

TeXstudio - editor suitable for beginners in LaTeX

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Abstract — This article in short introduces TeXstudio editor, which ease creation of scientific and mathematical documents in program LaTeX. This editor is due to its simplicity and helpful community, suitable mainly for beginners, who do not have any or very low experience with LaTeX.

Keywords — TeX, LaTeX, typographical tool, TeXstudio

I. INTRODUCTION

TeX (*'tex/* or *'tek/*) is computer program, which author is Donald E. Knuth, and which is suitable for producing scientific and mathematical documents of high typographical quality [1]. In contrast to classical WYSIWYG (What you see is what you get) editors like MS Word, TeX is. WYWIWYG editor (What you want is what you get). Thus author is not able to see final output while typing text in to the computer. Output is visible after processing file with TeX.

LaTeX is built on TeX, but is more simplified then classical TeX, to be more user friendly. LaTeX is set of prearranged macros, that ease work with TeX [2].

In present LaTeX become more popular because of elaborated editors. These editors ease and in most of cases speed up work by predefined commands, tables, etc. Most popular editors are for example TeXstudio, TeXmaker or TeXworks. Then there are also online editors like ShareLaTeX or Overleaf. These provide creation of LaTeX documents directly in web browser. Output then can be easily downloaded to PC or uploaded to some of the clouds.

This article provides very brief introduction to creating and editing of documents in TeXstudio editor, which works on platform MS Windows. The goal of this paper is not to explain work with LaTeX in detail, but ease LaTeX mainly to users of WYSIWG editors, by user friend interface of TeXstudio.

II. INSTALLATION AND FIRST SETUP

Before the installation of editor is firstly important to install one of the distributions of TeX. Most popular distribution for MS Windows is **MiKTeX** which is able to download at webpage [3]. In case of multiplatform distributions is probably most popular TeXLive. It is available on project web site [4]. Installation itself is quite simple and it does not differ from installation of other common software. Thus we will not have to dedicate it more deeply.

After installation of distribution we can approach to installation of TeXstudio editor. Installation package is available at page. After installation is possible to start with creation of LaTeX documents.

By clicking at TeXstudio icon the main window will appear (see Fig. 1), where in upper part is located classical main panel with options *File*, *Edit*, *Tools*, etc. On the left hand side of the window it can be seen document structure. Document can consists of more parts, between which can be switch here. Next in this left panel can be found bookmarks, but also there are located prearranged commands

for symbols (Greek, Cyrillic, math, etc.), mathematical operators, brackets, etc.

In the middle part of the window is opened currently edited document. For illustration in Fig. 1. has been chosen presentation from built in template. On the right hand side is pdf view to edited presentation.

The last part is message area located in the bottom of the program window. Message area offers information about status of the compilation. It informs user if the compilation run correctly or if there is some mistake. If there was a mistake, it will show incorrect row and type of error.

After the first startup is good to check, if the program found installed distribution of TeX. This will prevent from later problems with compilation. It can be checked in Main menu under the **Options>Configure TeXstudio**. It will appear the configuration window where can be found option **Commands**. Here is needed to be checked if under the option LaTeX and PdfLaTeX are inserted correct paths. In case there are values set as *<unknown>*, it is needed to set paths according to manual available in **Help>User Manual** or at official webpage [5], [6]. This problem often occurs when the editor is installed before the TeX distribution. This is reason why paths are not set because program was not able to find it during installation.

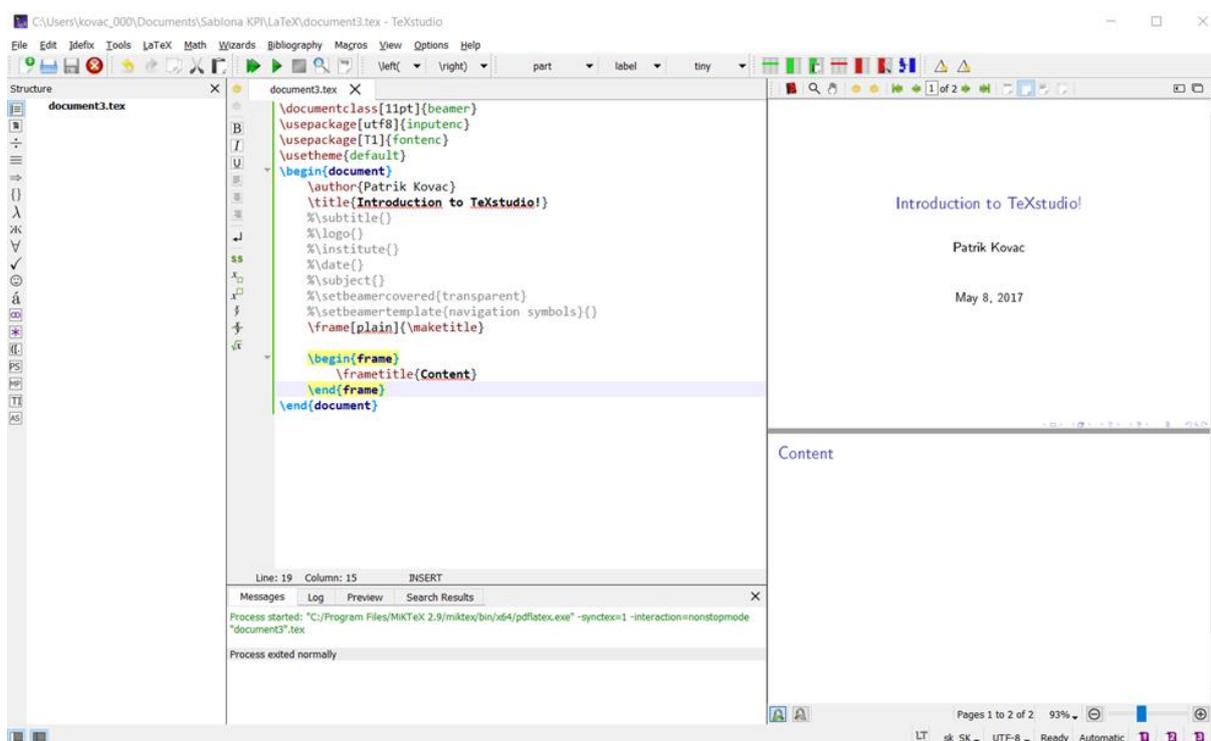


Fig. 1 Main window of TeXstudio

III. DOCUMENTS CREATION AND OPENING

TeXstudio offers couple of option how to create a new document. The first is classic option of creating blank document through option **File>New**. This option is more suitable for advanced users, who already know individual commands and used packages. The next option for creating new documents is use prepared templates. This option can be found in **File>New from Template**. In this case have user at choice from list of templates for articles, curriculum vitae, books, etc. In these templates is created structure of documents but in preamble are not defined any packages (like language, encoding) or another details. The most suitable option for newbies in LaTeX is creation of new document through the option **Quick Start**. It is located in main panel under the option **Wizards**. This option is illustrated in the Fig. 2. After the selection of required type of document, in the editor part of window is created code which represent selected properties of documents. In case from Fig. 1. has been created Beamer presentation also from **Wizard** option. In the upper part of the code is defined type of document **beamer** through the command `\documentclass`. In the preamble are also used packages by command `\usepackage`. Packages extend functionality of LaTeX about the

large number of different commands. As was said these packages customize text encoding, used language, etc. The complete list of packages can be found at webpage [7]. After adding new package to preamble, package is automatically downloaded from repositories at the internet.

Except the creation of new documents is very often needed to open existing documents or templates from other sources. Existing document is opened by clicking on icon *Open* (📁), or classical way through **File>Open**. User then set the path to desired document, that will be automatically loaded in to the editor. In case that is needed to save actual document as template for later use, is process trivial. User just need to apply option **File>Make Template** at the currently opened document.

Compilation of the document is provided by clicking on the icon *Compile* (▶), in the upper part of the code editing area. Before the compilation document has to be saved (💾). Preview of the document is provided by clicking at button *View* (🔍). Button *Build & View* (▶🔍) does everything on one go.

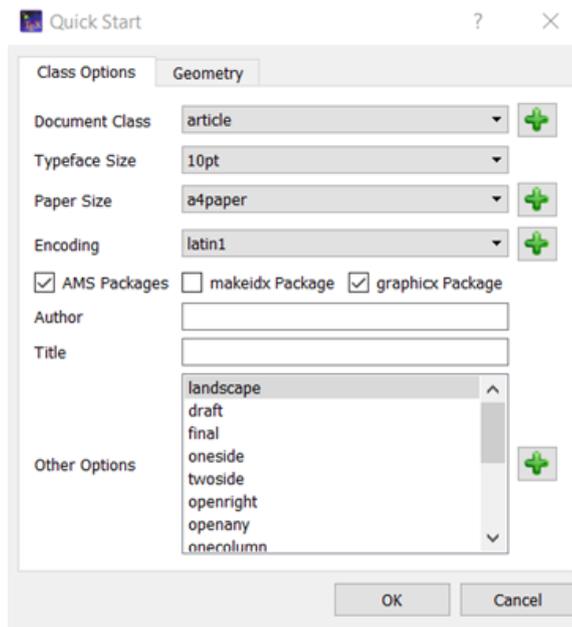


Fig. 2 The Quick Start wizard for creation of new documents

IV. BASIC COMMANDS AND TEXT FORMATTING

All commands in LaTeX are in the following form [2] :

`\(name of command)`

where (name of command) is a string of letters or in some commands only single character. Be careful LaTeX is case-sensitive.

Very important in this state is mention the environments. These are bordered by commands:

`\begin{(name of enviroment)}`

`\end{(name of enviroment)}`

The code inserted between these two commands is processed in a way, that is specific for a given environment. From the Fig. 1 is possible to see, that it was used the environment *document* and *frame* between them was inserted other commands.

Basic logical division of the text in to the chapters, sections and subsections is provided by series of the following commands:

`\chapter{(name of chapter)}`

```
\section{(name of section)}
```

```
\subsection{(name of subsection)}
```

This sectioning and all the environments is possible to find in TeXstudio under do option **LaTeX>Sectioning** or **LaTeX>Enviroments** in the main menu. Here are also located commands for edition of size and styles of fonts (**LaTeX>Font Sizes/Styles**). Basic commands for the font style are located in the tool panel on the left hand side of the window with code as well. For example command for bold text with icon *Boldface* (**B**), or cursive font *Italics* (**I**).

V. LABELS AND REFERENCES

Making of cross-references is very convenient for better orientation in created text. Cross-references are created by labels on which we are able to reference later. Label is created by the command `\label` and reference by the command `\ref`.

Labels are always „sticked“ after some section, equation or figure on which we will later make a reference. Fast insertion of label in TeXstudio can be done by clicking on the button *label*, located directly in the toolbox above the area with the code. Useful keyboard shortcut for creation of the fast reference to next label is **Ctrl+Alt+R**.

VI. IMAGE INSERTION

In the beginning was mentioned option Wizards by which is possible to create quick body of the document. Except this feature there are located others, one of them is quick image insertion. Fig. 3 shows possibility of image insertion which can be found in **Wizards>Insert Graphics**.

In the upper part of the window from the Fig. 3 can be seen option of the path selection to the image, which is desired to be in the document. Further there are located graphic options, like setting width and height of the image. In the next area can be set caption of the figure and where the caption will be located (above or below the figure). Short caption is the one, which will be shown in the list of figures of the document. Long caption will be located above or below the graphic depending on the settings. After all the last option is name of the label. Name of the label used to be filled in automatically with the name of the inserted image. After clicking on OK button is generated code needed for LaTeX.

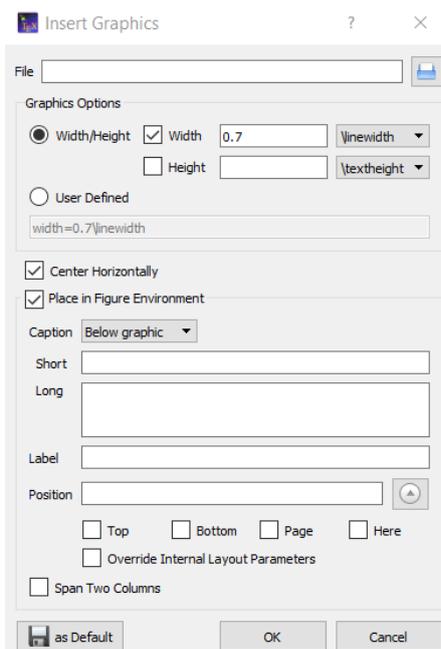


Fig. 3 Insert graphic wizard in TeXstudio

VII. EQUATIONS AND TABLES

Before the explanation of how are the equations inserted in the TeXstudio, is very convenient to mention set of tools *AMS-LaTeX*. This set of tools contain several number of packages, which are used for production of advanced typographical tasks [2]. Basic packages from this set are *amsmath*, *amssymb* a *amssymb*. These package is good to load in the preamble of the document, which will contain the mathematics.

Short mathematical expressions, which have to be written in one paragraph, are inserted between two symbols \$. Symbols \$ represent beginning and end of the inline mathematical mode. In TeXstudio is possible to highlight some mathematical text and by clicking on the icon *Inline math mode* ($\$$), the following text will be inserted between two \$ symbols. Similarly have to be bordered commands for upper and lower index, in case that is needed to have them in one paragraph. Command for upper index is generated press down the button *Subscript* (x_{\square}), lower index *Superscript* (x^{\square}).

In case that is needed to write down some advanced mathematical expressions is more convenient to use multiple line mathematical mode, concretely environment called *equation**. Generation of the command for creation of environment is can be found in main menu, under the option **Math>Math equations>env equation***. In **Math** menu is located huge number of mathematical operations, functions, symbols and operators that are commonly used in environment *equation**.

Interesting feature is **Math Assistant** again located in **Wizards** option (Fig. 4). It is able to generate LaTeX code from written down equation to this assistant. In example from Fig. 4 it was written down gravitational force formula (yellow area). In the area above has been recognized correct formula from written text.

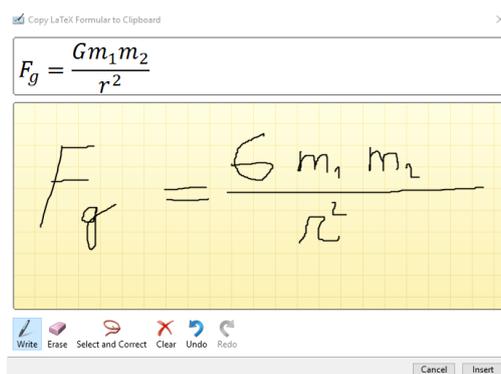


Fig. 4. Math Assistant Wizard

From this assistant, after clicking on the button insert, have been generated following command:

```
 $\{F\}_{g}=\frac{G\{m\}_{1}\{m\}_{2}}{\{r\}^{2}}$ 
```

This command really belongs to the written equation and is completely correct for compilation in LaTeX. This feature is not used very often, because writing equations with computer mouse is quite uncomfortable. But maybe this feature will more appreciate users with touchscreen monitors and stylus pen.

The last demonstration from the TeXstudio editor will be possibility of tables creation. Table creation is in LaTeX quite „great science“. For this reason, we will show how we can ease the process by using the mentioned editor. Again will be used option **Wizard**, where will be created table like in classical WYSIWYG editore. From this table will be generated code needed for compilation in LaTeX. The window shown in the Fig. 5 has been obtained from **Wizards>Quick Tabular**.

From the Fig. 4 can be seen, that user will firstly define number of rows and number of columns. For each row is possible to set align of the content. Also is possible to merge desired columns or set the line which bounding the table, etc.

Although the *Quick Tabular* does not provide creation of very advanced tables, it is convenient assistant when is needed to quickly create simple table. Similarly, it can help newbies in LaTeX, for understanding of basic commands for creation tables.

After pressing button *OK* it is generated LaTeX code. For table from Fig. 5 was the code following:

```
\begin{tabular}{||l|c|r||}
\hline
Col. 1 & Col. 2 & Col. 3 \\
\hline
542 & 353 & 683 \\
\hline
783 & 12 & 77 \\
\hline
\end{tabular}
```

In present also exists online LaTeX tables generators. One of them is available at following webpage [8].

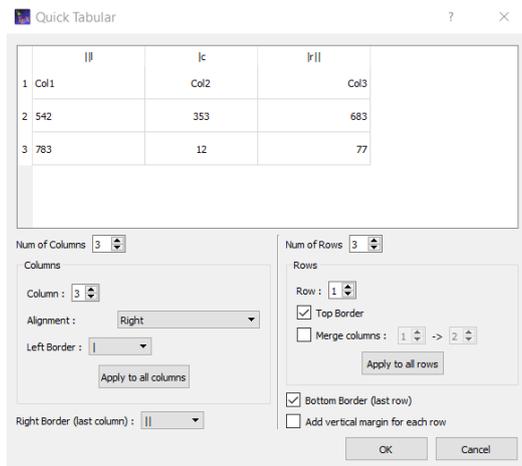


Fig. 5. Quick Tabular wizard in TeXstudio

VIII. CONCLUSION

This article in short shows fundamentals of work with TeXstudio editor. It is popular because of its well-arranged graphical interface, which ease transition to users of WYSIWYG editors to LaTeX. In case of some uncertainties about LaTeX, it is very suggested to read through literature [1], which is quite straightforward and freely available. For this reason, it was translated to several languages.

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