LaTeX: The Language of Scientific Writing

TEQIP-III Sponsored FDP

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Outline of FDP

- Motivation
- Installation of LaTeX software on Windows
- Report Writing
  - LaTeX commands
  - JabRef and its utility
- Thesis Writing
- Paper Writing: IEEE, Elseviers, Springer
- Presentation using LaTeX
- Resume/Letter/synopsis

Problems in writing Thesis/Paper

- Formatting (Single Column, Two Column)
- Reference Management
- Figure Management
- Table Management
- List of Figures
- List of Tables
- ....Many more

Solution is Latex

Introduction

- Pronounced: "Lay-tech".
- Latex —- universal typesetting tools for academic research community. Math, Physics, Engineering, Finance ...
- Supported by nearly all the publishing corporations:
  IEEE, ACM, Elsevier, Springer, Wiley, etc.
- Almost all the IEEE Journals are published as a classic Latex Style
- TeX: computer program released in 1982 by Donald E. Knuth:
  A revolution in typesetting
- Later, a mathematician and computer scientist, Leslie Lamport, wrote a variant of TEX called LaTeX that focuses on document structure:
  Packages to make TeX easier to use
- Low level markup language and case sensitive

Softwares for programming or writing the .tex codes

- Windows:
  MikTeX, TeXmaker, WinEdt, LyX and so on
- Linux like ubuntu:
  TeX-Live, Kile, LyX, and so on
- Mac OS:
  MacTeX, LyX

TeX vs. LaTeX

- TeX can recognize only .ps files for images
- LaTeX can recognize .jpg files for images
- BibTeX is used for Bibliography i.e. giving references
- Recently some ways have been discovered to overcome this limitation.

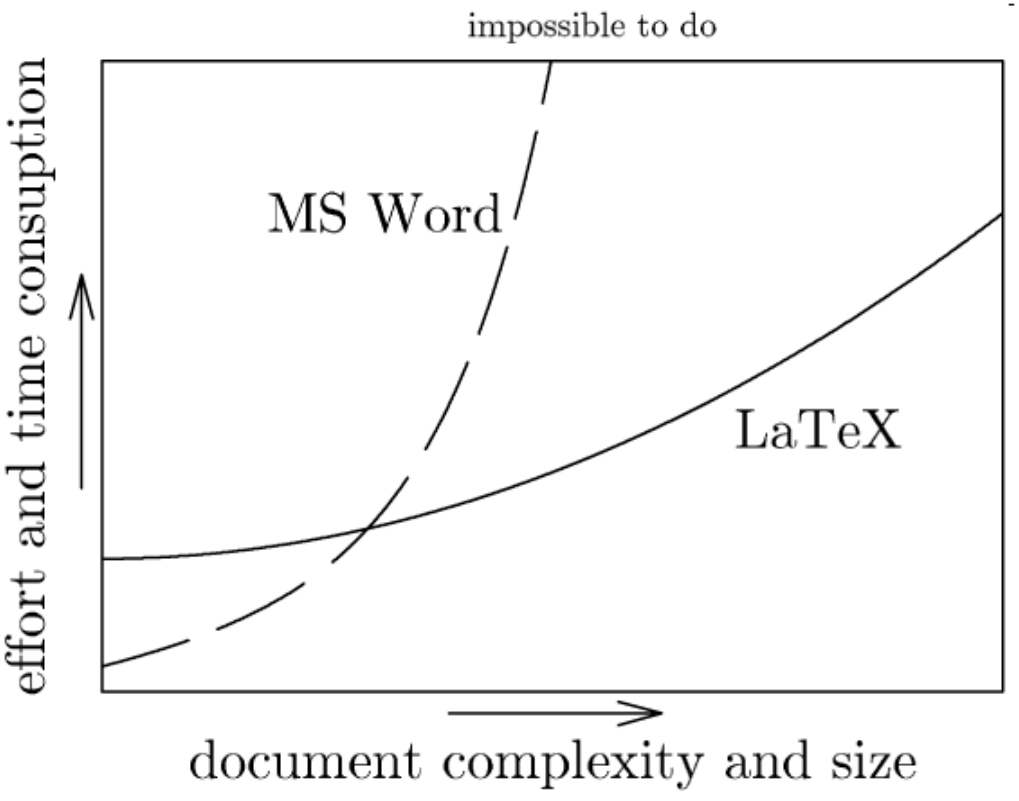
Advantages of Latex

- It is efficient for using on publication of books or articles.
- It can save user's time by automatically formatting the sections, equations, and pictures of the documents.
- Users need only to learn a few simple commands, which specify the logical structure of a document.
- Complex structures such as footnotes, references, table of contents, and bibliographies can be generated easily.
- LaTeX is highly portable and free

Advantages of Latex

- High typeset quality
- Easy to include math formulas
- Source file format is not bounded to a particular OS or platform
- Latex implementations exists for all platforms (DOS, Windows, Linux,..)
- Good for large documents

Advantages of Latex



Disadvantages of Latex

- Maybe hard to use at the beginning.
- Don't support WYSIWYG ("what you see is what you get"): except lyx or next version Tex

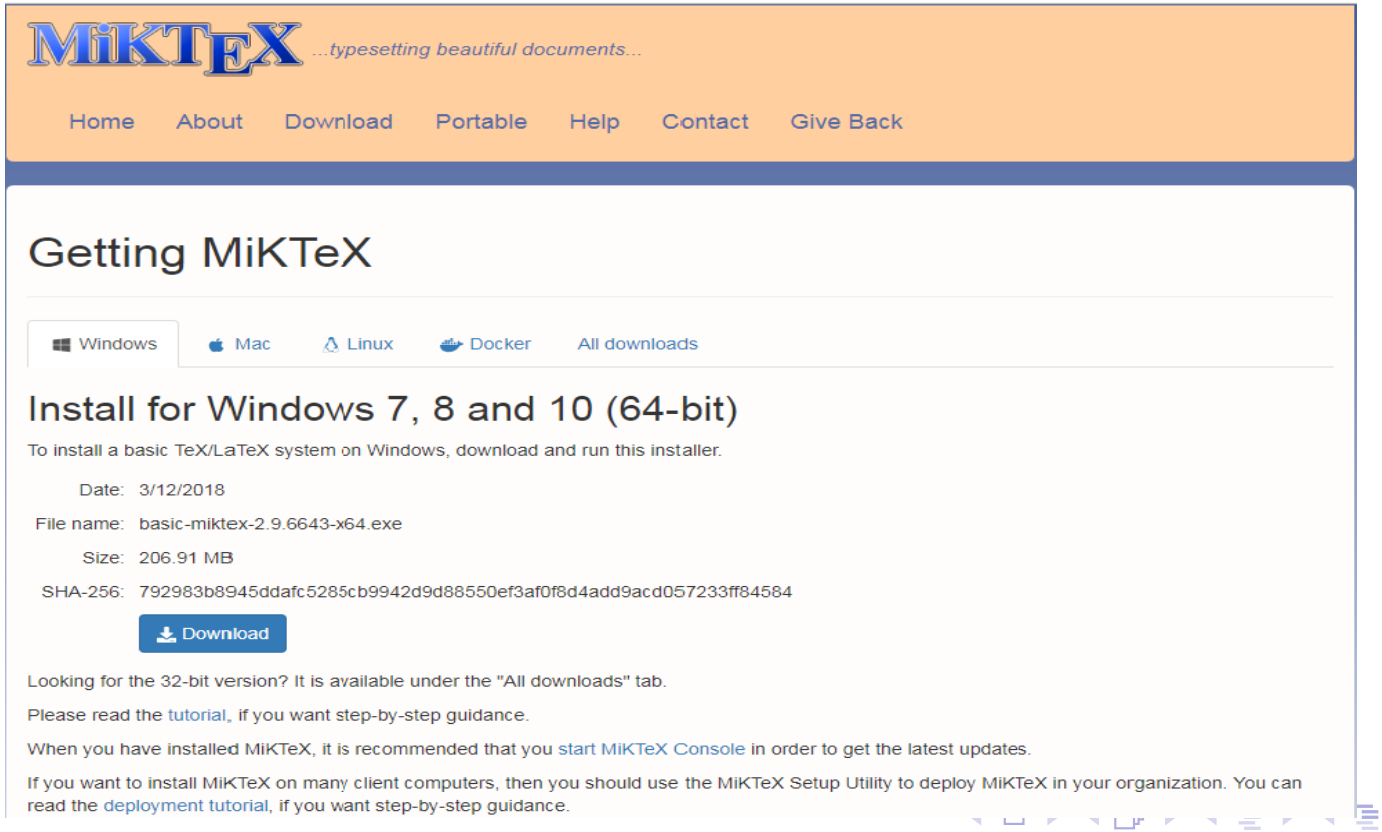
How LaTeX Works

- LaTeX source editor + LaTeX compiler (*.tex).
- Like C + Borland C compiler
- Many LaTeX compilers.
- Popular LaTeX IDE for Windows: WinEdit + MiKTeX
  http://www.miktex.org/ + http://www.winedt.com/
- Popular LaTeX IDE for Linux: Kile + eTeX or encTeX or MiKTeX
  http://kile.sourceforge.net/

For Any Problem $\Longrightarrow$ Google

MikTex on Windows

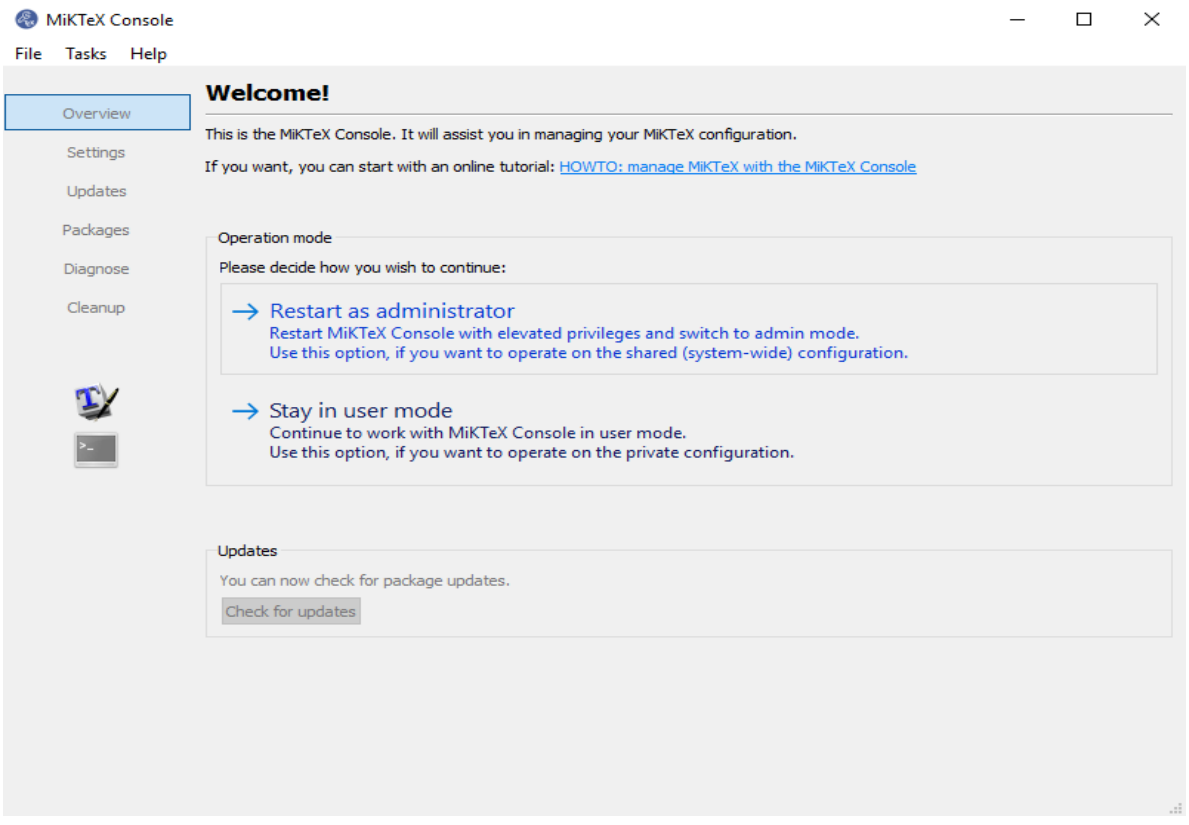
- Download the MikTex Software.
- Go to link: https://miktex.org/download



MikTex on Windows

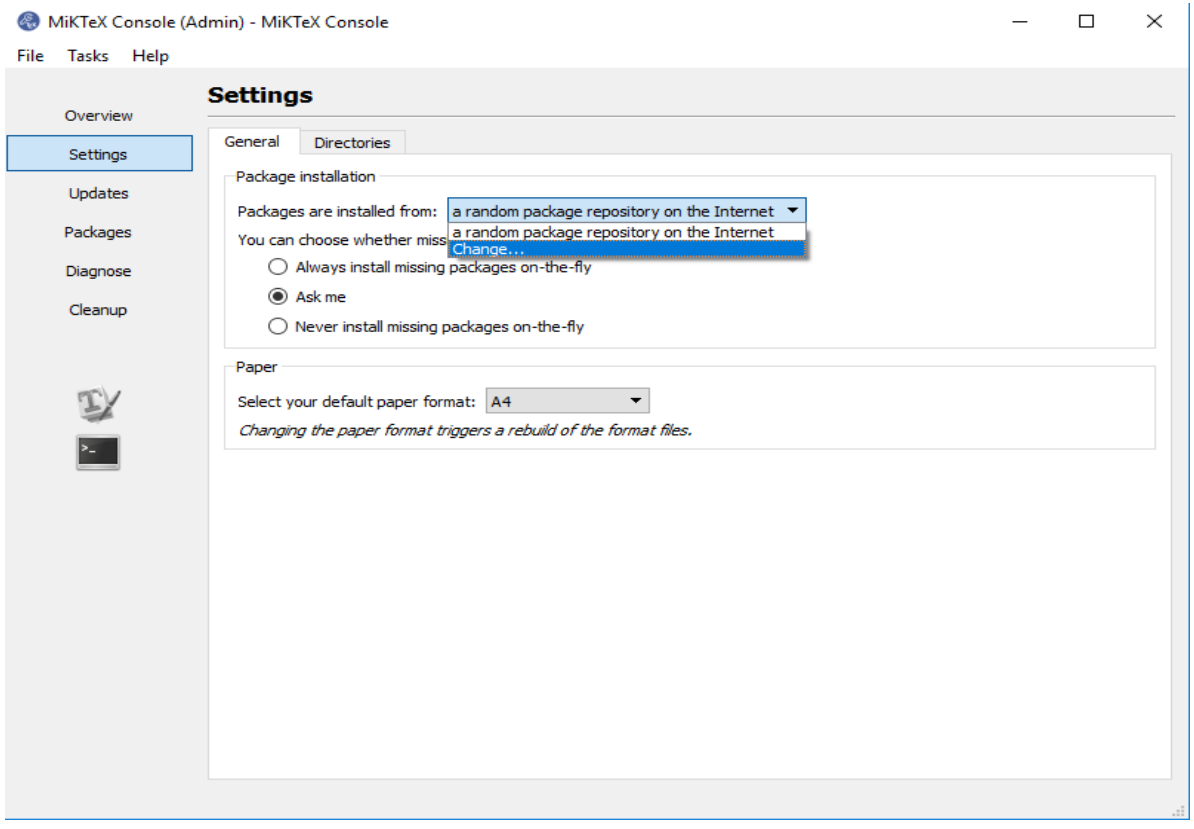
- Step 2: Install the software as per the guided steps.

MikTex on Windows



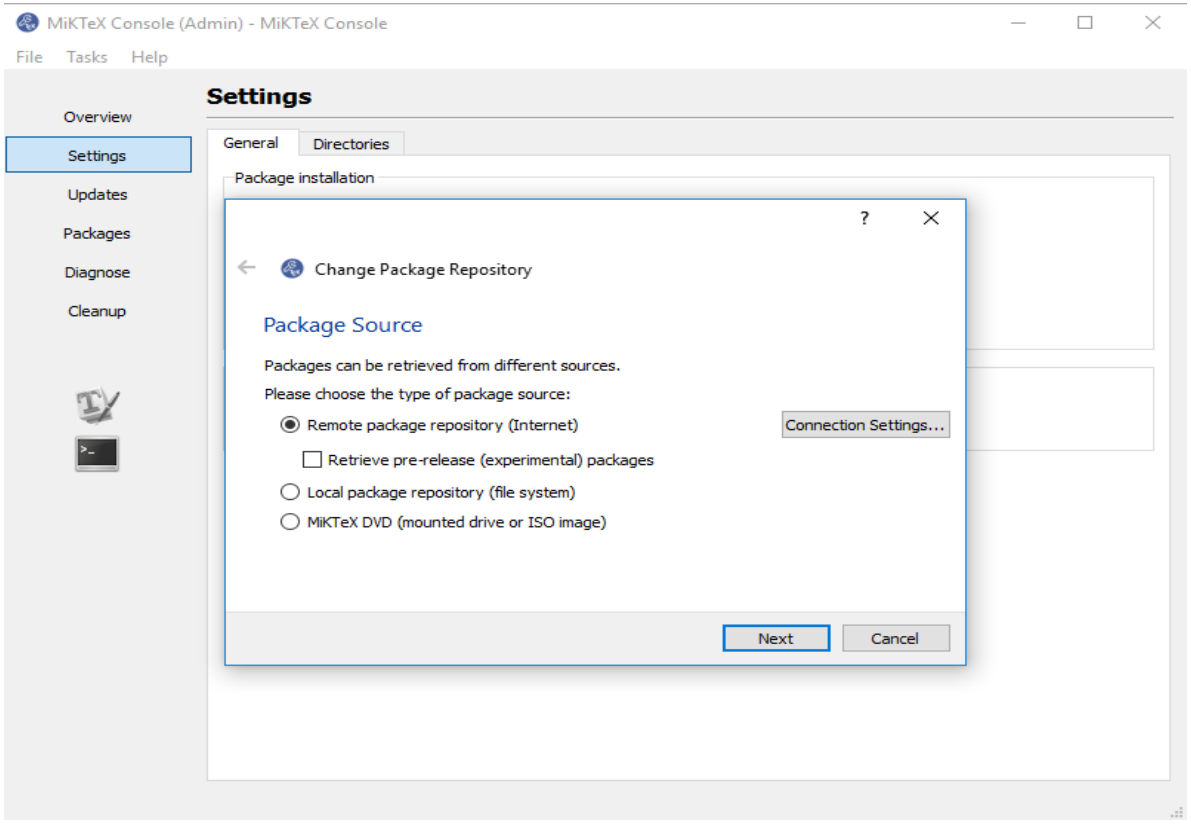
(b) Step 3: Open the MikTex Console and Select the operation mode.

MikTex on Windows



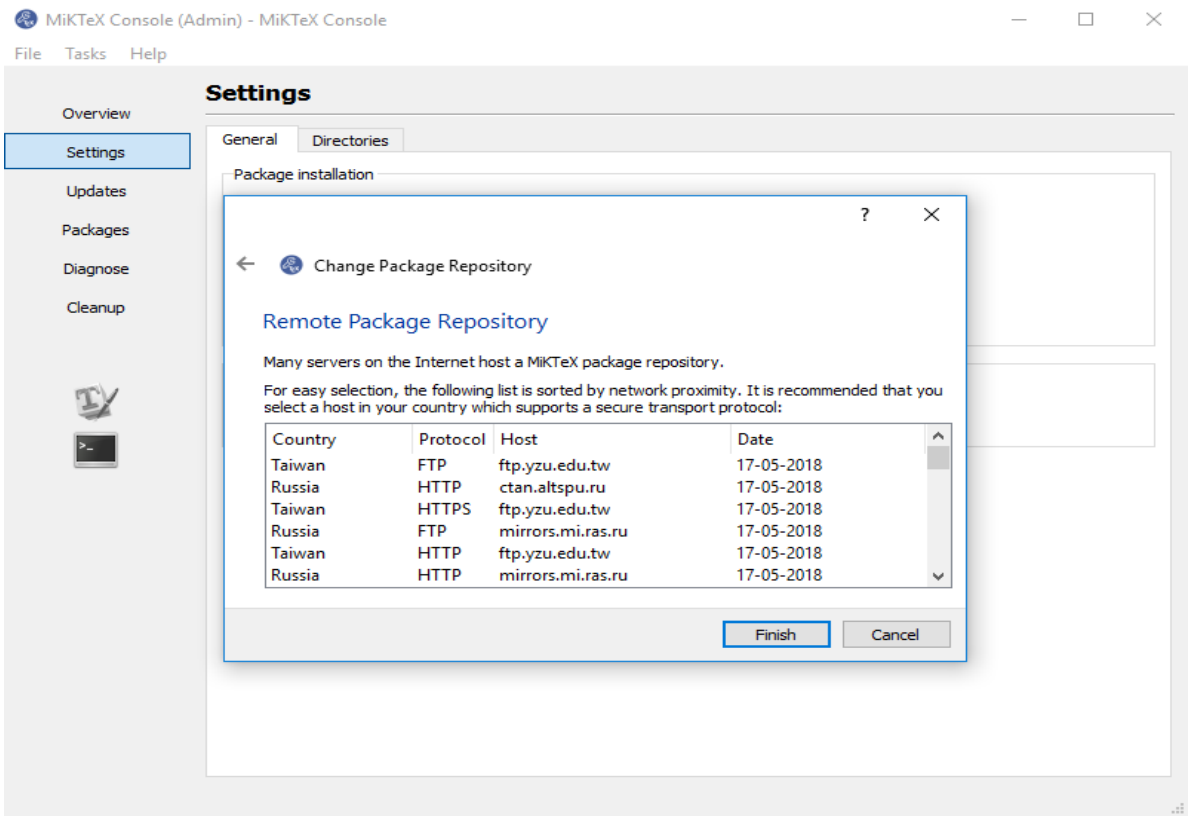
(c) Step 4: Change the package repository.

MikTex on Windows



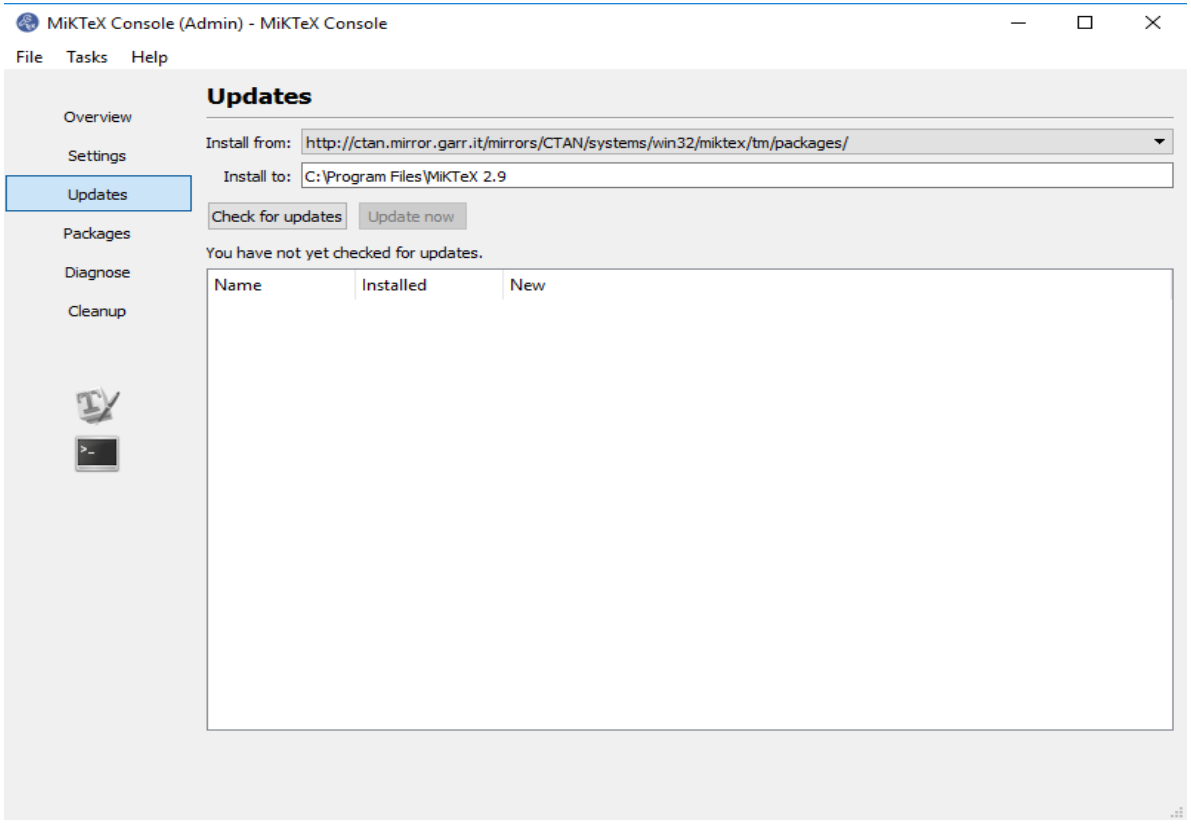
(d) Step 5: Check the Connection Settings.

MikTex on Windows



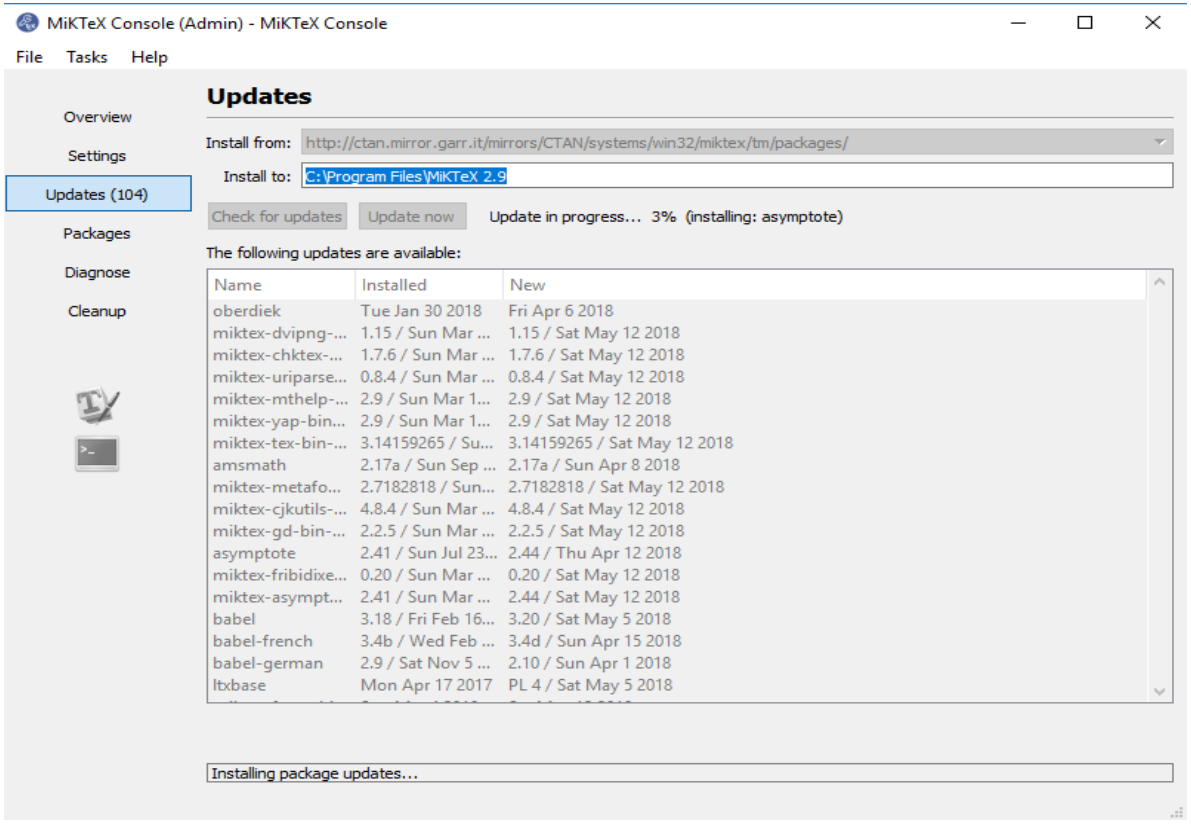
(e) Step 6: Select the repository.

MikTex on Windows



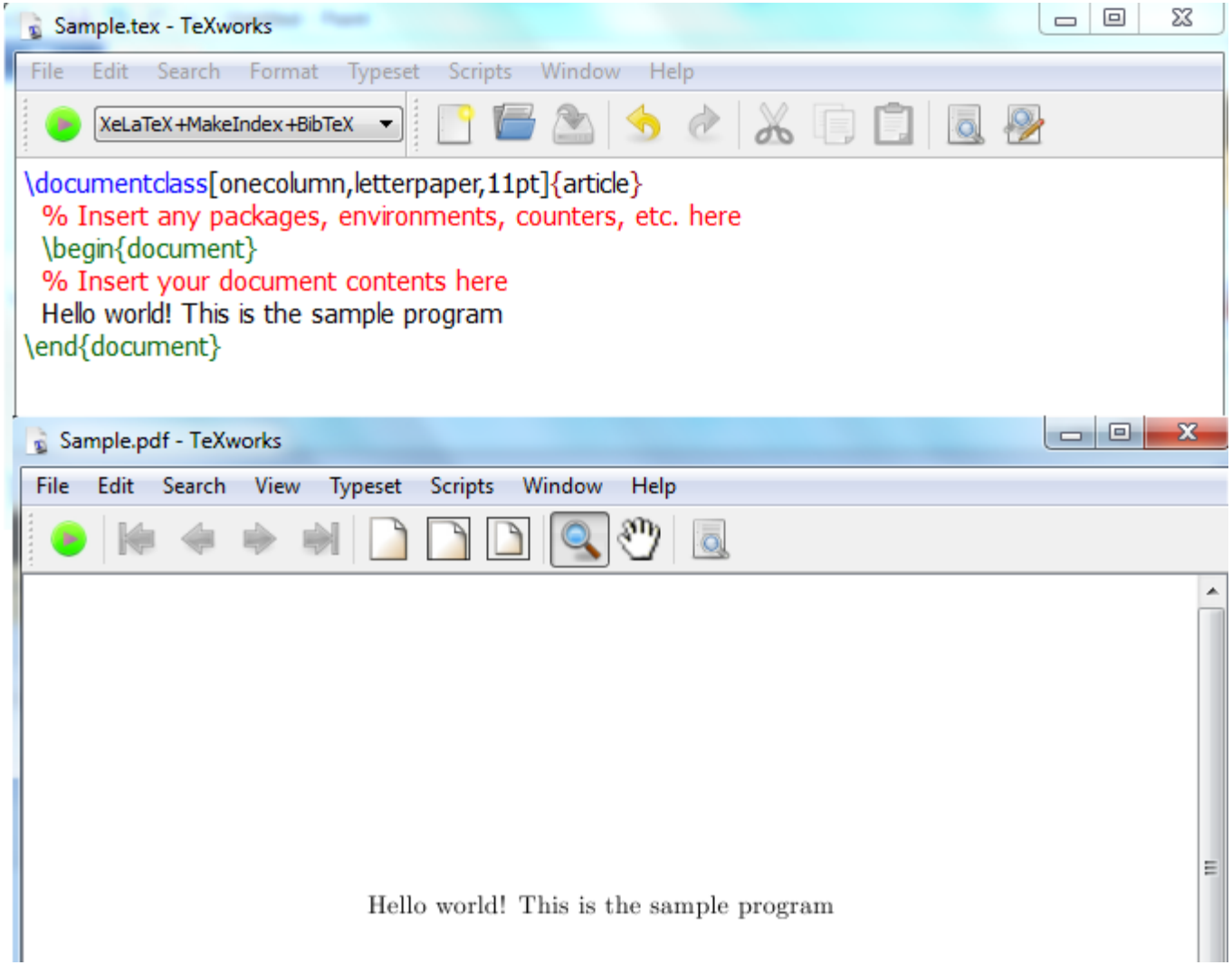
(f) Step 7: Check package updation.

MikTex on Windows



(g) Step 8: If any, perform package updation.

How LaTeX Works



Required Components of a LaTeX Document

- Every LaTeX document must contain the following three components. Everything else is optional (even text).

1. \documentclass{article}
   - Tells LaTeX what kind of document it is to process:article, report, book, etc.
   - The default font size for each class is 10 point.
   - \documentclass[11pt]{article} or \documentclass[12pt]{article}
   - Required information is included in LaTeX commands in braces {}.
   - Optional information is included in square brackets []
2. \begin{document}
3. \end{document}

Learn by examples

Example 1. Basic

```
\documentclass{article}
\begin{document}
This is my \emph{first} document prepared in \LaTeX.
\end{document}
```

Note: Select pdfLateX+MakeIndex+BibTeX from the top menu bar and hit F5 or run icon or ctrl+T

Learn by examples

Typesetting Text

- \\ or \newline and \newpage
- For quotes, use `` (two backquotes) and '' (two apostrophes) instead of ". For single quotes, just use ` and '.
- Bold **\textbf{...}** or **{\bf ...}**
- Italics **\emph{...}** or **\textit{...}** or **{\it ...}**
- Underline **\underline{...}**
- Color **\textcolor{name of color}{...}** or **{\color{name of color}...}** . You have to use <xcolor> package.
- The predefined color names are:
  black, blue, brown, cyan, darkgray, gray, green, lightgray, lime, magenta, olive, orange, pink, purple, red, teal, violet, white, yellow
- New colors are defined as {in preamble}:
  \definecolor{name}{RGB}{10,20,30}

Learn by examples

Exercise 2. Play with text

- Write a LaTeX code for the content given in **Ex2_1.pdf**
- Write a LaTeX code for the content given in **Ex2_2.pdf**

Learn by examples

- Consecutive whitespace characters (blank or tab) are treated as one space.
- Paragraphs must be separated by at least one line in the .tex file.
- Comments can be added using the % character. Any text on a line after % will be ignored by the TEXcompiler.
- Special Characters:
  - The following symbols are reserved:
    # $ % & _ { } ^ ~ \
  - To include them in your text:
    \# \$ \% \& _ \{ \} \^{} \~{}
  - Note: you cannot just do \\ (which is a linebreak) , but instead:
    $\backslash$

Learn by examples

Example 3. Type code to produce the following sentence in your document

Item #1A\642 costs $8 & is sold at a ~10% profit.

Learn by examples

- **Spaces:** \ \ or \newline ...
- **Quotes:** \lq\lq double quotes \rq\rq and \lq single quotes\rq
- **Dashes:** 2-5 : - ; 2–5 : - -; 2—5 : - - -
- **Accents:**

ò \‘o	ó \’o	ô \^o	õ \~o
ō \=o	ȯ \.o	ö \"o	ç \c c
ǒ \u o	ǒ \v o	ő \H o	ọ \d o
o̲ \b o	o͡o \t oo		

- **Type size:**

size	{\tiny size}	size	{\large size}
size	{\scriptsize size}	size	{\Large size}
size	{\footnotesize size}	size	{\LARGE size}
size	{\small size}	size	{\huge size}
size	{\normalsize size}	size	{\Huge size}

Learn by examples

- **Type style:**

	STYLE	COMMAND
FAMILY	roman	\textrm{roman}
	sans serif	\textsf{sans serif}
	typewriter	\texttt{typewriter}
SERIES	medium	\textmd{medium}
	boldface	\textbf{boldface}
SHAPE	upright	\textup{upright}
	italic	\textit{italic}
	slanted	\textsl{slanted}
	SMALL CAP	\textsc{small cap}

- **Double Spacing:**put \renewcommand{\baselinestretch}{2} between the \documentclass command and the \begin{document} command.
- \newpage will force the start of a new page.

Paragraph Alignment

- Left justified: **begin{flushleft}** ...**end{flushleft}** or **raggedright**
- Right justified: **begin{flushright}** ...**end{flushright}** or **raggedleft**
- Center: **begin{center}** ...**end{center}** or **centering**
- Page break: **pagebreak**
- New page: **newpage**

Learn by examples

Exercise 4. Spacing

- Make a LaTeX document given in **Ex4_1.pdf**
- Make a LaTeX document given in **Ex4_2.pdf**

Command Types

Only **3** types of commands:

{\command} OR {\command{}}

OR

\begin{command}
{Everything you want to do using that command comes here}
\end{command}

Few supports available in the software

- Tab Key or long wait for auto completion of the commands
- Make sure that your spell check is ON.
- Make sure line numbers are enabled.
- Syntax coloring is enabled for LateX

Report Writing
Chapters, Sections and Cross-References

- To create new chapter, use command:
  \chapter{chapter name}
- There are two related commands for creating sections:
  - \section{sectiontitle}: It numbers the sections.
  - \section*{sectiontitle}:, It does not numbers the sections.
- **subsection:** \subsection{subsectiontitle}
- **subsubsection:** \subsubsection{subsubsectiontitle}
- **Cross-References:**use \label{name} to label the point in your document.
- Use \ref{name} to refer to that point.

Sample Report writing

Exercise 5. Chapters, Section and cross referencing

- Make a LaTeX file which produces the output shown in the pdf file **Ex5.pdf**

Page Numbering and Headings

- The command \pagestyle controls page numbering and headings.
- It should always go between the \documentclass{article} and the \begin{document}.
  - \pagestyle{plain} is the default, which puts the page number at the center of the bottom of the page and provides no headings.
  - \pagestyle{empty} provides neither page numbers nor headings.
  - \pagestyle{headings} will provide page numbers and headings from any \section's that you are using.
  - \pagestyle{myheadings} will provide page numbers and custom headings.
    - \markright{right head} (used for book, report and article class)
    - \markboth{left head}{right head} (only in the book class)

Creating a Title Page

- \title{your title here}
- \author{your name here}
- \date{\today}

  commands must be between the \documentclass command and the \begin{document} command
- \documentclass[titlepage]{article} may be used as options
- use **maketitle** just after **begin{document}**

All indexes in report

- To insert table of contents use command \tableofcontents{}
- To insert list of tables use command \listoftables{}
- To insert list of figures use command \listoffigures{}
- To insert appendix use command \appendix{}
- Appendix needs chapter(s) defined.

Table of Contents and Abstracts

- **Table of Contents:**
  - Use \tableofcontents after your \begin{document} command to provide a Table of Contents.
    (Use if you have been using \section commands throughout your document)
  - It may be necessary to run LaTeXtwice on a document with a Table of Contents.
  - The First time, LaTeXstores the page numbers for the sections in a separate File,
  - Then the second time LaTeXwrites this information into the Table of Contents.
- **Abstracts:**
  - To create an abstract, place your text in an abstract environment, i.e., between \begin{abstract} and \end{abstract} commands
  - The abstract should come immediately after your \maketitle command, but before any \tableofcontents command.

Sample Report writing

Exercise 6. Title, content, and abstract

- Edit the solution of Exercise 5 as follows
  - Add title page to the report as name of your institute
  - Add author name to the report as your name
  - Add page break so that title page is separated.
  - Add table of contents
  - Add abstract to the report.

Refer **Ex6.pdf**

About package manager and packages

- Packages are required for additional functionalities . (total 2600+ are available.)
- Open package manger and check which all are installed.
- packages may be added according to the need.
- Command: \usepackage{package_name} just before \begin{document} line.

Text Tweaks

- To get a^{text1}, use command: a^{text1}
- To get a_{text1}, use command: a\textsubscript{text1}

  Note: you need to used following package. \usepackage{fixltx2e}
- \hspace{10 pt} or \vspace{1 in} is used for giving horizontal or vertical spaces of 10 points and 1 inch respectively. Units can be cm, mm, pt, in etc.

Text Tweaks contd...

- For colored text, you need to use \usepackage{color}
- Command: \textcolor{colored text} E.g. This the example of colored text
- Pre-defined colors: white, black, red, green, blue, cyan, magneta, yellow etc. User defined colors can also be used.
  e.g. \textcolor[rgb]{0.98,0.00,0.00}
- To have tiny font, type command \tiny <text>
  E.g. This is tiny text
  E.g. This is huge text \huge
- Other similar commands are:
  tiny, scriptsize, footnotesize, small, normalsize, large, Large, LARGE, huge, Huge.

Bulleted Lists

- Use \item between \begin{itemize} and an \end{itemize} to create a bulleted list.

```
\begin{itemize}
  \item A bulleted item.
  \item Another bulleted item.
  \begin{itemize}
    \item A nested bulleted item.
  \end{itemize}
  \item You get the idea.
\end{itemize}
```

produces

- A bulleted item.
- Another bulleted item.
  - A nested bulleted item.
- You get the idea.

Numbered Lists

- Use \item between \begin{enumerate} and an \end{enumerate} to create a numbered list.

```
\begin{enumerate}
  \item A numbered item.
  \item Another numbered item.
  \begin{enumerate}
    \setcounter{enumii}{4}
    \item A nested numbered item.
  \end{enumerate}
  \item You get the idea.
\end{enumerate}
```

produces

1. A numbered item.
2. Another numbered item.
    5. A nested numbered item.
3. You get the idea.

Description Lists

- Use \item[] between \begin{itemize} and an \end{itemize} to create a Description list.

```
\begin{itemize}
  \item[First] A numbered item.
  \item[Second] Another numbered
item.
  \itemitem[Third] You get the idea.
\end{itemize}
```

produces

First A description item.

Second Another description item.

Third You get the idea.

List Exercise

Exercise: 7 Write LateX code to generate following list.

This is a great list to practice on:

- let's make some embedded lists
  1. different types of lists can be nested
  2. you can also write math inside a list: $x = a + b^2$
- here are directions for a nested list

  first to nest a list, just insert a begin-item-end sequence between items

  second it's that easy!
- try "description" for labeled lists with \item[descriptionname] list content

Some Important Commands

- For two column document class use: \documentclass[twocolumn]{article}
- If you want to make the article class two-sided: use \documentclass[twoside]{article}
- To set the page size, add the following after \documentclass:
  \usepackage{geometry}

  \geometry{a4paper}
  - a0paper, a1paper, ..., a6paper,
  - b0paper, b1paper, ..., b6paper,
  - letterpaper,
  - legalpaper,
  - executivepaper
- For custom page size: \geometry{paperwidth=5.5in, paperheight=8.5in}

Some Important Commands

- To specifies the style of page numbers use:
  \pagenumbering{num_style}
- Possible values of num_style are:

  arabic: Arabic numerals

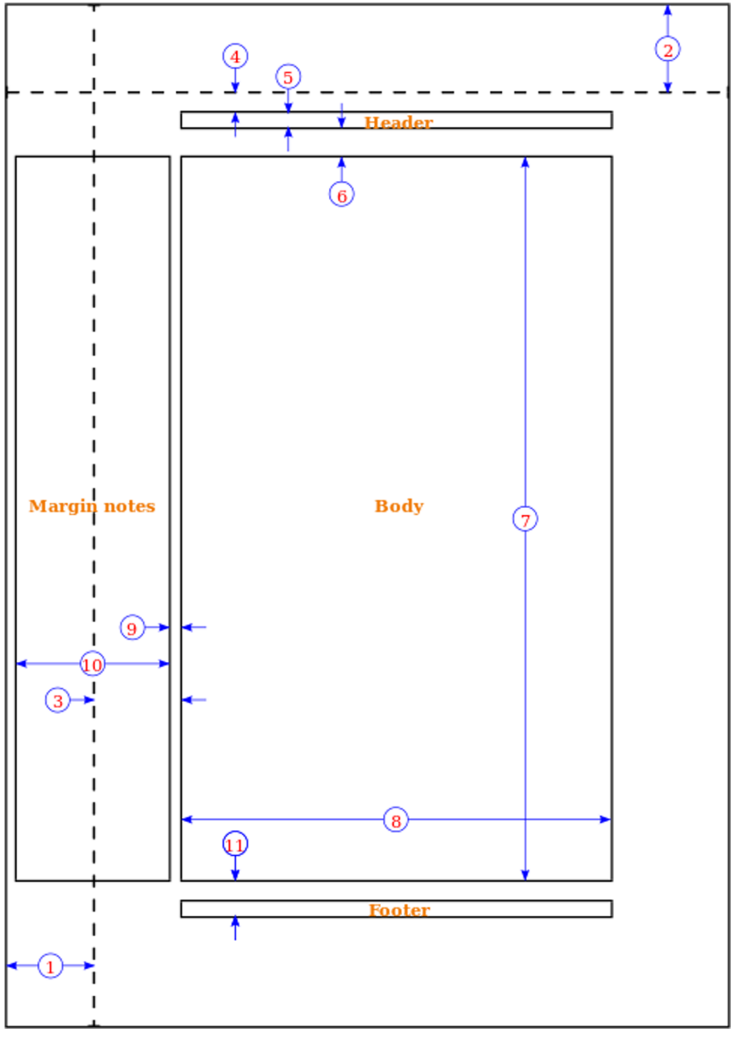
  roman: Lowercase roman numerals

  Roman: Uppercase roman numerals

  alph: Lowercase letters

  Alph: Uppercase letters

Page Margin



1. \hoffset
2. \voffset
3. \oddsidemargin = 31pt
4. \topmargin = 20pt
5. \headheight = 12pt
6. \headsep = 25pt
7. \textheight = 592pt
8. \textwidth = 390pt
9. \marginparsep = 10pt
10. \marginparwidth = 35pt
11. \footskip = 30pt

- \hoffset = 0pt
- \voffset = 0pt
- \paperwidth = 597pt
- \paperheight = 845pt

Page Margin

!!USE TEMPLATES!!

Math mode for writing equations

Two ways in which one can write equations:

- Use $ Equation here $
  - Typically used inside a text or paragraph
- Use \begin{equation}
  write a single line equation here
  \end{equation}

  Use package amsmath
- Instead of equation other commands that can be used are: align, multiline etc.

Math mode for writing equations

Task: Try these commands

\hat{x}, \tilde{x}, \dot{x}, \ddot{x}

\le ,\ge, \left[, \right], \left(, \right)

Result:

$$\hat{x}, \tilde{x}, \dot{x}, \ddot{x}, \leq, \geq, [] , ()$$

Math mode for writing equations

Greek characters

α	\alpha	θ	\theta	o	o	τ	\tau
β	\beta	ϑ	\vartheta	π	\pi	υ	\upsilon
γ	\gamma	γ	\gamma	ϖ	\varpi	ϕ	\phi
δ	\delta	κ	\kappa	ρ	\rho	φ	\varphi
ϵ	\epsilon	λ	\lambda	ϱ	\varrho	χ	\chi
ε	\varepsilon	μ	\mu	σ	\sigma	ψ	\psi
ζ	\zeta	ν	\nu	ς	\varsigma	ω	\omega
η	\eta	ξ	\xi				

Γ	\Gamma	Λ	\Lambda	Σ	\Sigma	Ψ	\Psi
Δ	\Delta	Ξ	\Xi	Υ	\Upsilon	Ω	\Omega
Θ	\Theta	Π	\Pi	Φ	\Phi		

Ref: http://web.ift.uib.no/Teori/KURS/WRK/TeX/symALL.html

Math mode for writing equations

Relation symbols

$\leq$	\leq	$\geq$	\geq	$\equiv$	\equiv	$\models$	\models
$\prec$	\prec	$\succ$	\succ	$\sim$	\sim	$\perp$	\perp
$\preceq$	\preceq	$\succeq$	\succeq	$\simeq$	\simeq	$\mid$	\mid
$\ll$	\ll	$\gg$	\gg	$\asymp$	\asymp	$\parallel$	\parallel
$\subset$	\subset	$\supset$	\supset	$\approx$	\approx	$\bowtie$	\bowtie
$\subseteq$	\subseteq	$\supseteq$	\supseteq	$\cong$	\cong	$\Join$	\Join[b]
$\sqsubset$	\sqsubset[b]	$\sqsupset$	\sqsupset[b]	$\neq$	\neq	$\smile$	\smile
$\sqsubseteq$	\sqsubseteq	$\sqsupseteq$	\sqsupseteq	$\doteq$	\doteq	$\frown$	\frown
$\in$	\in	$\ni$	\ni	$\propto$	\propto	$=$	=
$\vdash$	\vdash	$\dashv$	\dashv	$<$	<	$>$	>
$:$	:						

Inserting Equation

Example 1:

```
\begin{equation}\label{eq:Addition}
a = b + c
\end{equation}
```

$$a = b + c$$

Example 2:

```
\begin{equation}\label{eq:Addition}
x^2 = y^3 + z_7
\end{equation}
```

$$x^2 = y^3 + z_7$$

Example 3:

```
\begin{equation} \label{eq:Xbase}
x_2 = y_34 + z_{71} + a_83^ 94 +  b_{12}^{56}
\end{equation}
```

$$x_2 = y_34 + z_{71} + a_83^94 + b_{12}^{56}$$

Example 4:

```
\begin{equation} \label{eq:SumOfSum}
S_{ij} = \frac{n}{100} \sum_{i}^ {10}
\sum_{j}^{10} ( x_i + x_{ij} )
\end{equation}
```

$$S_{ij} = \frac{n}{100} \sum_{i}^{10} \sum_{j}^{10} (x_i + x_{ij})$$

No-number Equation

Example 1:

```
\begin{equation*}\label{eq:Addition}
a = b + c
\end{equation*}
```

Note: Insert mathematical expressions within text using $ sign i.e. $a+b$

Additional features in a math mode

\begin{align}: multi-line equations with alignment.

Example:

```
\begin{align}
2x - 5y &=  8 \\
3x + 9y &=  -12
\end{align}

\begin{align*}
x&=y    &  w &=z  \\
2x&=-y  &  3w&=\frac{1}{2}z \\
-4 + 5x&=2+y &  w+2&=-1+w
\end{align*}
```

Output:

$$2x - 5y = 8 \quad (1)$$
$$3x + 9y = -12 \quad (2)$$

$$x = y \qquad w = z$$
$$2x = -y \qquad 3w = \frac{1}{2}z$$
$$-4 + 5x = 2 + y \qquad w + 2 = -1 + w$$

\nonumber: removes numbers for an equations.

Additional features in a math mode

\begin{multiline}: command to enter long equations

```
\begin{multline*}
p(x) = 3x^6 + 14x^5y + 590x^4y^2 + 19x^3y^3\\
- 12x^2y^4 - 12xy^5 + 2y^6 - a^3b^3
\end{multline*}
```

$$p(x) = 3x^6 + 14x^5y + 590x^4y^2 + 19x^3y^3 - 12x^2y^4 - 12xy^5 + 2y^6 - a^3b^3$$

Equations

Exercise 8. Equation writing

- Make a LaTeX file which produces the output shown in the pdf file **Ex8.pdf**

Labelling Standards

- For Equations : \label{**eq:**Addition}
- For Tables : \label{**table:**AnalysisResult}
- For Figure : \label{**fig:**Methodology}
- For Section :\label{**sec:**Methodology}

Inserting Tables

```
\begin{tablular}{ l c r p }

Table contents

\end{tabular}
```

- Four columns table
- **l for left, c for center, r for right, p for paragraph**

Inserting Tables

Example 1:

```
\begin{tabular}{ l c r
}
  1 & 2 & 3 \\
  4 & 5 & 6 \\
  7 & 8 & 9 \\
\end{tabular}
```

1	2	3
4	5	6
7	8	9

Example 2:

```
\begin{tabular}{ l | c || r
}
  1 & 2 & 3 \\
  4 & 5 & 6 \\
  7 & 8 & 9 \\
\end{tabular}
```

1	2	3
4	5	6
7	8	9

Inserting Tables

Example 3:

```
\begin{tabular}{ l | c || r }
  \hline
  1 & 2 & 3 \\
  4 & 5 & 6 \\
  7 & 8 & 9 \\
  \hline
\end{tabular}
```

1	2	3
4	5	6
7	8	9

Example 4:

```
\begin{center}
  \begin{tabular}{ l | c || r }
    \hline
    1 & 2 & 3 \\ \hline
    4 & 5 & 6 \\ \hline
    7 & 8 & 9 \\
    \hline
  \end{tabular}
\end{center}
```

1	2	3
4	5	6
7	8	9

Inserting Tables

Example 5:

```
\begin{center}
    \begin{tabular}{| l | l | l | l |}
    \hline
    Day & Min Temp & Max Temp & Summary \\ \hline
    Monday & 11C & 22C & A clear day with lots of sunshine.
    However, the strong breeze will bring down the temperatures. \\ \hline
    Tuesday & 9C & 19C & Cloudy with rain, across many northern regions. Clear spells
    across most of Scotland and Northern Ireland,
    but rain reaching the far northwest. \\ \hline
    Wednesday & 10C & 21C & Rain will still linger for the morning.
    Conditions will improve by early afternoon and continue
    throughout the evening. \\
    \hline
    \end{tabular}
\end{center}
```

Day	Min Temp	Max Temp	Summary
Monday	11C	22C	A clear day with lots of sunshine. However, the strong breeze w
Tuesday	9C	19C	Cloudy with rain, across many northern regions. Clear spells ac
Wednesday	10C	21C	Rain will still linger for the morning. Conditions will improve by

Inserting Tables

Example 6:

```
\begin{center}
    \begin{tabular}{ | l | l | l | p{5cm} |}
    \hline
    Day & Min Temp & Max Temp & Summary \\ \hline
    Monday & 11C & 22C & A clear day with lots of sunshine.
    However, the strong breeze will bring down the temperatures. \\ \hline
    Tuesday & 9C & 19C & Cloudy with rain, across many northern regions. Clear spells
    across most of Scotland and Northern Ireland,
    but rain reaching the far northwest. \\ \hline
    Wednesday & 10C & 21C & Rain will still linger for the morning.
    Conditions will improve by early afternoon and continue
    throughout the evening. \\
    \hline
    \end{tabular}
\end{center}
```

Day	Min Temp	Max Temp	Summary
Monday	11C	22C	A clear day with lots of sunshine. However, the strong breeze will bring down the temperatures.
Tuesday	9C	19C	Cloudy with rain, across many northern regions. Clear spells across most of Scotland and Northern Ireland, but rain reaching the far northwest.
Wednesday	10C	21C	Rain will still linger for the morning. Conditions will improve by early afternoon and continue throughout the evening.

Inserting Tables

Example 7:

```
\begin{tabular}{ |l|l| }
  \hline
  \multicolumn{2}{|c|}{Team sheet} \\
  \hline
  GK & Paul Robinson \\
  LB & Lucus Radebe \\
  DC & Michael Duberry \\
  DC & Dominic Matteo \\
  RB & Dider Domi \\
  MC & David Batty \\
  MC & Eirik Bakke \\
  MC & Jody Morris \\
  FW & Jamie McMaster \\
  ST & Alan Smith \\
  ST & Mark Viduka \\
  \hline
\end{tabular}
```

Team sheet	
GK	Paul Robinson
LB	Lucus Radebe
DC	Michael Duberry
DC	Dominic Matteo
RB	Dider Domi
MC	David Batty
MC	Eirik Bakke
MC	Jody Morris
FW	Jamie McMaster
ST	Alan Smith
ST	Mark Viduka

Adding Caption to Tables

```
\begin{table}
   \begin{tablular}{ l c r p }
   \end{tabular}
   \caption{}
   \label{}
\end{table}
```

Tables

Exercise 10(a). Making Tables

- Write Latex code which produces following output.

Number	Full Equation
a	$\xi = \alpha$
b	$\Xi = \beta^2$
c	$\zeta = \phi + \epsilon$
δ	$z = p + e$

Table 1: Move the caption to the bottom by putting the caption command under the end of "tabular". Add additional lines by simply repeating a \midrule (etc.) where desired. Use "r" for right and "l" for left alignment. Place the "|" symbol between the appropriate alignment letters for a vertical line as desired.

Tables

Exercise 10(b). Making Tables

- Write Latex code which produces following output.

Table: Table Type Styles

Table Head	**Table Column Head**		
	Table column subhead	***Subhead***	***Subhead***
copy	More table copy[a]		

[a]Sample of a Table footnote.

Inserting Figures

`Add Package:  \usepackage{graphicx}`

Example 1:

```
\begin{figure}
\includegraphics{FiguresName} % figure
\caption{Result}  %Caption
\label{fig:Result}  %Label
\end{figure}
```

Example 2:

```
\begin{figure}
\includegraphics[height=3cm, width=3cm]{FiguresName} % figure
\caption{Result}  %Caption
\label{fig:Result}  %Label
\end{figure}
```

Subfigures

`Add Package: \usepackage{subfigure}`

Example 1:

```
\begin{figure}
\subfigure[Subfigure 1]
{\includegraphics[height=3cm,width=3cm]{Koala.jpg}}~~~~
\subfigure[Subfigure 2]
{\includegraphics[height=3cm,width=3cm]{Penguins.jpg}}
\caption{Result}  %Caption
\label{fig:Result}  %Label
\end{figure}
```

(h) Subfigure 1

(i) Subfigure 2

Figure: Result

Inserting figures in document

Exercise 11. Making Figures

- Write Latex code for the content given in **Ex11- figures.pdf**.

!!Compile & Run Multiple Times!!

Dealing with large documents

Environment Setup

Internet Setting and error handling for Packages

!!.. Demonstration ..!!

Inserting References

- Insert following two commands at the end of document, before **\end{document}**
- Simplest way to make bibliography file is by using JabRef

\bibliographystyle{plain}

\bibliography{references}

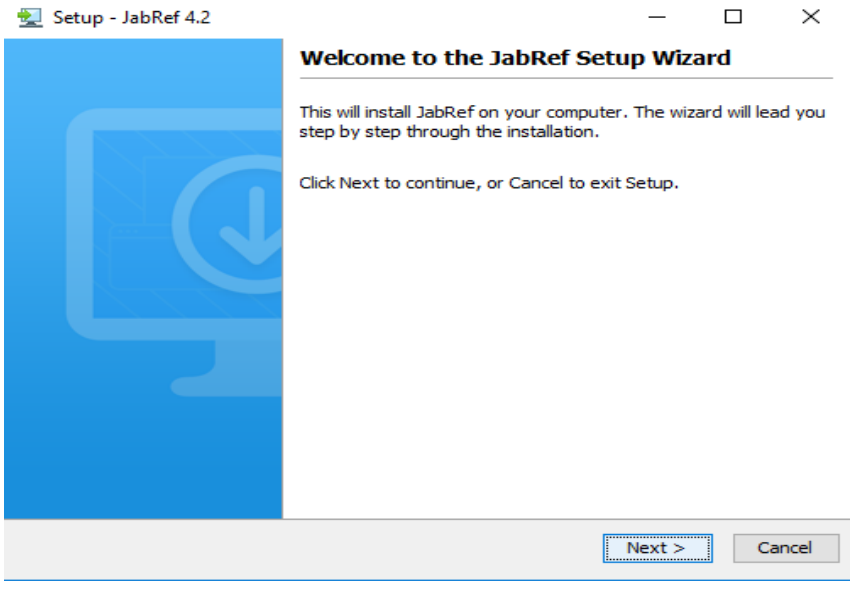
JabRef on Windows

(a) Step 1: Download the JabRef: http://www.jabref.org/.

JabRef on Windows

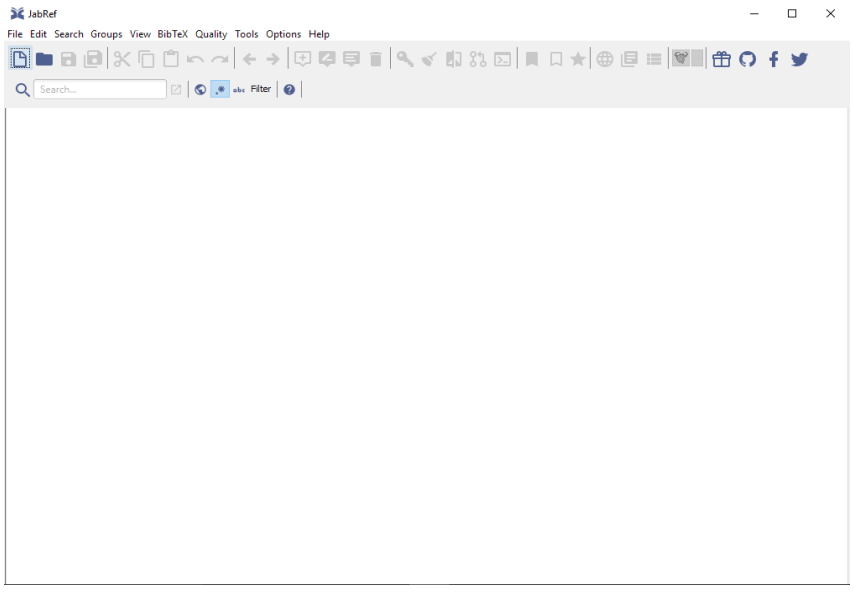
- Step 2: Install/update Java Runtime Environment

JabRef on Windows



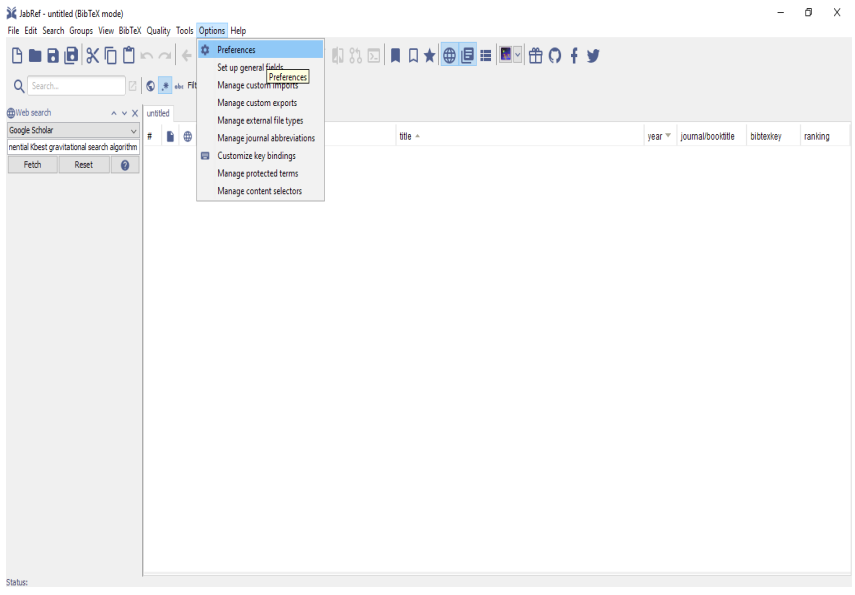
(b) Step 3: Install the JabRef.

JabRef on Windows



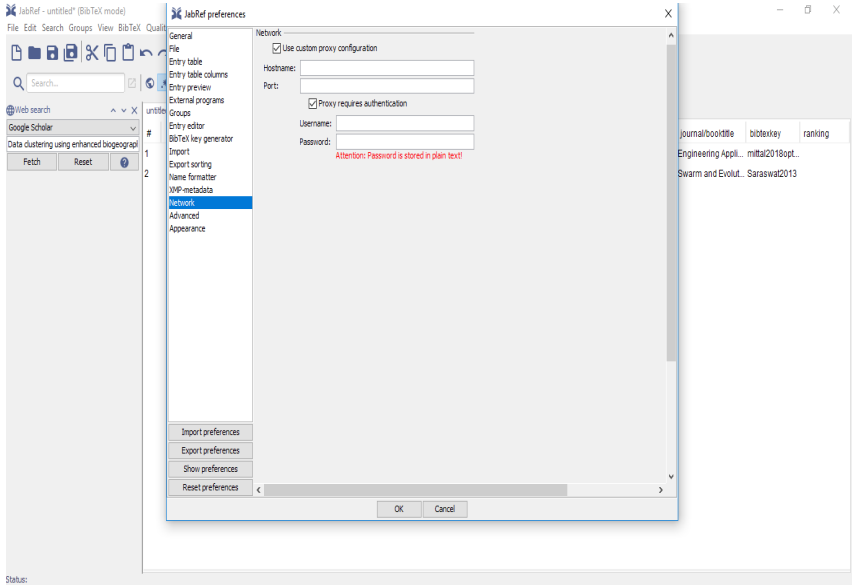
(c) Step 4: Open the JabRef and create new JabRef file by clicking the top-left symbol.

JabRef on Windows



(d) Step 5: If on network, setup the connection settings by selecting the preferences.

JabRef on Windows



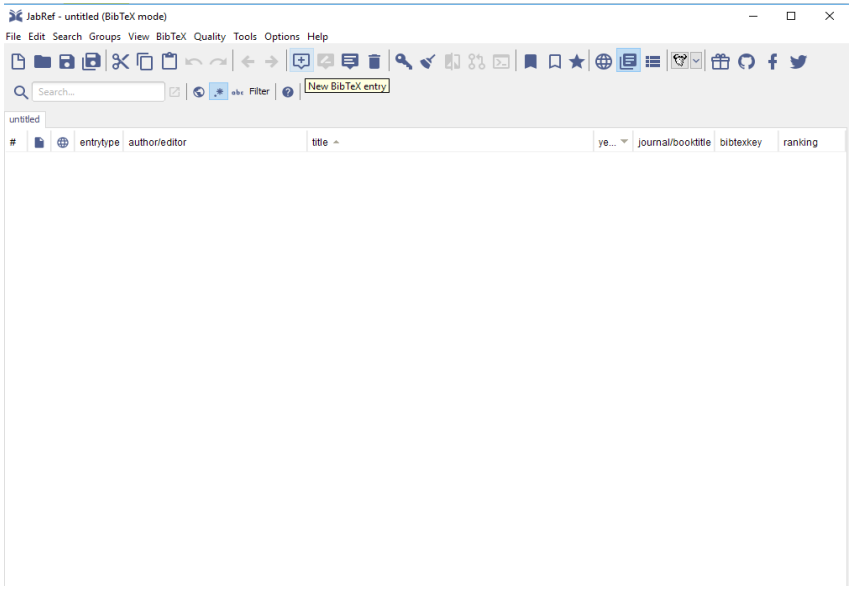
(e) Step 6: Select 'Network 'option and the required details.

JabRef on Windows

- Generally, BibTex key of paper can be generated in three ways:
  - Manually
  - Using DOI
  - Using Paper name

JabRef on Windows

1^{st} way: Manual

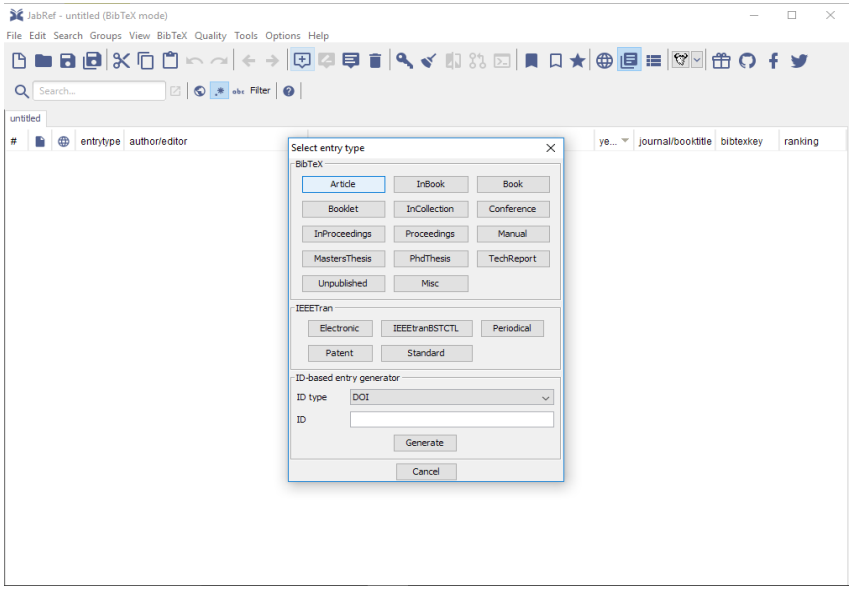


(f) Step 1: Click on + symbol.

Figure:

JabRef on Windows

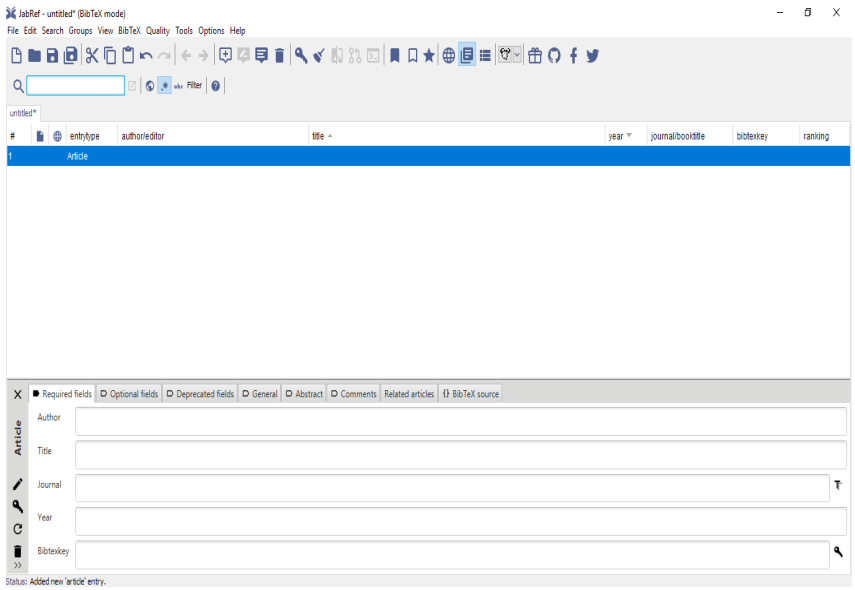
1^{st} way: Manual



(a) Step 2: Select ‘Article ’on the popup window.

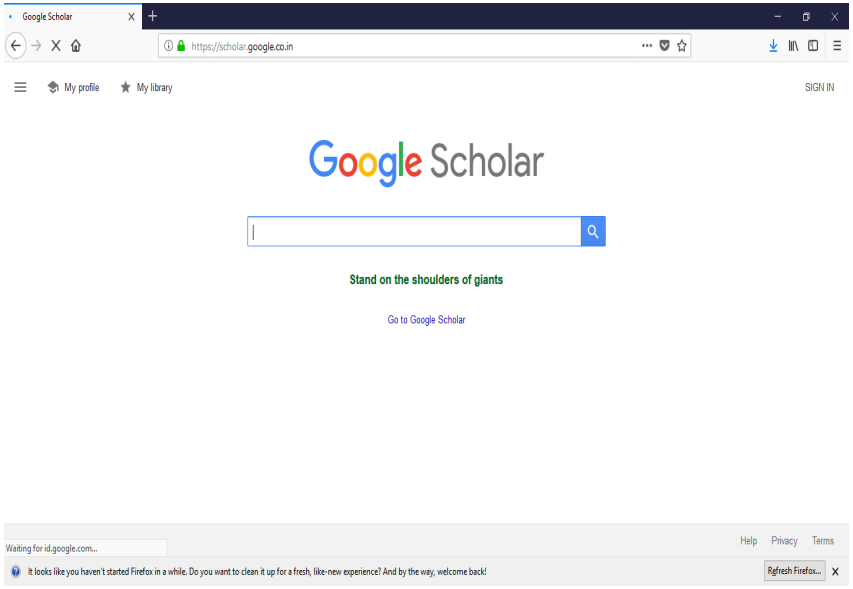
JabRef on Windows

1^{st} way: Manual



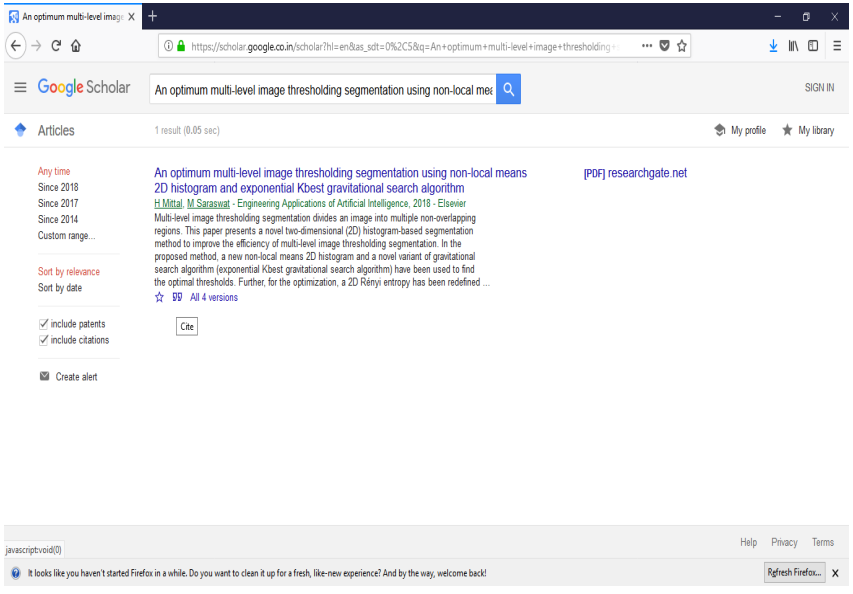
(b) Step 3: Window will be like this.

JabRef on Windows
1^{st} way: Manual



(c) Step 4: Fetch the BibTex key online.

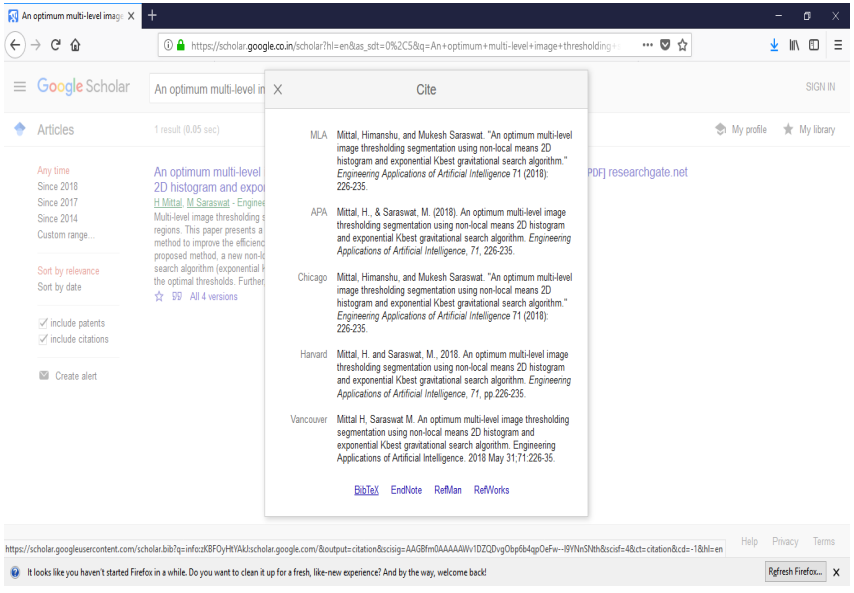
JabRef on Windows
1^{st} way: Manual



(d) Step 5: Click on the 'Cite'.

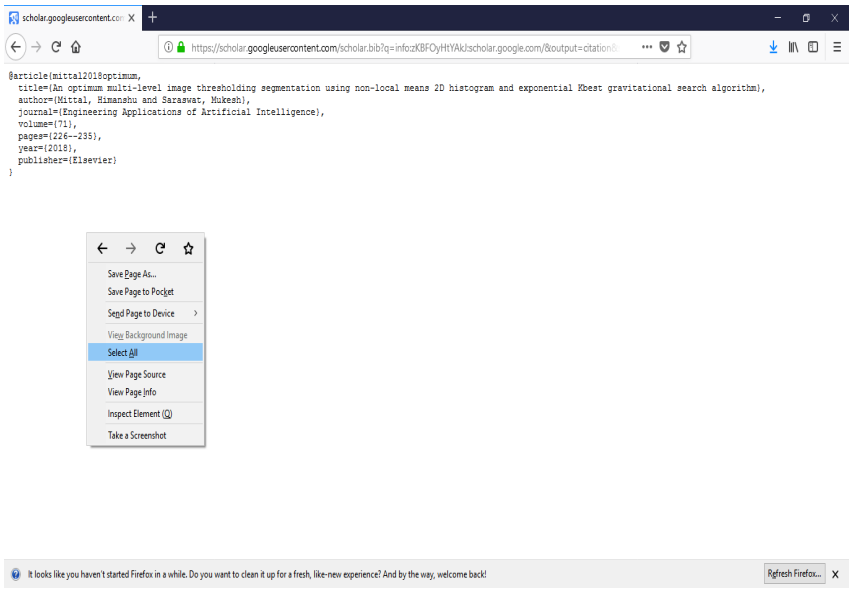
JabRef on Windows

1^{st} way: Manual

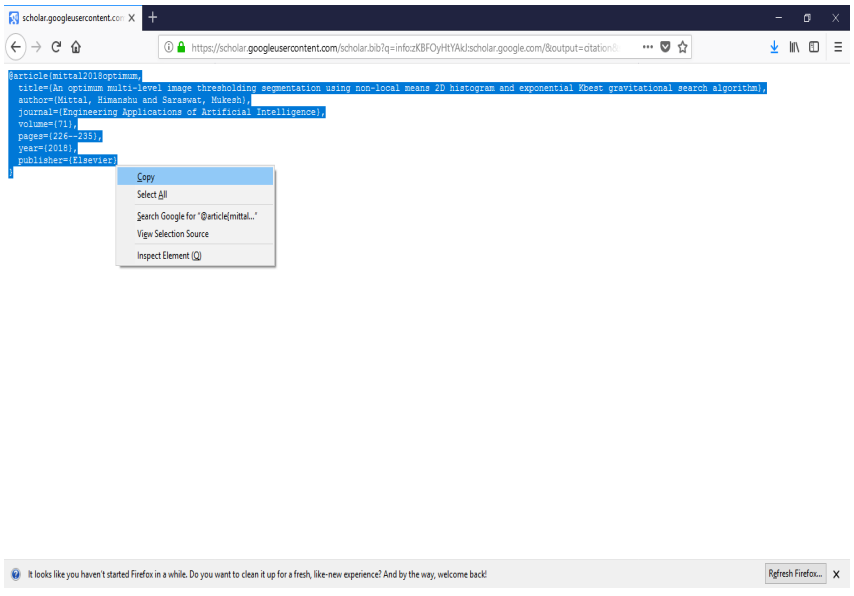


(e) Step 6: Click on the 'BibTex'.

JabRef on Windows
1st way: Manual



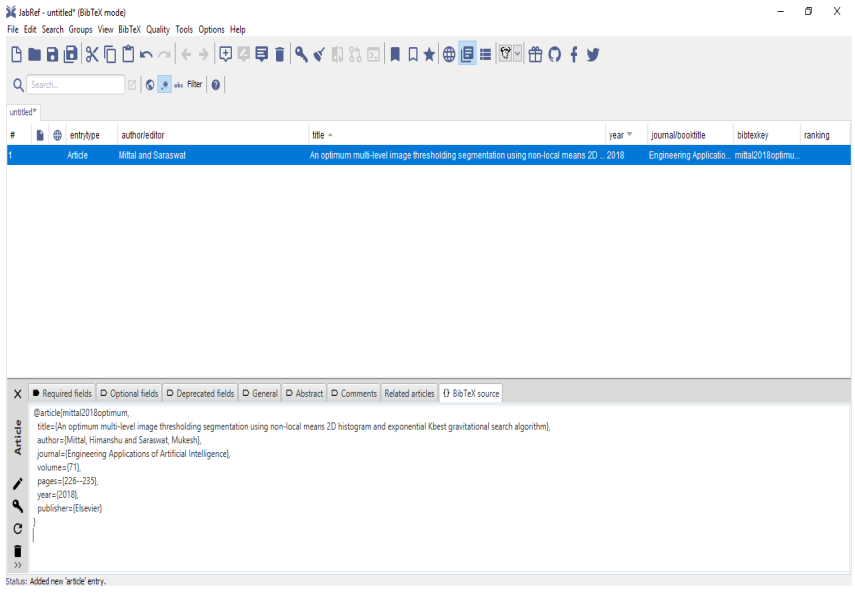
(f) Step 7a: Select the BibTex content.



(g) Step 7b: Copy the BibTex content.

JabRef on Windows

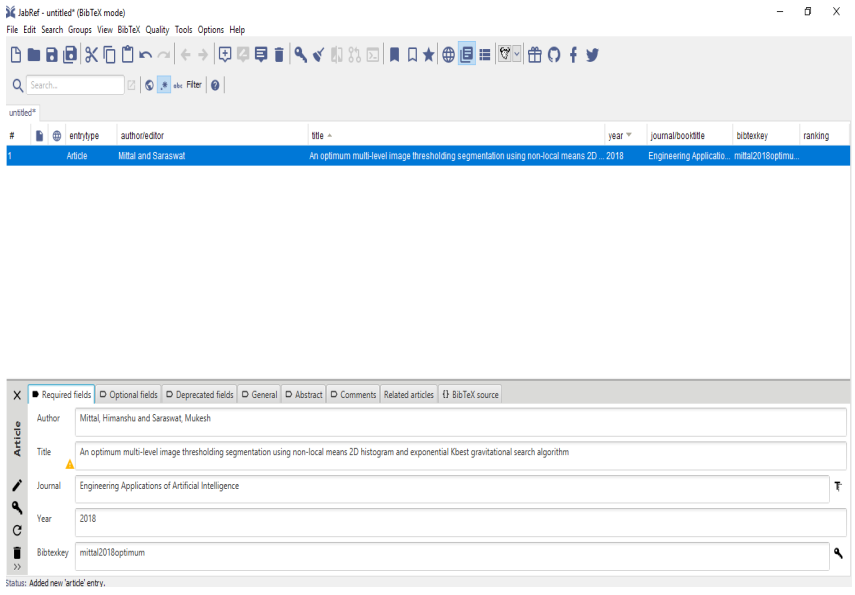
1^{st} way: Manual



(h) Step 8: Go to JabRef window, click the 'Bib-Tex source 'tab, and paste the copied text.

JabRef on Windows

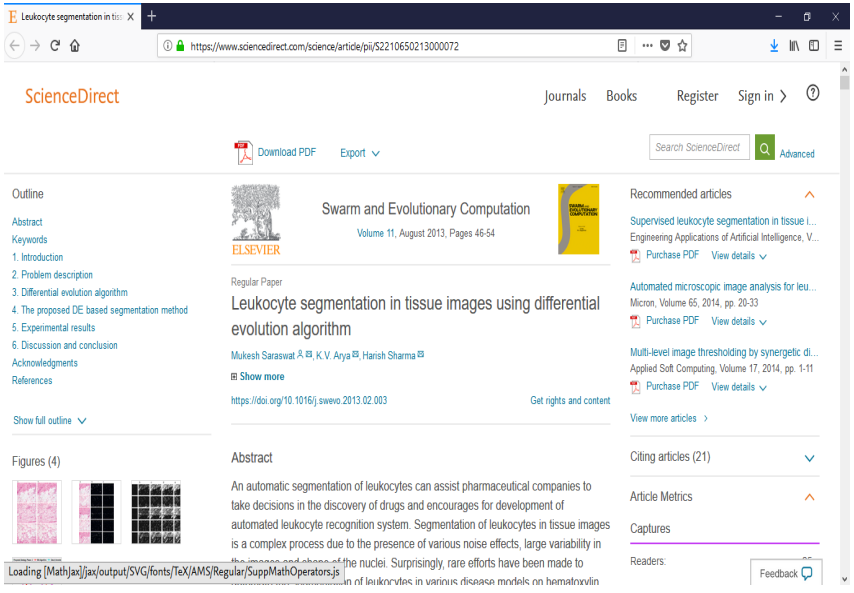
1^{st} way: Manual



(i) Step 9: Check the entries, if required to.

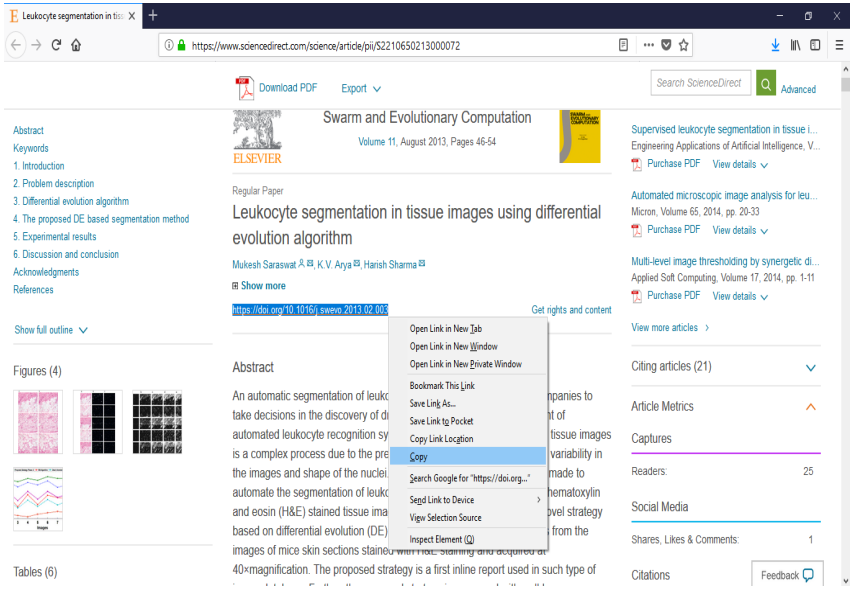
Figure:

JabRef on Windows
2nd way: DOI



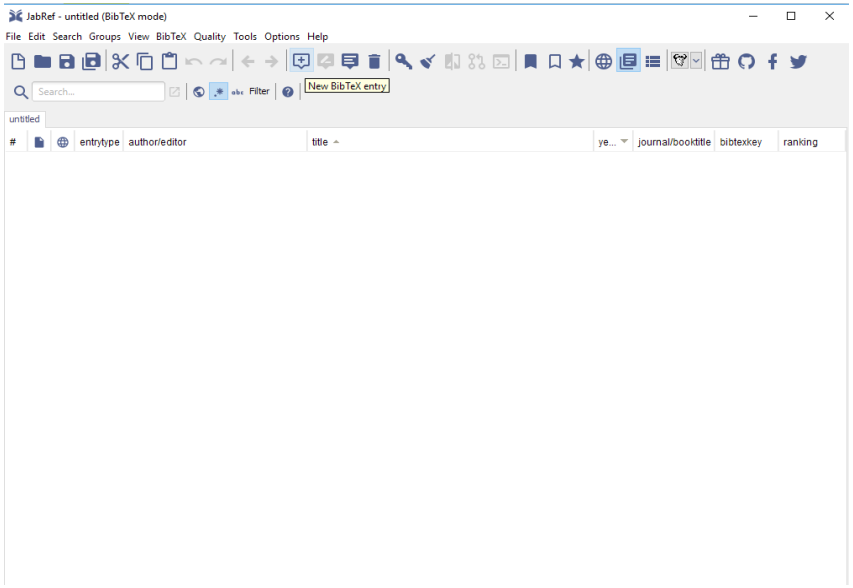
(a) Step 1: Go to the paper online.

JabRef on Windows
2^{nd} way: DOI



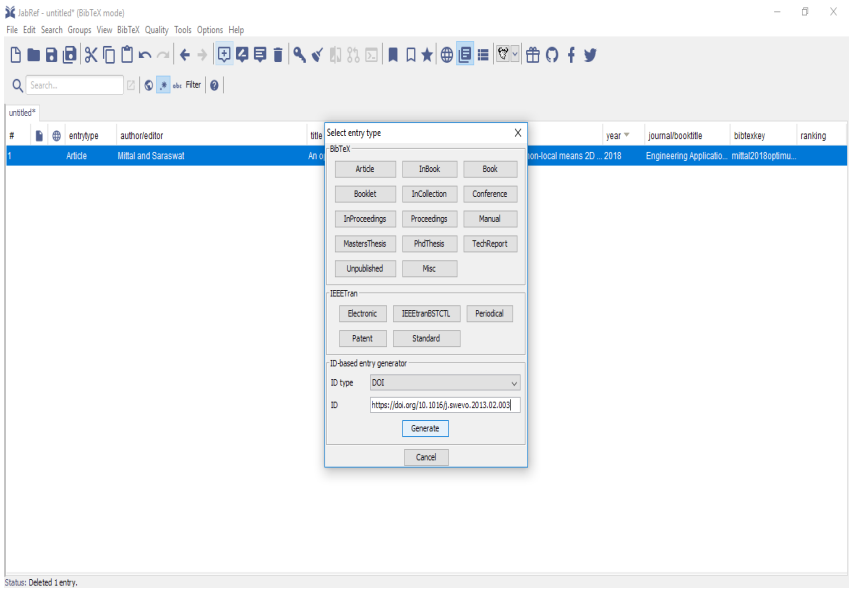
(b) Step 2: Copy the 'DOI 'of the paper.

JabRef on Windows
2^{nd} way: DOI



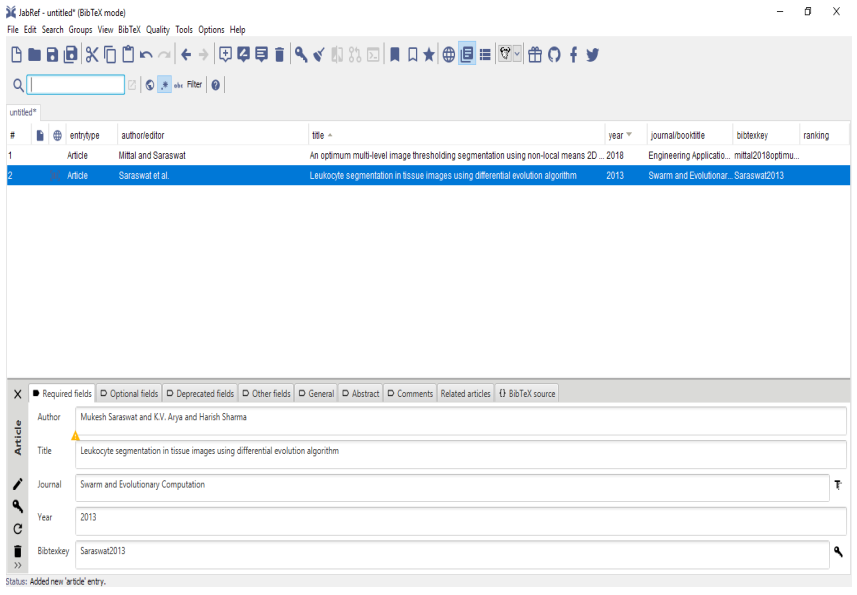
(c) Step 3: Click on + symbol.

JabRef on Windows
2nd way: DOI



(d) Step 4: Entry the 'DOI 'of the paper at the bottom of the popup window.

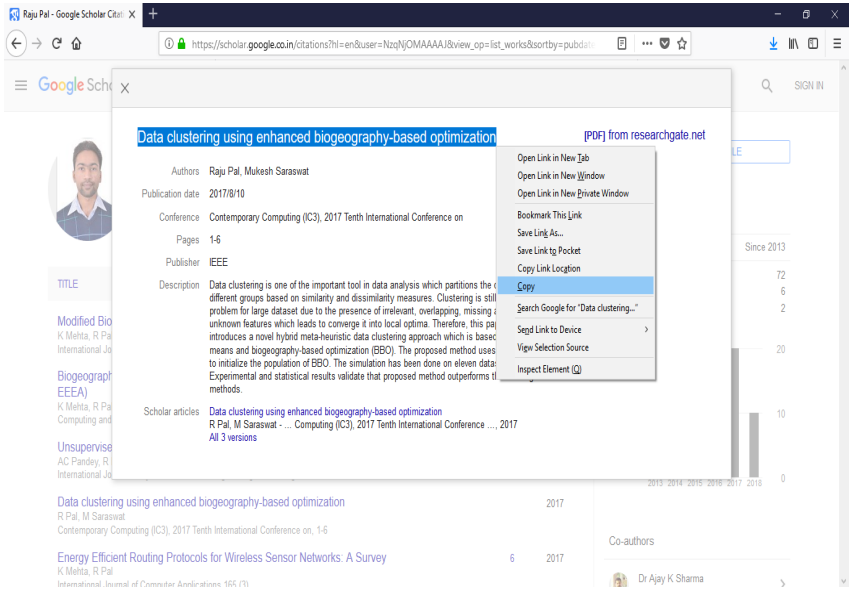
JabRef on Windows
2nd way: DOI



(e) Step 5: JafRef will have the entry like this.

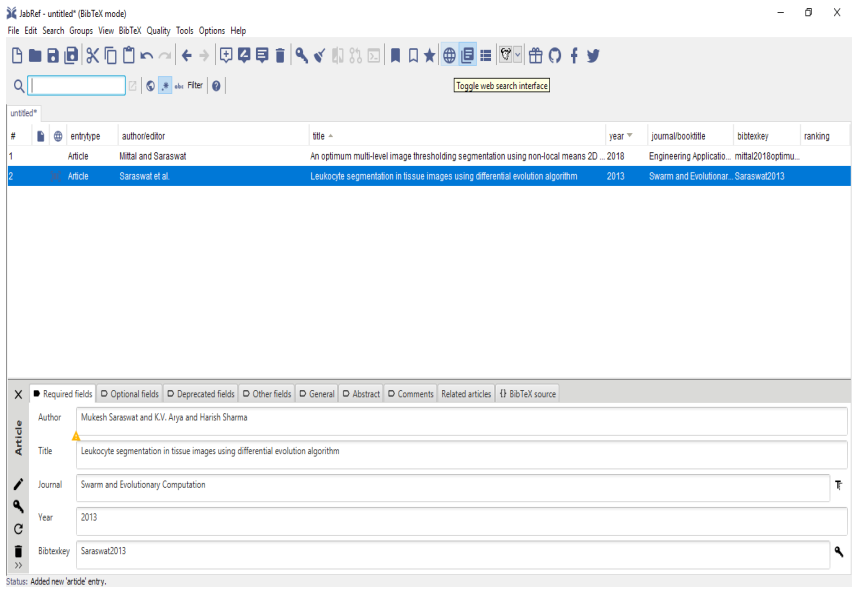
Figure:

JabRef on Windows
3^{rd} way: DOI



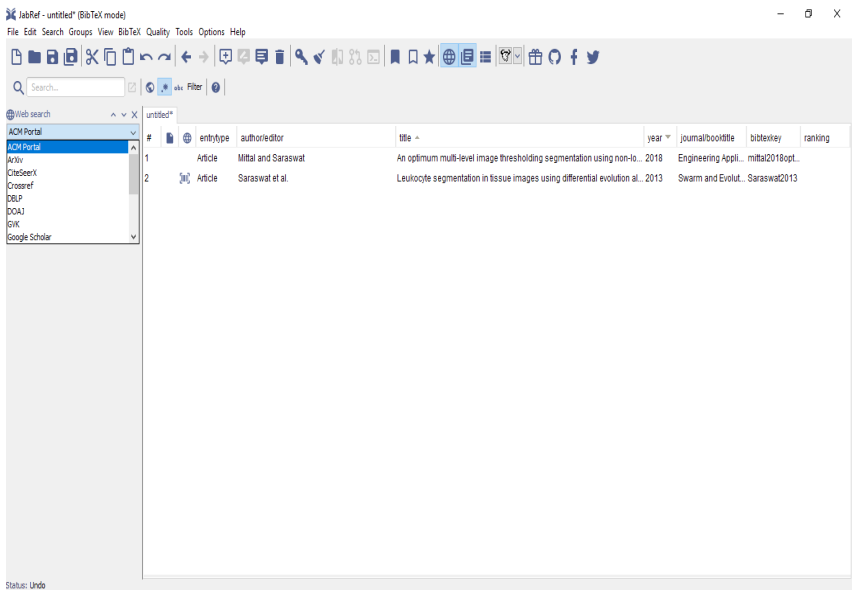
(a) Step 1: Copy the paper name

JabRef on Windows
3rd way: DOI



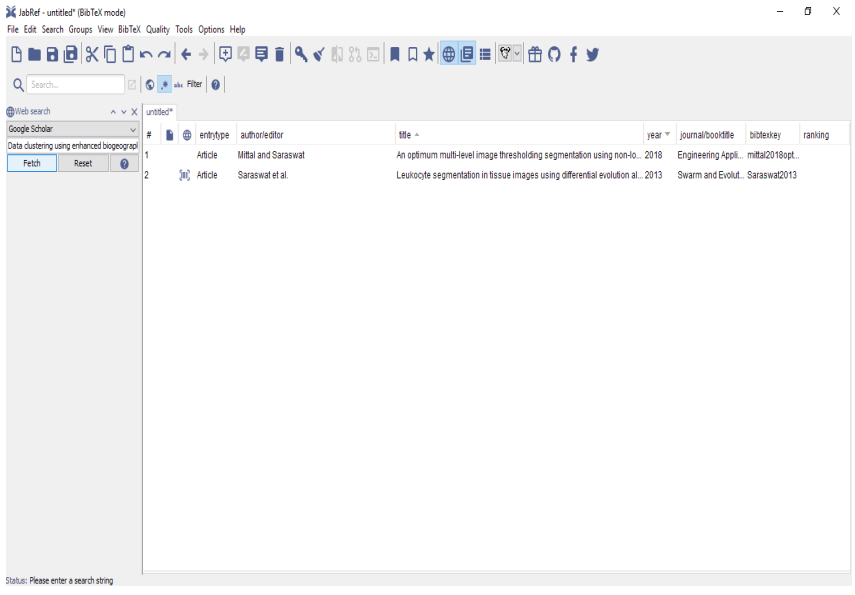
(b) Step 2: Click on the web search option.

JabRef on Windows
3rd way: DOI



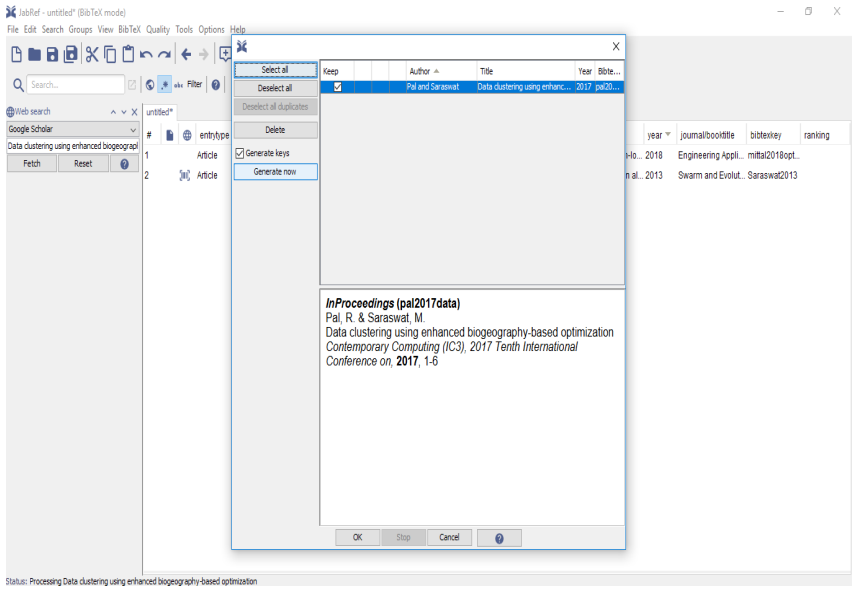
(c) Step 3: Select the appropriate web source.

JabRef on Windows
3rd way: DOI



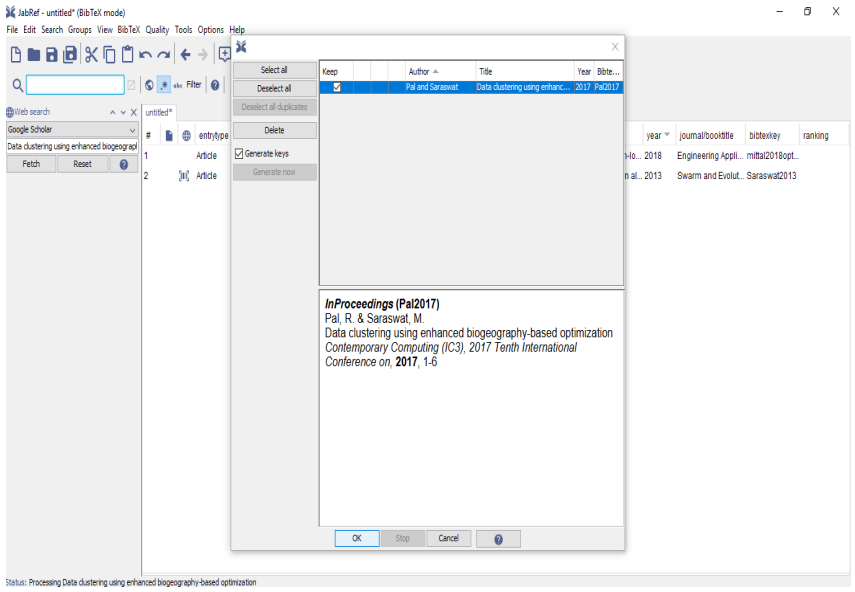
(d) Step 4: Enter the paper name and click ‘Fetch ’.

JabRef on Windows
3rd way: DOI



(e) Step 5: Click 'Generate Now 'after selecting the appropriate paper.

JabRef on Windows
3rd way: DOI



(f) Step 6: Click 'OK '.

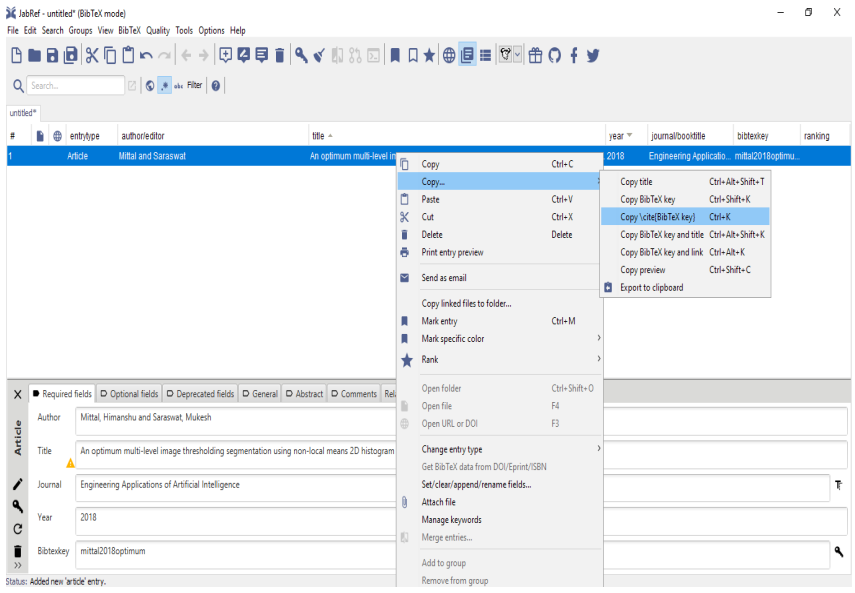
Figure:

BibTex key in Paper

- There are two ways to enter the BibTex key in paper:
  - Manually
  - Push: Can't use with MikTex

BibTex key in Paper

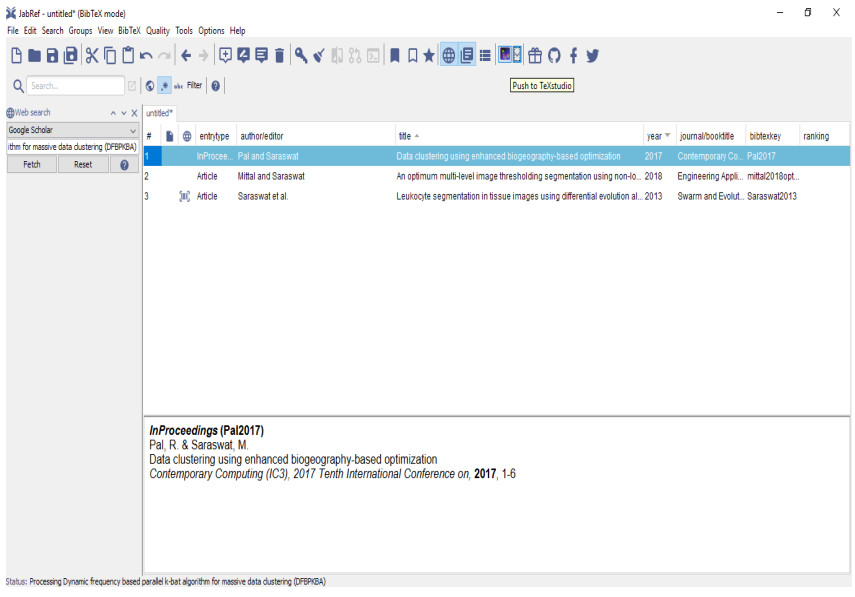
1st way: Manual



(a) Step 1.1: Rightclick the required entry in JabRef, select the highlighted option, and paste in the desired location in paper.

BibTex key in Paper

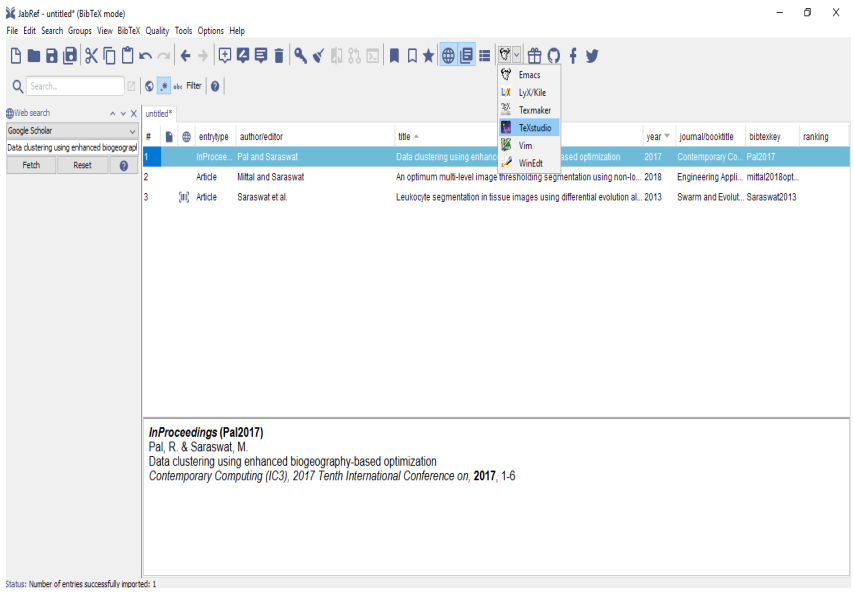
2^{nd} way: Push



(b) Step 2.1: Place the mouse cursor at desired location in paper and select the 'Push 'in JabRef.

BibTex key in Paper

2^{nd} way: Push



(c) Step 2.2: In JabRef, other IDE can be selected too.

Saving BibTex File

- Click the ‘save ’symbol in JabRef.
- Select the location and name of the BibTex File.
- A file of entered name with ‘.bib ’extension will be created in the selected location.
- Remember: the $*$ on the name of the JabRef file means changes are not saved.

Learning by doing

Exercise 13:

- Using Google Scholar (scholar.google.com), search for the following: "An optimum multi-level image thresholding segmentation using non-local means 2D histogram and exponential Kbest gravitational search algorithm "
- Note the top hitting article, click on **cite** at the bottom of the entry, and click on **bibtex** at the bottom of the pop up window.
- Copy and paste the information into a new file called **mybib·bib**.

Thank You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