom of the column and page where its reference occurs. Long foot notes may have more than one text line.

- use command "caption" to write a table caption;
- use command "label" to assign a label to a table;

activity	month	
	1	2
first after line break	x	
second: two lines due to width		x
third	x	
fourth		x

Table 1: A table.

- use command "autoref" to refer to a table through its label: Example "autoref": Table 1.

2.7 Text styles

Special text mode set commands, (Table 2).

code	result
\qm{a quoted tex}	"a quoted tex"
\code{a code text}	"a code text"
\textit{an italic text}	*an italic text*
\textbf{a bold face text}	**a bold face text**
\textbackslash	\
\%	%
\$	$
\&	&

Table 2: Special text set commands.

2.8 Math commands

2.8.1 Special math set commands

code	result
`\set{R}`	$\mathbb{R}$
`\class{G}`	$\mathcal{G}$
`\nin`	$\notin$
`\card{\set{S}}`	$|\mathbb{S}|$
`\floor{n}`	$\lfloor n \rfloor$
`\ceil{n}`	$\lceil n \rceil$

Table 3: Special math set commands.

2.8.2 Special math matrix commands

code	result
`\T{M}`	M^{T}
`\inv{M}`	M^{-1}
`\invT{M}`	$M^{-\mathrm{T}}$
`\diag(M)`	$\mathrm{diag}(M)$

Table 4: Special math matrix commands.

2.8.3 Special math function commands

code	result
`\e^\pi`	e^{π}
`\gradient f`	∇f
`\hessian f`	$\mathcal{H}f$
`\mi f(x)`	$\text{minimize} \quad f(x)$
`\ma f(x)`	$\text{maximize} \quad f(x)$
`\sto g(x) \leq 0`	$\text{subject to} \quad g(x) \leq 0$

Table 5: Special math function commands.

2.8.4 Special math vector or complex commands

code	result
`\opt{x}`	$x^\star$
`\conj{z}`	z^*
`\real(z)`	$\mathrm{real}(z)$
`\imag(z)`	$\mathrm{imag}(z)$
`\abs{z}`	$\lvert z \rvert$
`\norm{v}`	$\lVert v \rVert$
`\mean_i v_i`	$\mathrm{mean}_i\, v_i$
`\dsum_{i=1}^n v_i`	$\displaystyle\sum_{i=1}^{n} v_i$
`\dprod_{i=1}^n v_i`	$\displaystyle\prod_{i=1}^{n} v_i$

Table 6: Special math vector or complex commands.

2.9 Figure

- use command "`includegraphics`" to insert a figure;
  - no need to use file extensions;
  - supported files: PDF, EPS, PNG and JPG (search in this order);
- use environment "`figure`" to support caption and references;
  - use command "`caption`" to write a figure caption;
  - use command "`label`" to assign a label to a figure;
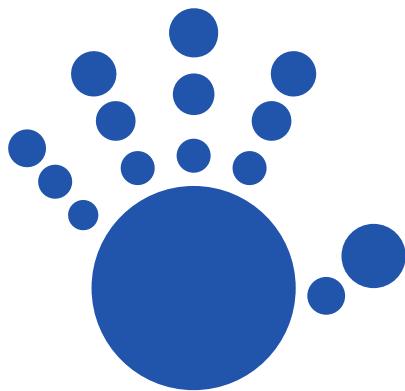
Figure 1: Figure 1

- use command "`autoref`" to refer to a figure through its label:
  Example: Figure 1.

Subfigure (a) figure 1   Subfigure (b) Figure 2
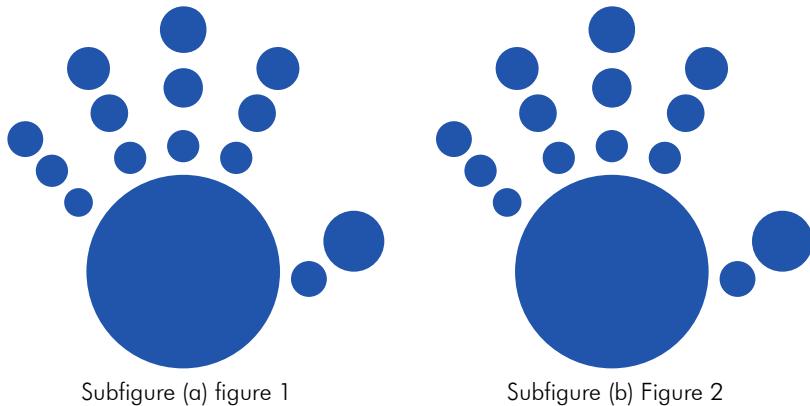
Figure 2: Figure 2

2.10 Codes

2.10.1 Python code

- use "`lstlisting`" for Python code

Writing code in LaTeX document

```
\begin{lstlisting}[language=python]
    count = 0
    while count < 5:
    print(count)
    count += 1  # comment
\end{lstlisting}
```

results in

```python
count = 0
while count < 5:
    print(count)
    count += 1   # comment
```

2.10.2 Matlab Code

- use "`mcode`" for MATLAB code listings

Writing code in LaTeX document

```
\begin{mcode}
    function y = average(x)
        if ~isvector(x)
            error('Input must be a vector')
        end
        y = sum(x)/length(x);
    end
\end{mcode}
```

results in

```
 function y = average(x)
if ~isvector(x)
   error('Input must be a vector')
end
y = sum(x)/length(x);
end
```

2.11 Algorithm

- environments:

  - use "`algorithm`" to encapsulate input, output and code;

  - use "`algorithmic`" to encapsulate code.

- commands:

  - use "`State`" to start a new algorithm line;

  - use "`Comment`" to place a line comment;

  - use "`gets`" for attributions.

- keywords:

  - "`For`", "`EndFor`";

  - "`If`", "`Else`", "`EndIf`";

  - "`Return`", "`Break`"; "`Continue`".

The LaTeXcode

```
\begin{algorithm}
  \caption{Evaluation of sinus of a sum.}
  \label{alg.Sinus}
  \algorithminput{$a$ & first part \\ $b$ & second part\\}
  \algorithmoutput{$s$ & sum of the two parts \\ $t$ & sinus of the sum\\}
    \begin{algorithmic}[1]
    \State $s \gets a + b$ \Comment{sum of input arguments}
    \State $t \gets 0$
    \For{$i = 1, 2...$}
      \State $t \gets t + (-1)^{i+1}\frac{s^{2i-1}}{(2i-1)!}$ \Comment{Taylor series for
          sinus}
    \EndFor
    \State \Return $s$ and $t$
    \end{algorithmic}
\end{algorithm}
```

results in

Algorithm 1 Evaluation of sinus of a sum.

Input
  a first part
  b second part

Output
  s sum of the two parts
  t sinus of the sum
  1: $s \leftarrow a + b$ $\triangleright$ sum of input arguments
  2: $t \leftarrow 0$
  3: **for** $i = 1, 2...$ **do**
  4:     $t \leftarrow t + (-1)^{i+1} \frac{s^{2i-1}}{(2i-1)!}$ $\triangleright$ Taylor series for sinus
  5: **end for**
  6: **return** s and t

2.12 Page orientation

This is a page in landscape. The code for this is:

```
\begin{landscape}
    \subsubsection{Page orientation}
    This is a page in landscape. The code for this is:
\end{landscape}
```

2.13 Bibliography

- use command ''`bib`'' in preamble to specify bib-file;

- use command ''`cite`'' to cite a reference as their authors;
  Surname and Surname, 2017a.
  Surname and Surname, 2017b.

- use command ''`citep`'' to cite a reference as a bracket;
  [Surname and Surname, 2017a].
  [Surname and Surname, 2017b].

- separate adjacent citations by commas;
  [Surname and Surname, 2017a,b].

References

Surname, N. and Surname, N. (2017a). An article title. *The Journal*, pages 0--10.

Surname, N. and Surname, N. (2017b). *A book title*. The Publisher.