

test

January 10, 2025

## 1 nbconvert latex test

**Lorem ipsum** dolor sit amet, consectetur adipiscing elit. Nunc luctus bibendum felis dictum sodales. Ut suscipit, orci ut interdum imperdiet, purus ligula mollis *justo*, non malesuada nisl augue eget lorem. Donec bibendum, erat sit amet porttitor aliquam, urna lorem ornare libero, in vehicula diam diam ut ante. Nam non urna rhoncus, accumsan elit sit amet, mollis tellus. Vestibulum nec tellus metus. Vestibulum tempor, ligula et vehicula rhoncus, sapien turpis faucibus lorem, id dapibus turpis mauris ac orci. Sed volutpat vestibulum venenatis.

L<sup>A</sup>T<sub>E</sub>X T<sub>E</sub>X

This is a test list:

1. item 1
  - subitem 1
  - subitem 2
2. item 2
3. item 3

### 1.1 Printed Using Python

```
[1]: next_paragraph = """
Aenean vitae diam consectetur, tempus arcu quis, ultricies urna. Vivamus
    ↪venenatis sem
quis orci condimentum, sed feugiat dui porta.
"""

def identity_dec(ob):
    return ob

@identity_dec
def nifty_print(text):
    """Used to test syntax highlighting"""

    print(text * 2)

nifty_print(next_paragraph)
```

Aenean vitae diam consectetur, tempus arcu quis, ultricies urna. Vivamus

```
venenatis sem  
quis orci condimentum, sed feugiat dui porta.
```

```
Aenean vitae diam consectetur, tempus arcu quis, ultricies urna. Vivamus  
venenatis sem  
quis orci condimentum, sed feugiat dui porta.
```

## 1.2 Pyout (and Text Wrapping)

```
[2]: Text = """  
Aliquam blandit aliquet enim, eget scelerisque eros adipiscing quis. Nunc sed  
    ↪metus  
ut lorem condimentum condimentum nec id enim. Sed malesuada cursus hendrerit.  
    ↪Praesent  
et commodo justo. Interdum et malesuada fames ac ante ipsum primis in faucibus.  
Curabitur et magna ante. Proin luctus tellus sit amet egestas laoreet. Sed  
    ↪dapibus  
neque ac nulla mollis cursus. Fusce mollis egestas libero mattis facilisis.  
"""  
Text #Use print(Text) instead to get text wrapping in pdf
```

```
[2]: '\nAliquam blandit aliquet enim, eget scelerisque eros adipiscing quis. Nunc sed  
metus \nut lorem condimentum condimentum nec id enim. Sed malesuada cursus  
hendrerit. Praesent \net commodo justo. Interdum et malesuada fames ac ante  
ipsum primis in faucibus. \nCurabitur et magna ante. Proin luctus tellus sit  
amet egestas laoreet. Sed dapibus \nneque ac nulla mollis cursus. Fusce mollis  
egestas libero mattis facilisis.\n'
```

```
[3]: print(Text)
```

```
Aliquam blandit aliquet enim, eget scelerisque eros adipiscing quis. Nunc sed  
metus  
ut lorem condimentum condimentum nec id enim. Sed malesuada cursus hendrerit.  
Praesent  
et commodo justo. Interdum et malesuada fames ac ante ipsum primis in faucibus.  
Curabitur et magna ante. Proin luctus tellus sit amet egestas laoreet. Sed  
dapibus  
neque ac nulla mollis cursus. Fusce mollis egestas libero mattis facilisis.
```

```
[4]: import numpy as np  
  
a = np.random.rand(10,10)  
print(a)  
a
```

```
[0.28568166 0.8747998 0.87645362 0.51011938 0.06167899 0.6253242
 0.21695898 0.35406203 0.76399062 0.38721428]
[0.59226394 0.23033422 0.11576507 0.0131951 0.34366223 0.96629731
 0.2867491 0.95194302 0.60324146 0.55986092]
[0.36955543 0.78864789 0.73933855 0.39474922 0.74616752 0.9144543
 0.88600249 0.42611302 0.49375306 0.4260594 ]
[0.40550295 0.85035162 0.5525894 0.21827199 0.67949174 0.93909704
 0.0331135 0.27240638 0.39332899 0.19852766]
[0.32876315 0.97305405 0.11060386 0.20685979 0.3897287 0.01538051
 0.44747911 0.99865014 0.89374066 0.5141975 ]
[0.10450336 0.42284722 0.95628045 0.32792639 0.11370905 0.32150692
 0.28631773 0.58203321 0.21240863 0.87954985]
[0.62257223 0.79092658 0.72718477 0.0039627 0.61581427 0.28007586
 0.4653752 0.24737437 0.97801711 0.31160009]
[0.03592867 0.56885907 0.05229575 0.12322391 0.45236765 0.98892923
 0.15013782 0.81404334 0.71795481 0.60145161]
[0.01582381 0.23420526 0.18574213 0.6497537 0.71730148 0.0068443
 0.32733317 0.81837686 0.58895758 0.37633478]
[0.64226276 0.77550803 0.23729951 0.9287232 0.14250076 0.23955818
 0.70490581 0.84959453 0.46939408 0.01230405]]
```

```
[4]: array([[0.28568166, 0.8747998 , 0.87645362, 0.51011938, 0.06167899,
 0.6253242 , 0.21695898, 0.35406203, 0.76399062, 0.38721428],
 [0.59226394, 0.23033422, 0.11576507, 0.0131951 , 0.34366223,
 0.96629731, 0.2867491 , 0.95194302, 0.60324146, 0.55986092],
 [0.36955543, 0.78864789, 0.73933855, 0.39474922, 0.74616752,
 0.9144543 , 0.88600249, 0.42611302, 0.49375306, 0.4260594 ],
 [0.40550295, 0.85035162, 0.5525894 , 0.21827199, 0.67949174,
 0.93909704, 0.0331135 , 0.27240638, 0.39332899, 0.19852766],
 [0.32876315, 0.97305405, 0.11060386, 0.20685979, 0.3897287 ,
 0.01538051, 0.44747911, 0.99865014, 0.89374066, 0.5141975 ],
 [0.10450336, 0.42284722, 0.95628045, 0.32792639, 0.11370905,
 0.32150692, 0.28631773, 0.58203321, 0.21240863, 0.87954985],
 [0.62257223, 0.79092658, 0.72718477, 0.0039627 , 0.61581427,
 0.28007586, 0.4653752 , 0.24737437, 0.97801711, 0.31160009],
 [0.03592867, 0.56885907, 0.05229575, 0.12322391, 0.45236765,
 0.98892923, 0.15013782, 0.81404334, 0.71795481, 0.60145161],
 [0.01582381, 0.23420526, 0.18574213, 0.6497537 , 0.71730148,
 0.0068443 , 0.32733317, 0.81837686, 0.58895758, 0.37633478],
 [0.64226276, 0.77550803, 0.23729951, 0.9287232 , 0.14250076,
 0.23955818, 0.70490581, 0.84959453, 0.46939408, 0.01230405]])
```

### 1.2.1 Image

```
[5]: from IPython.core.display import Image
Image(data="http://ipython.org/_static/IPy_header.png")
```

```
[5]:
```

# IP[y]: IPython

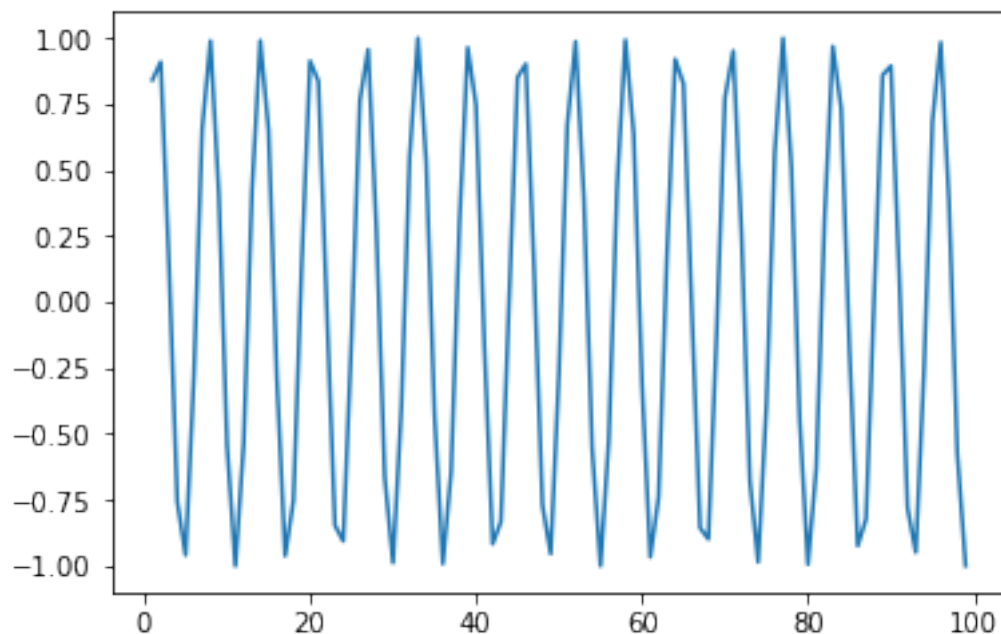
## Interactive Computing

```
[1231]: print('text')
```

text

```
[7]: %matplotlib inline
import matplotlib.pyplot as plt
import numpy as np
```

```
[8]: x = np.arange(1,100)
y = np.sin(x)
plt.plot(x,y)
plt.show()
```



### 1.2.2 Operator Highlighting Check

```
[9]: #This is a comment with an operation x @ y in it.
test = 5**9 + 2 - x@ y / (7 % 2) + True * 7
print(test)
```

```
a = set([1,2,3,4,5,6,7,8,9,0])
b = set([2,4,6,8,0])
a & b
```

1953188.1556827284

[9]: {0, 2, 4, 6, 8}

**Pandas Output** Here we test the output of **Pandas**

First a *markdown* table:

Column 1	Column 2
1	3
a	b
4	&

**Pandas**

```
[10]: import pandas as pd
pd.DataFrame(np.random.randn(10,3))
```

```
[10]:      0      1      2
0 -1.565342 -0.260043 -1.427162
1 -0.267812  1.022688 -0.268030
2  0.104852  0.415075  0.958796
3  0.210758 -0.500437 -1.584460
4 -0.754263 -2.317940 -0.384726
5 -0.062044 -0.804551  0.914101
6 -2.193517  2.356933  0.542824
7 -1.246683  0.981807 -0.216905
8 -0.784741 -0.647911  0.134776
9  0.008086  1.652312 -0.468785
```

**Sympy output**

```
[11]: import sympy
from sympy.abc import x, n, m
sympy.init_printing()
theta = sympy.Symbol('theta')
phi = sympy.Symbol('phi')

sympy.simplify(sympy.Ynm(n,m,theta,phi).expand(func=True))
```

[11]:

$$\frac{P_n^{(m)}(\cos(\theta))}{2\sqrt{\pi}} \sqrt{\frac{(-m+n)!}{(m+n)!}} (2n+1)e^{im\phi}$$

x + y as plain text.

$$\frac{P_n^{(m)}(\cos(\theta))}{2\sqrt{\pi}}\sqrt{\frac{(-m+n)!}{(m+n)!}}(2n+1)e^{im\phi}$$

**Line Length**

```
[ ]: 1 3 5 7 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60 63 66 69 72 75 78␣
      ↪81 84 87 90 93 96 99 103
```