

L^AT_EX Example #1

Jeremy Pedersen

2023-01-03

1 First section

We can use the listing package to place source code into our documents from a file:

```
1 #
2 # A Rangoli Generator
3 #
4 # Author: Jeremy Pedersen
5 # Date: 2019-02-18
6 # License: "the unlicense" (Google it)
7 #
8
9 # Define letters for use in rangoli
10 alphabet = 'a b c d e f g h i j k l m n o p q r s t u v w x y z'.split()
11
12 # Read in rangoli size
13 size = int(input("Set size of rangoli: "))
14
15 # Calculate maximum linewidth (how much fill do we need per line)
16 maxWidth = size*2 - 1 + (size - 1)*2
17
18 # Generate rangoli
19 for i in list(range(size-1,0,-1)) + list(range(0,size)):
20     left = alphabet[1+i:size]
21     left.reverse()
22     right = alphabet[0+i:size]
23
24     center = '-'.join(left + right)
25
26     padding = '-'*((maxWidth - len(center))//2)
27
28     print(padding+center+padding)
29
```

test_code.py

Or we can quote a range of line numbers from the file (lines 19 and 20, for example):

```
1 for i in list(range(size-1,0,-1)) + list(range(0,size)):
2     left = alphabet[1+i:size]
```

test_code.py

We can also place code directly into latex without importing it from a file:

```
print("Hi, I'm Python 3!")
```

1.1 First subsection

We can create and format mathematical expressions like so:

$$\begin{aligned}x' &= x \cdot \text{scos}\theta - y \cdot \text{ssin}\theta + t_x \\y' &= x \cdot \text{ssin}\theta + y \cdot \text{scos}\theta + t_y\end{aligned}$$

We can also make a nice list:

1. I am the first thing in the list
2. I am the second thing in the list

We can inline mathematical expressions such as this one " $4\sigma_0$ " using the "\$" sign. We can make mathematical expressions that occupy their own line, like this:

$$u = (x - x_0) \frac{1}{4\sigma_0} \cos\theta_0 - (y - y_0) \frac{1}{4\sigma_0} \sin\theta_0 + 4 = (0 - 16) \frac{1}{4} - 0 + 4$$

1.2 Second subsection

We can also make tables and charts using the array type like so:

$$\phi = \left\{ \begin{array}{ll} \theta_0 + \theta_{pt} & \text{if } \theta_0 + \theta_{pt} \in [0, 2\pi) \\ \theta_0 + \theta_{pt} + 2\pi & \text{if } \theta_0 + \theta_{pt} < 0 \\ \theta_0 + \theta_{pt} - 2\pi & \text{if } \theta_0 + \theta_{pt} \geq 2\pi \end{array} \right\}$$

I can start an enumerated list of items here...

1. One thing
2. Another thing

And then...

2 Second section

...I can continue it here!

3. Yet more stuff
4. Some other things

Inserting figures is also relatively easy to do:



Figure 1: I can embed images too

We can make a table with centered elements:

$$\begin{bmatrix} 1.1754 & -0.8334 & 193.4191 \\ 0.2062 & 1.0380 & -141.0333 \\ -0.0008 & 0.0007 & 1.0000 \end{bmatrix}$$

There you go! That should be enough to get you started on LaTeX!