[21]:
```
import numpy as np
import pickle
import time
from ipywidgets import interact
from bokeh.io import push_notebook, save
from bokeh.plotting import figure, output_file, show, output_notebook
output_notebook()
```

[22]:
```
ra1 = np.random.rand(2,2)
ra2 = np.array([1,2])
ray = np.dot(ra1,ra2)
xc = [0,ray[0]]
yc = [0,ray[1]]

print("X-{}: Y-{}".format(xc,yc))
```

```
X-[0, 2.2506049183595893]: Y-[0, 2.2578898223628294]
```

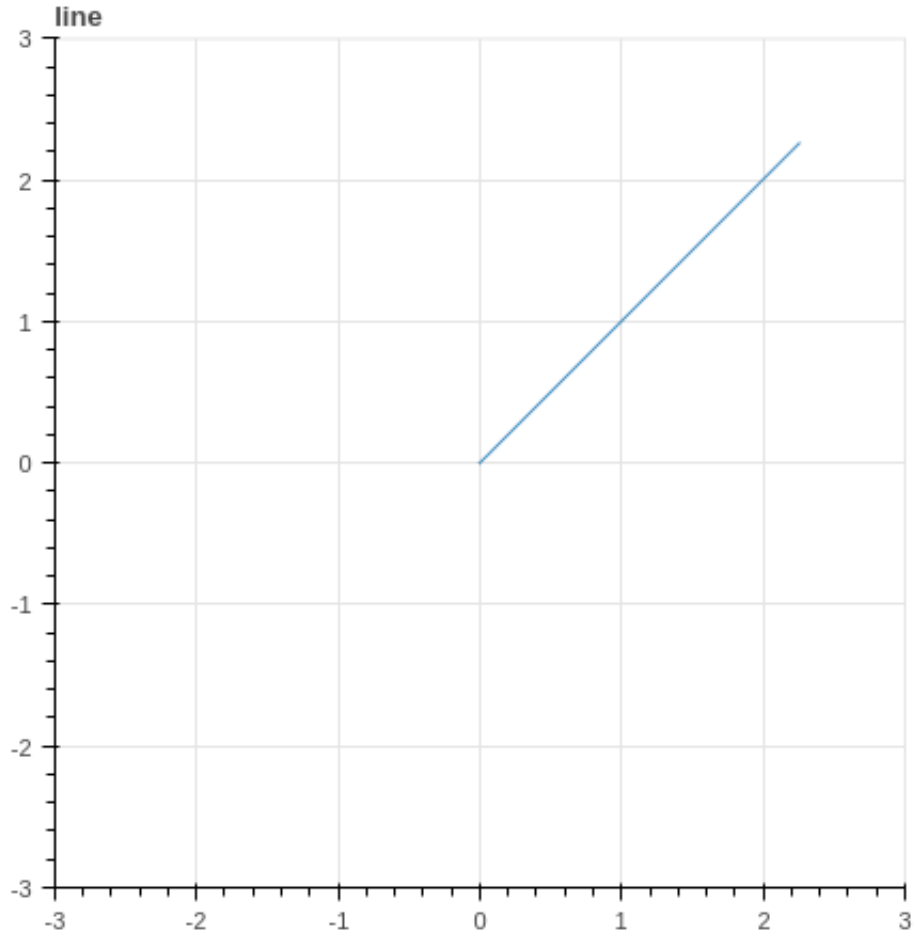
[23]:
```
p = figure(title="line", plot_width=450, plot_height=450, y_range=[-3.0,3.
r = p.line(xc,yc)

def update():
    ra1 = np.random.rand(2,2)
    ra2 = np.array([1,2])
    ray = np.dot(ra1,ra2)
    xc = [0,ray[0]]
    yc = [0,ray[1]]
    r.data_source.data['y'] = yc
    r.data_source.data['x'] = xc
    push_notebook()

show(p, notebook_handle=True)
```

```
<bokeh.io._CommsHandle at 0x7f65c0fcb588>
```

[19]:
```
for i in range(2):
    time.sleep(0.5)
    save(obj=p, filename='saved'+str(i))
    update()
```

```
/home/tetta/anaconda3/envs/lamedoc/lib/python3.5/site-packages/bokeh/io.py:433:
  warnings.warn("save() called but no resources were supplied and output_file(..
/home/tetta/anaconda3/envs/lamedoc/lib/python3.5/site-packages/bokeh/io.py:443:
  warnings.warn("save() called but no title was supplied and output_file(...) wa
```

Picture



Picture1. Vector space.

Very well defined

[ ]: