

CONVERTING MAPLE CODE INTO L^AT_EX CODE

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Maple can convert commands into LaTeX code fairly easily. The advantage to this is that the code needs only to be typed once. If you are already typing in Maple to do calculations, the amount of work to convert the calculations into LaTeX is minimal.

Use the command *latex*(*), where * is the regular Maple code. Maple's output can be copied into the WinEdt file.

For example:

The Maple command: *latex* (a² + b² = c²);

returns: {a} ^ {2} + {b} ^ {2} = {c} ^ {2}

which can be copied and placed within \$'s in WinEdt. The final result in the PDF file will appear as: $a^2 + b^2 = c^2$

Sometimes what Maple returns is not the best possible output.

For example:

The Maple command: *latex* (Int(sin(x), x = 0 .. Pi/4));

will produce: $\int_0^{1/4\pi} \sin(x) dx$

whereas: $\int_0^{\pi/4} \sin(x) dx$ would have been a clearer output.

Matrices in Maple can also be converted into LaTeX after loading the Linear-Algebra package in Maple. Consider the Maple commands and the associated LaTeX output below.

Column Vector:

$$\textit{latex}(\text{Vector}([4, 5, 6]));$$
$$\begin{bmatrix} 4 \\ 5 \\ 6 \end{bmatrix}$$

Row Vector:

$$\textit{latex}(\text{Vector}[\text{row}]([1, 2, 3]));$$
$$\begin{bmatrix} 1 & 2 & 3 \end{bmatrix}$$

Matrix:

$$\textit{latex}(\text{Matrix}([[1, 2, 3], [4, 5, 6], [7, 8, 9]]));$$
$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

Entire Maple documents can be converted into a LaTeX file. This is accomplished by clicking File, Export As... in Maple. When prompted, save the file as a .tex file. After the conversion, the file can be opened in WinEdt and edited. This process requires the maple2e package in WinEdt.

The conversion may not be perfect; edits may be needed to make the final document more readable, but this is certainly easier than re-typing the entire document.

Below is an example of converting an entire Maple document into a LaTeX file.

Maple Input:

```
restart;
Paths:=  $\frac{2^k}{c+1} + \frac{2^{k+1}}{c+1} \sum \left( \left( \cos \left( \frac{Pi \cdot j}{c+1} \right) \right)^k \cos \left( \frac{k \cdot Pi \cdot j}{c+1} - \frac{2 \cdot Pi \cdot \text{floor} \left( \frac{k+i+1}{2} \right)}{c+1} \right), j = 1.. \text{floor} \left( \frac{c}{2} \right) \right);$ 
k:=15;
c:=6;
for i from 0 to c do Number of paths terminating at (k, i) = simplify(Paths)
end do;
```

Once the commands have been executed and the file converted into a .tex file, the document as printed by LaTeX was as follows:

$$\frac{2^k}{c+1} + 2^{k+1} \sum_{j=1}^{\text{floor}(1/2 c)} \left(\cos \left(\frac{\pi j}{c+1} \right) \right)^k \cos \left(\frac{k\pi j}{c+1} - 2 \frac{\pi j \text{floor}(1/2 k + 1/2 i + 1/2)}{c+1} \right) (c+1)^{-1}$$

15

6

Number of paths terminating at150 = 6451

Number of paths terminating at151 = 6451

Number of paths terminating at152 = 5110

Number of paths terminating at153 = 5110

Number of paths terminating at154 = 3458

Number of paths terminating at155 = 3458

Number of paths terminating at156 = 2730

This output has a few flaws that would need to be edited:

- The conversion has transformed all fractions into the form x/y . The form $\frac{x}{y}$ would look better and be easier to read.
- What was intended to be the denominator in the second term was added to the end of the term as $(c + 1)^{-1}$.
- LaTeX does not recognize the floor (greatest integer) function and the appropriate brackets who need to be added by the author.
- The parentheses surrounding a point are missing, as is the comma. The final statements should read:

Number of paths terminating at $(15, 0) = 6451$

\vdots

The end result of converting a Maple worksheet into a LaTeX file is not perfect. However, the amount of time saved by not re-typing the code is much greater than the time needed to go through the LaTeX document and fix the minor details.