# ALAP USER GUIDE

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1. ALAP:

1.1. Introduction and Scope:

Latex is a document preparation system which is widely used in academia for the publication of technical and scientific documents. Latex allows the author to focus on the content and takes care of the formatting and layout of the document. One of the main reasons behind popularity of Latex in academia and scientific community is the simplicity it offers while constructing even complex math equations. Unfortunately all the existing Latex editors are either completely inaccessible or partially accessible, because of the inability of screen readers (e.g. JAWS, NVDA) to read mathematical expressions. So, the purpose of ALAP is to offer an accessible Latex editor with special focus on math. To minimize the novelty factor we extended an already existing Latex editor, “TeXlipse” which is an eclipse plugin. Four main features of ALAP are Assistive Editor, Debugging, Math Mode and Accessible PDF which is discussed in detail below along with the complete guide about setting up ALAP on your own PC.

Please read the following user guide to find out “how-to-use” ALAP.

2. Download and Installation:

2.1. Download:

To download ALAP, please visit https://alap.lums.edu.pk/index.php/downloads/ and click on the “Download ALAP system” link. You will be led to another page, where you can download the zip file of ALAP by clicking on the “Download” button.

Upon completion of the download, simply decompress the file “plugin.zip” and save it at any location on the computer.

2.2. Configuring ALAP and MiKTeX

Since ALAP relies on MiKTeX for the compilation of latex documents, you need to have it pre-installed on your system. If MiKTeX is already installed on your PC in the default directory “C:\Program Files\MiKTeX 2.9\”, you don’t have to do anything further. If not, simply click on the link below to download and install it.

https://miktex.org/download

If MiKTeX is installed but not in the default directory i.e. “C:\Program Files\MiKTeX 2.9\”, you must manually configure the required “Builder Settings” of ALAP.
2.2.1 Manual Configuration of Builder Settings:

To manually configure the builder settings, run ALAP and navigate to Window->Preferences->TeXclipse->Builder Settings, then click on the “browse” button to navigate to the bin directory of TeX distribution i.e. “~\MiKTeX 2.9\miktex\bin\x64”

Finally click “apply” and then “OK” to exit the pop up box. Keep in mind though that you can simply omit this step if MiKTeX is installed in the default directory.
2.3. Installing and Running ALAP:

There’s no explicit installation required to run ALAP. Once you have decompiled the downloaded file simply navigate to Plugin->Eclipse->ALAP.exe, double click it and run the application.

2.4. Creating Your First Project:

Once you’ve ALAP up and running, go to File-> New -> Project. A dialog box will open up; simply press “next” after selecting “LaTeX project”.

This will lead you to yet another dialogue box, which will allow you to name your project and select a template for the LaTeX document.
Finally, click on the “Finish” button. Your project will be created and a LaTeX editor containing some basic template text will open up along with an addition of few new buttons in your menu bar.
3. Using ALAP:

3.1. Editor Accessibility:

ALAP helps visually impaired latex users in editing and creating latex documents, by providing the functionality of cursor mode with two different verbosity levels i.e. character and word.

3.1.1. Cursor Mode:

The purpose of cursor mode is to assist users while editing the document by providing consistent real time feedback of the stuff being typed. The speech model of ALAP caters symbols, special characters and plain text elements equally. Cursor Mode can be enabled and disabled by using the shortcut key CAPS+H. To set and manipulate the verbosity level, following set of shortcut keys are available.

<table>
<thead>
<tr>
<th>Verbosity Level</th>
<th>Shortcut Keys and Functionalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word</td>
<td>• Shortcut key CAPS_LOCK + W</td>
</tr>
<tr>
<td></td>
<td>• Narrates output in Word Mode</td>
</tr>
<tr>
<td></td>
<td>• Ctrl + -&gt; / Ctrl + &lt;- to narrate the next/ previous word respectively</td>
</tr>
</tbody>
</table>
### 3.1.2. Editor Shortcut Keys:

ALAP also exposes the following set of keyboard shortcut keys that allows users to navigate the document smoothly and helps visually impaired individuals immensely in keeping track of their cursor position.

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAPS+G</td>
<td>Speaks line number of the cursor</td>
</tr>
<tr>
<td>CAPS+H</td>
<td>Enables and disables cursor mode</td>
</tr>
<tr>
<td>CAPS+I</td>
<td>Speaks from current cursor position to end of line and “No further text” if text ends</td>
</tr>
<tr>
<td>CAPS+J</td>
<td>Speaks from immediate word at which the cursor is currently appearing to end of line</td>
</tr>
<tr>
<td>CAPS+K</td>
<td>Speaks from start of the line till cursor position</td>
</tr>
<tr>
<td>CAPS+L</td>
<td>Speaks complete line where the cursor is at.</td>
</tr>
<tr>
<td>CAPS+M</td>
<td>Speaks from immediate word to end of the document.</td>
</tr>
</tbody>
</table>

### 3.2. Debugging:

As debugging is vital for the creation of LaTeX documents, ALAP assists visually impaired individuals by providing following features:

- Comprehensive feedback upon compilation of the document
- Real time narration of compile and run time error
- Automatic cursor redirection to the start of erroneous line

#### 3.2.1. Shortcut Keys for Multiple Errors:

To help blind users debug in case of multiple errors, ALAP allows the traversal of the error list through the following shortcut keys.
CTRL+/ . to listen to the next error
CTRL+</, to listen to the previous error

3.3. Math Mode:

This feature enables the ability of descriptive narration of mathematical content. Math Mode enables
the capacity of TTS to read out mathematical equations like most humans do but with elaborative
keywords that makes it easier for visually impaired individuals to understand the structure of equation.
We’ve tried to cover all major sectors of mathematical equations namely fractions, summation,
integration, differentiation, binomial theorem, matrices, roots, set theory and logic notations.

Users can listen to the document in Math Mode by using shortcut key CAPS_LOCK + D.

For example, if your editor contains the following content:

```
\documentclass{article}
\begin{document}
\section{Title}
\subsection{Subtitle}
Plain text.
\subsection{Another subtitle}
More plain text.
$$\frac{1}{2}$$
$x^{2+i}$
\end{document}
```

The auditory feedback of Math Mode will be:

Title
Subtitle
Plain text.
Another subtitle
More plain text.
Fraction numerator 1 over denominator 2 end frac
X raise to power 2 + i end power

3.4. Accessible PDF:

This feature automates the process of accessible PDF generation for LaTeX based documents
with an extra focus on mechanical tagging of math equations. ALAP automatically extracts the
mathematical content in a LaTeX document and wraps it in appropriate alt text hence, reducing
the user overhead and ensuring uniformity. The purpose behind this feature is to enable the
correct narration of mathematical content by mainstream screen readers e.g. JAWS and NVDA,
because most of them skip mathematical symbols while narrating the PDF document. The
resultant narration of a tagged accessible PDF document with JAWS would sound exactly same to the auditory feedback of Math Mode in ALAP.

Accessible PDF can be enabled by using shortcut key CAPS_LOCK +A. If this feature is enabled, ALAP will alert the user of any violation of PDF accessibility standards as defined by WCAG 2.0.

### 3.5. Shortcut keys for Generic TTS Settings:

To further control TTS and modify its settings following shortcut keys are available.

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAPS+O</td>
<td>Turns ON TTS (ON by default)</td>
</tr>
<tr>
<td>CAPS+Q</td>
<td>Turns OFF TTS</td>
</tr>
<tr>
<td>CAPS+S</td>
<td>Narrates the document depending upon the verbosity level</td>
</tr>
<tr>
<td>CAPS+P</td>
<td>Pauses the TTS prompts</td>
</tr>
<tr>
<td>CAPS+R</td>
<td>Resumes the paused state of the TTS</td>
</tr>
<tr>
<td>CAPS+E</td>
<td>Sets the TTS in ready state even if it is in paused state</td>
</tr>
<tr>
<td>CAPS+W</td>
<td>Sets verbosity level of TTS to word</td>
</tr>
<tr>
<td>CAPS+C</td>
<td>Sets verbosity level of TTS by character</td>
</tr>
<tr>
<td>CAPS+=/+</td>
<td>Increase Speed of TTS</td>
</tr>
<tr>
<td>CAPS+-</td>
<td>Decrease Speed of TTS</td>
</tr>
</tbody>
</table>

### 3.6. Demo:

To find out more about ALAP and understand its key features & benefits, please visit the link below to see a fully detailed video of ALAP.

[https://www.youtube.com/watch?v=mnJZRsjcLQA&feature=youtu.be](https://www.youtube.com/watch?v=mnJZRsjcLQA&feature=youtu.be)