

Liii STEM: A Beginner's Guide

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Abstract

This is a short tutorial for Liii STEM. For full documentation, please refer to [Official documentation for Liii STEM](#). You can also contact us through the email yansong@liii.pro.

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Notations

-  represents the **Tab** key.
-  represents the **Option** key in MacOS.

Setup language

Before you start writing in Liii STEM, you need to setup the language for your document. This is because different languages have different format rule. The default language is based on the language of your system. You can change the language in the focus menu bar as shown in Figure 1.

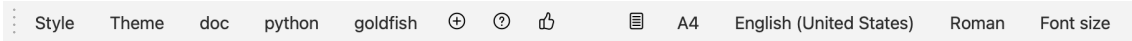


Figure 1. Change language

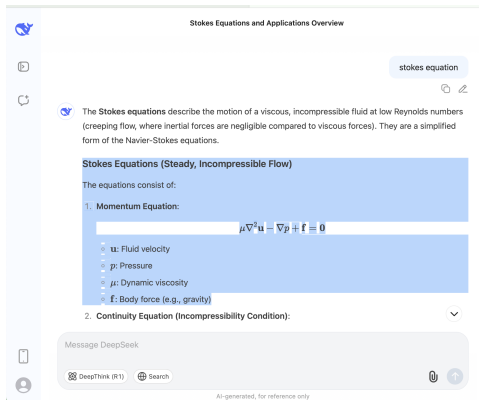
1 Magic paste

You can directly copy content from various large language models (LLM) into **Liii STEM**. Liii STEM automatically converts LLM-generated content (including code, formulas, tables, etc.) into Liii STEM format, ensuring the professionalism and consistency of document typesetting.

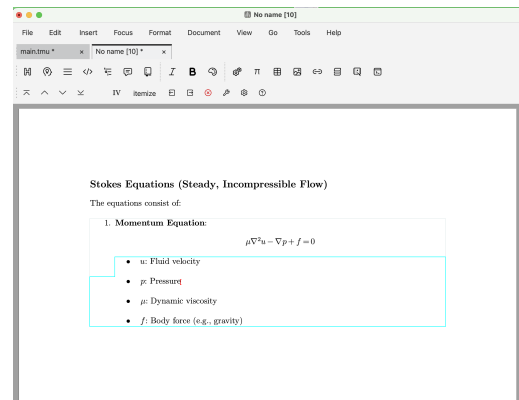
Instructions:

Step 1. Select the content you want to copy from an LLM (currently supports DeepSeek, Doubao) or from Zhihu, right click and copy (**Ctrl-C** for Windows or **Command-C** for MacOS).

Step 2. Paste directly into **Liii STEM** (**Ctrl-v** for Windows or **Command-v** for MacOS)



(a) select and copy from LLM



(b) paste directly into Liii STEM

Figure 1.1. Magic paste

Remark 1.1. Before magic pasting, ensure that the language of your document is consistent with the language used in the content generated by the LLM.

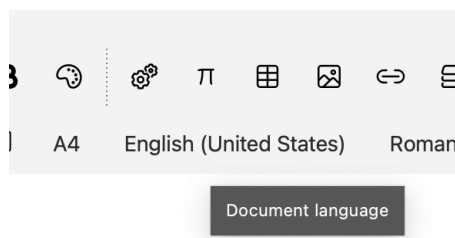


Figure. set the document language

2 Built-in AI Feature

Liii STEM supports various LLMs and vision language models (VLMs). The built-in LLMs and VLMs in **Liii STEM** can take not just plain text but also math, tables, structured environments, code and figures as prompts.

Instructions:

Step 1. Insert a Large Language Model session

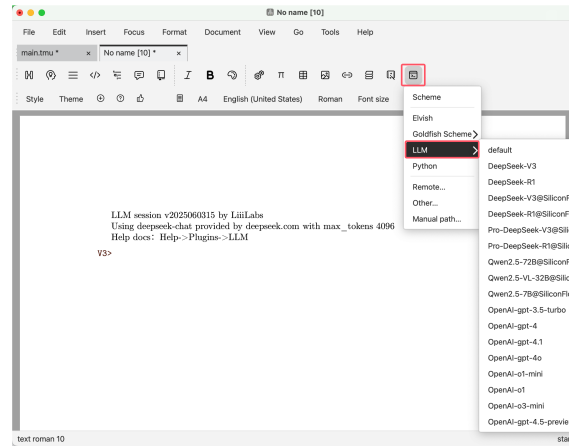


Figure 2.1. LLM session insertion

Step 2. Input prompt to the LLM. Use any rendered format as input for the LLM, or include figures when using a VLM. Press **Enter** to submit your prompt, and the LLM/VLM will return the output shortly.

Remark 2.1. If you want to input in next line instead of sending the prompt into LLMs, use **shift+Enter** instead.

Remark 2.2. To type mathematical expressions in LLM session, type **\$** and then **→** to go into the math mode (More discussions in Section 3).

Remark 2.3. In **Liii STEM**, the output generated by the integrated LLM/VLM can be rendered directly and is fully editable.

Remark 2.4. You must choose a model that supports VLM (with **VL** in its name) if your input includes figures.

Example 2.5. Click the **V3>** below to fold/unfold the output of LLMs (in Liii STEM)

LLM session v2025060315 by LiiLabs
Using Pro/deepseek-ai/DeepSeek-V3 provided by siliconflow.cn with max_tokens 4096
Help docs: Help->Plugins->LLM

V3> Please Calculate $\int_a^b e^x \log(x) dx$ for me

V3>

3 Mathematical expressions

In **Liii STEM**, you must type mathematical expressions in **math environments/modes**. You can goto **math modes** using the **\$** key. All features described in this section are based on the math environment. Figure 3.1 shows the **mode toolbar** & **focus toolbar** for each environment.

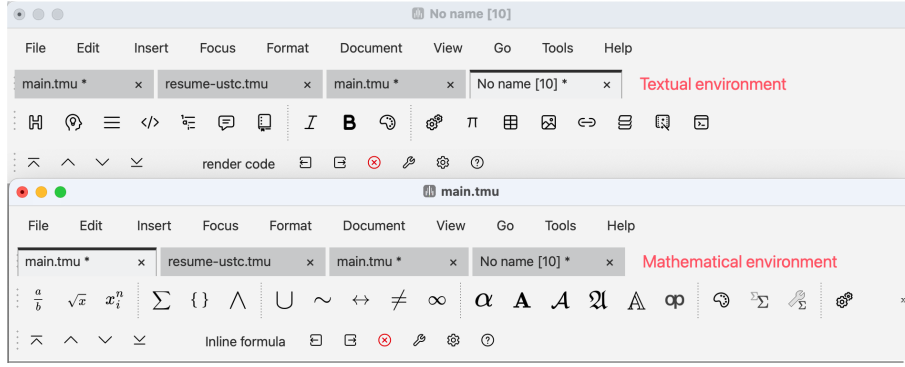


Figure 3.1. textual environment and mathematical environment

3.1 Inserting Mathematical expressions

1. Inline formula

Example. This is an inline formula $\alpha \neq \beta$.

- **Method 1:** Navigate on the menu: **Insert->Mathematics->Inline formula**
- **Method 2:** Use the keyboard shortcut **\$** (For LLM sessions: use **\$+→**).

2. Displayed formula

Example. The following is a displayed formula:

$$\alpha \neq \beta$$

- **Method 1:** Navigate on the toolbar: **Insert->Mathematics->Displayed formula**
- **Method 2:** Use the shortcut **Alt-\$** (Windows/Linux) or **⌘-\$** (MacOS)

3. Aligned formula (multi-line equations)

Example 3.1. The following is an aligned formula:

$$\begin{aligned} f(x) &\leq \|\alpha + \beta\| \\ &\leq \|\alpha + \gamma\| + \|\gamma + \beta\|. \end{aligned}$$

- **Method 1:** Type **\align** and press **Enter**
- **Method 2:** Type **\eqnarray** and press **Enter** or use the keyboard shortcut **Alt-Shift-7** (Windows/Linux) or **⌘-Shift-7** (MacOS)
- **Method 3:** Navigate on the toolbar: **Insert->Mathematics->Several equations**

Typing mathematics in **Liiv STEM** is extremely faster than in $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ and MS Word. This is done by

- Lego Symbol.
- Tab Cycling.

3.2 Lego Symbol

In **Liii STEM**, you can type math symbols like crafting Lego! For example:

- \leftarrow and \rightarrow represent directions.
- \Rightarrow and \Leftarrow represent directions.
- ∞ represent a circle.

By combining these, you can derive dozens of commonly used symbols. Table 3.1 provides more examples:

Symbol	Liii STEM Lego Symbol	L ^A T _E X Code
\rightarrow	$\leftarrow + \rightarrow$	Latex <code>\rightarrow</code>
\nrightarrow	$\Rightarrow + \rightarrow + /$	Latex <code>\nrightarrow</code>
∞	$\circ + \circ$	Latex <code>\infty</code>
\mathbb{R}	$\circ R + \circ R$	Latex <code>\mathbb{R}</code>
$\dot{=}$	$\cdot + =$	Latex <code>\doteq</code>
...

Table 3.1. Lego Symbols

3.3 Tab Cycling

In **Liii STEM**, you can cycle through visually similar symbols or Greek letters by pressing **Tab**, and reverse the cycle with **Shift-Tab**.

For example, the `\forall` symbol \forall resembles an upside-down “A”, simply type A and press **Tab** twice to insert it.

More effect is demonstrated below:

Symbol	Liii STEM Tab Cycling	L ^A T _E X Code
\angle	$\leftarrow + \text{shift} + \text{Tab}$	Latex <code>\leangle</code>
\sqsubset	$\leftarrow + \text{Tab Tab Tab Tab}$	Latex <code>\sqsubset</code>
\in	$\leftarrow + \text{Tab}$	Latex <code>\in</code>
α	$A + \text{Tab}$	Latex <code>\alpha</code>
ε	$E + \text{Tab}$	Latex <code>\varepsilon</code>
\forall	$\circ A + \text{Tab Tab}$	Latex <code>\forall</code>
\exists	$\circ E + \text{Tab Tab}$	Latex <code>\exists</code>
...

Table 3.2. Tab Cycling Symbols

Remark 3.2. You can combine Lego Symbol and Tab Cycling. For example, \leq with \rightarrow has several variant, \leqslant , \leqslant , and \leqslant .

Remark 3.3. More details about these two symbol system and a **detail cheatsheet** are available in [How to edit mathematics in Liii STEM](#).

Remark 3.4. Liii STEM also supports L^AT_EX command! If you are familiar with L^AT_EX (though I highly recommend our shortcuts.), you can still use them.

4 Section, subsections

You can use **Alt+1** to insert a section and **Alt+2** to insert a subsection.

Remark 4.1. For subsubsection, use **Alt+3**. In MacOS, use **⌘** instead of **Alt**.

Remark 4.2. You can also insert sections through GUI

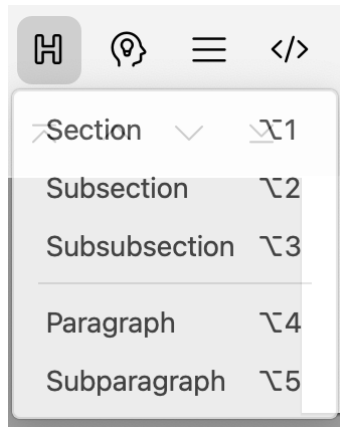


Figure. Insert sections through GUI.

Remark 4.3. Section is also an environment/mode. Therefore, the Focus/Mode toolbar will be different from textual mode. Use arrow key (or your mouse) to enter/quit the section environments.

5 Enunciations (Theorem, Definition, ...)

You can insert enunciations through GUI (as shown in Figure 5.1) or by typing `\ENUN-NAME` with `ENUN-NAME` be replaced by the enunciation name such as theorem, definition, proof, example, ...

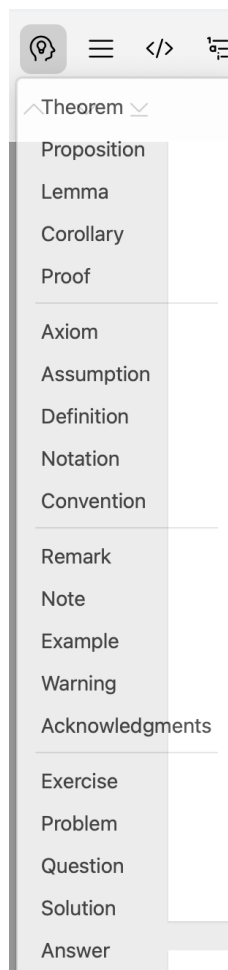


Figure 5.1. Insert Enunciations through GUI.

Remark 5.1. All enunciations are environments/modes. Therefore, the Focus/Mode toolbar will be different from textual mode. Use arrow key (or your mouse) to enter/quit the enunciation environments.

6 Figure Insertion

Instructions:

Step 1. Insert the image.

1. Navigate on the toolbar: **Insert → Image → Small Image**. And then you can see an empty figure highlighted with a blue box on the page.

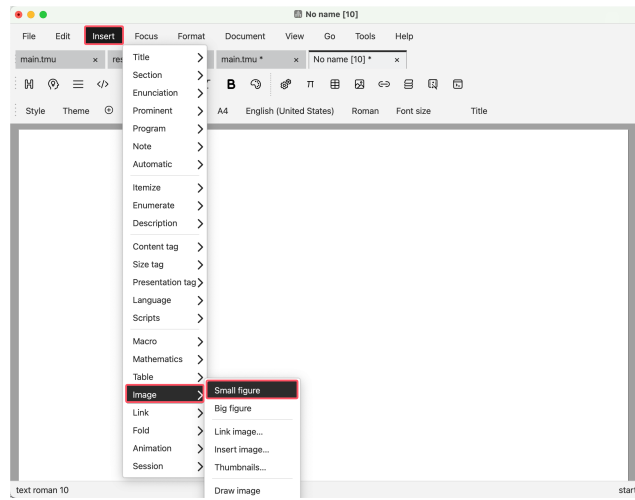


Figure 6.1. figure insertion

2. Paste your image into the blue highlighted area **Ctrl-V**/**Cmd-V**.

Step 2. Label the image.

1. Position cursor at the end of the image caption.
2. Type `\label` (or use shortcut: **Ctrl-!** or **Cmd-!**), then press **Enter**.
3. Enter your image label (e.g., "Figure1"), press **Enter**.

However, the numerical experiment suggests that condition-(15) given in Theorem-1 may not be necessary for convergence, as shown in Figure-1. when $\epsilon = 0.1$ and 0.2 .

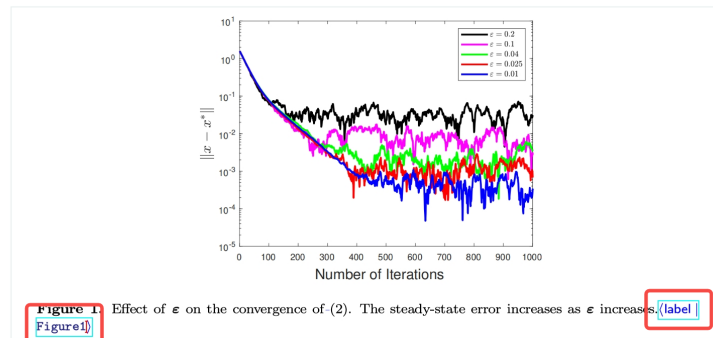


Figure 6.2. figure labeling

Step 3. Create cross-reference to the image at desired location where you want to reference the figure.

1. Type `\ref`, press **Enter**.
2. Enter your previously defined label (e.g., "Figure1"), press **Enter**.

However, the numerical experiment suggests that condition (15) given in Theorem-1 may not be necessary for convergence, as shown in Figure `\ref{Figure1}`, when $\epsilon = 0.1$ and 0.2 .

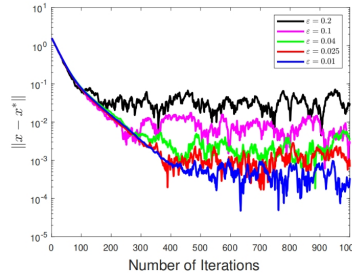


Figure 1. Effect of ϵ on the convergence of (2). The steady-state error increases as ϵ increases.

Figure 6.3. figure cross-referencing

Remark 6.1. You can insert a non-breaking-space between the "Figure" text and reference number by **Space-Tab**.

A Table Insertion

Instructions:

Step 1. Insert the table.

1. Navigate on the toolbar: **Insert** → **Table** → **Small Table**. And then you can see an empty table highlighted with a blue box on the page.

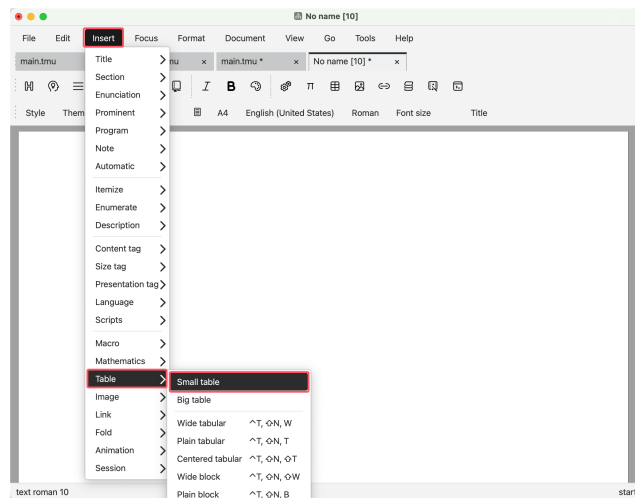


Figure A.1. table insertion

2. Edit the table.

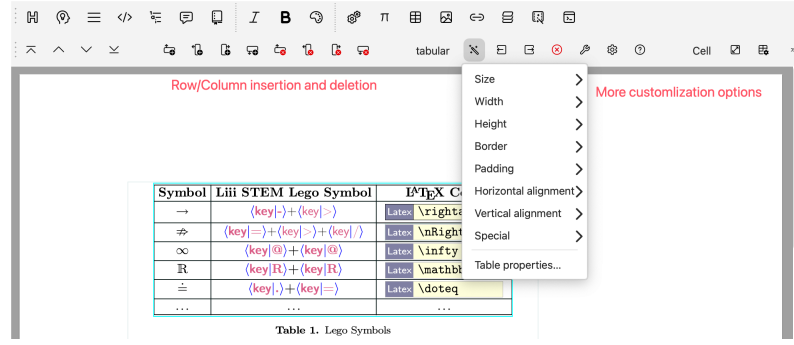


Figure A.2. table editing

Remark A.1. You can label and cross-ref the table follow the same step as discussed in Section 6

Remark A.2. You can insert a non-breaking-space between the "Table" text and reference number by **Space-Tab**.

Remark A.3. You can customize the borders of the table by clicking "Change border of the cell" button on tool bar.

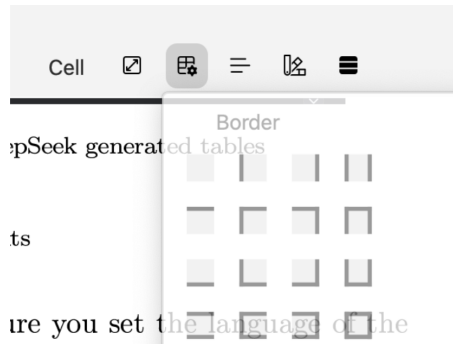


Figure. borders can be customized

Remark A.4. Some buttons may be hidden due to limited space on the toolbar. Try stretching the window to reveal them.

B Bibliography Insertion

This feature provides automatic recognition, generation, and typesetting for BibTeX bibliographies

Instructions:

Step 1. Download BibTeX file.

Search for your target literature on academic platforms, navigate to the publication details page, and download BibTeX file or manually copy the BibTeX text. For multiple references, you can save all BibTeX entries in a single **.bib** file.

Step 2. Import BibTeX file.

1. Launch **Liii STEM**, then navigate on the toolbar: **Insert** → **Automatic** → **Bibliography**.

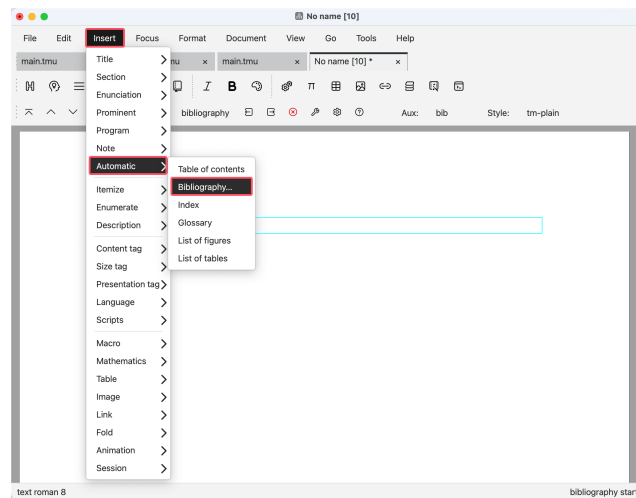


Figure B.1. bibliography insertion

2. Select and open your locally saved **.bib** file. And then you can see the word “References” highlighted with a blue box on the page.

Step 3. Insert literature and citation

Type `\cite`, and press **Enter**, then paste the reference key from your **.bib** file (as shown below).

For multiple references click the structured insert button on the toolbar, then input the next reference key. Repeat until all keys are added, then press **Enter**.

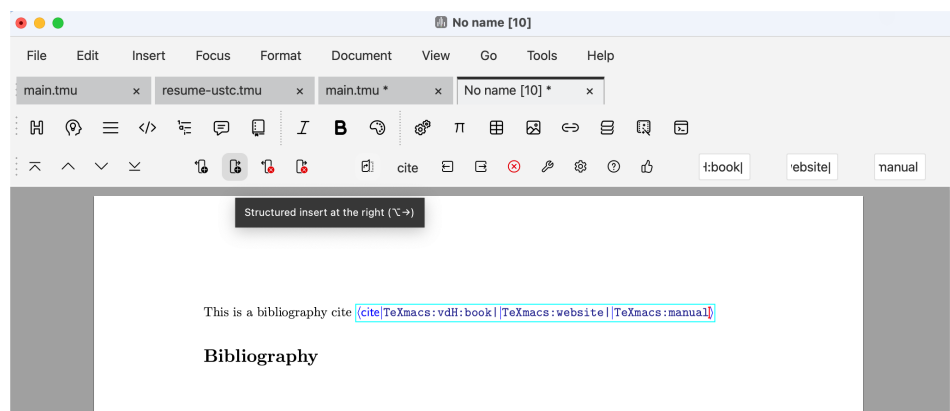


Figure B.2. citation insertion

Step 3. Generate bibliography

Navigate on the toolbar: **Document** → **Update** → **All**, or use keyboard shortcut **Shift-Ctrl-R** (or **Shift-Cmd-R** in MacOS). Wait 1–5 seconds for the system to automatically generate the bibliography list.

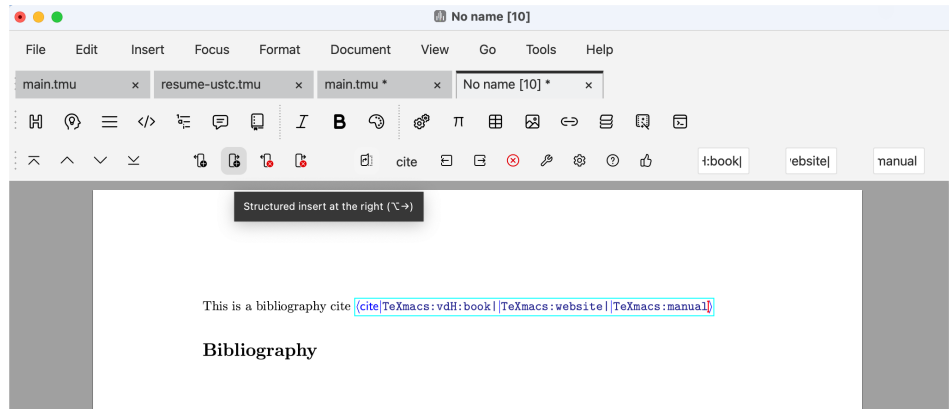


Figure B.3. bibliography generation

C Code Insertion

C.1 Pseudocode

You can put your pseudocode by navigating on the toolbar `insert->program->pseudocode`. For example:

```
GENETIC_ALGORITHM:
  Initialize a population of chromosomes (solutions)
  Evaluate the fitness of each chromosome

  WHILE (termination_condition_not_met):
    SELECT parent chromosomes from the population (Selection)
    APPLY crossover operator to create offspring
    APPLY mutation operator to offspring
    EVALUATE the fitness of offspring
    SELECT individuals for the next generation (Survivor Selection)

  RETURN the best chromosome found
```

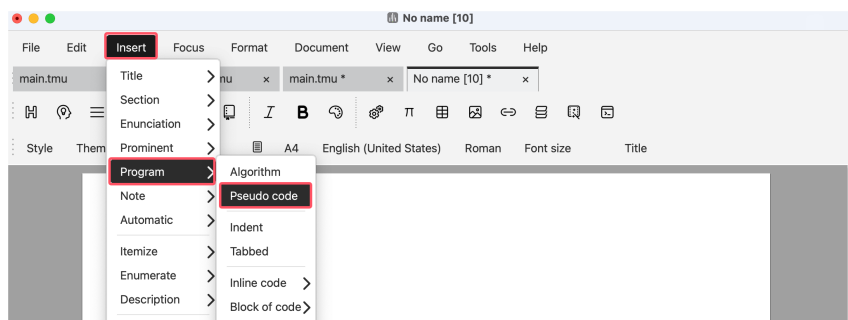


Figure C.1. pseudocode block insertion

You can also insert real-codes such as python

```
import numpy as np
np.ones([3,1])
```

C.2 Running Code

Codes can be evaluated through read-eval-print-loop (REPL) in Lii STEM. Currently we support Goldfish Scheme and Python language.

Instructions:

Step 1. Insert an interactive code session.

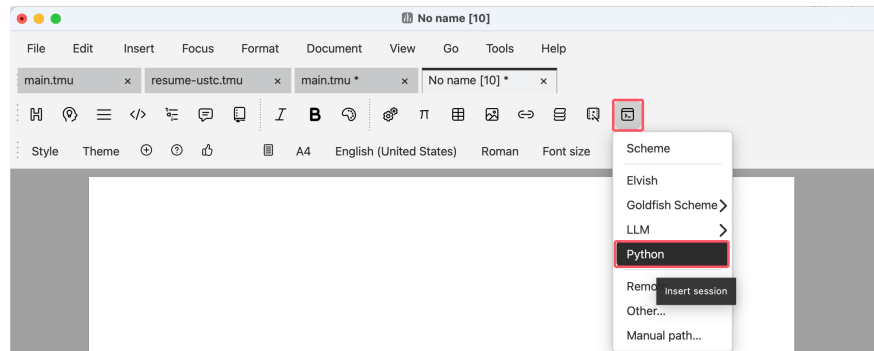


Figure C.2. code session insertion

Step 2. Input code and evaluate by pressing **Enter**. For multi-line code use **Shift Enter** to insert a new line.

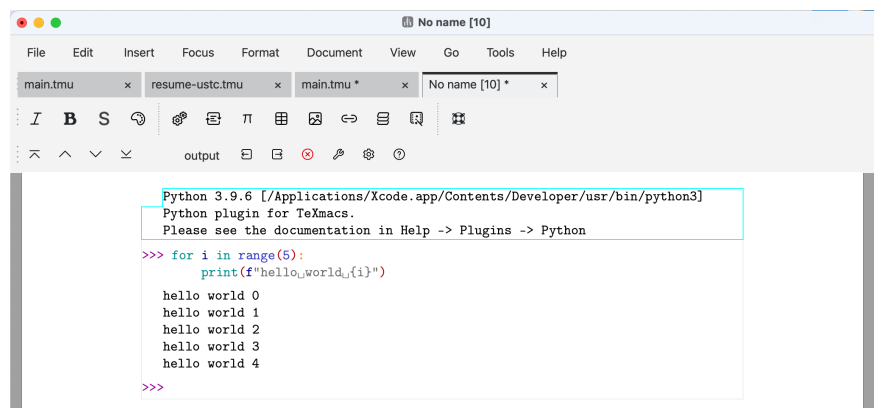


Figure C.3. code session evaluation

Remark C.1. To run Python code inside **Lii STEM**, a Python interpreter must be installed on your machine.

C.3 Plotting

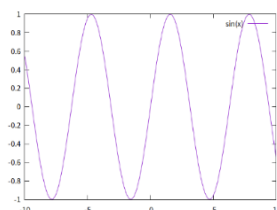
For Figure Plotting, check the template provided in our website: <https://liiitem.cn/template/gnu-plot-cartesion.html>.

本模板的目的是方便大家使用Gnuplot绘制常用的平面直角坐标系的曲线:

绘制 $\sin(x)$

```
png] % -width 0.27par
```

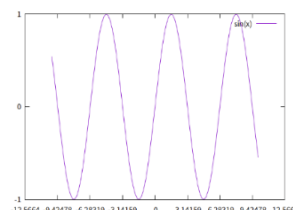
```
plot sin(x)
```



设定横轴和纵轴的刻度

```
png] % -width 0.27par
```

```
set xtics pi; set ytics 1
plot sin(x)
```



设定横轴的范围

```
png] % -width 0.27par
```

```
set xtics pi; set ytics 1
plot [-pi:pi] sin(x)
```

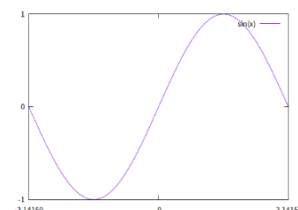


Figure. Plotting with Gnuplot