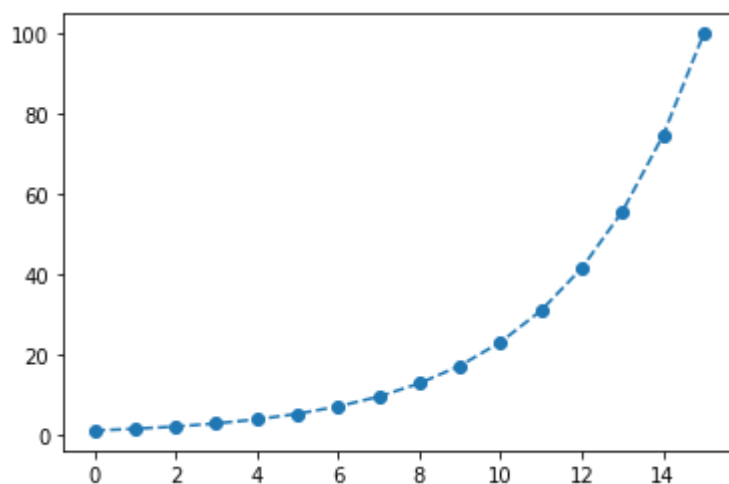


In [3]:

```
# Data Visualization using Matplotlib.  
# You can compute and visualize values in the Logspace as follows:
```

```
import numpy as np  
import matplotlib.pyplot as plt  
N = 16  
x = np.linspace(0, 15, N)  
y = np.logspace(0.1, 2, N)  
print(y)  
plt.plot(x, y, 'o--')  
plt.show()
```

```
[ 1.25892541  1.68525904  2.25597007  3.01995172  4.04265487  
 5.41169527  7.2443596   9.69765359 12.98175275 17.37800829  
23.26305067 31.14105584 41.68693835 55.80417175 74.70218989  
100.]
```



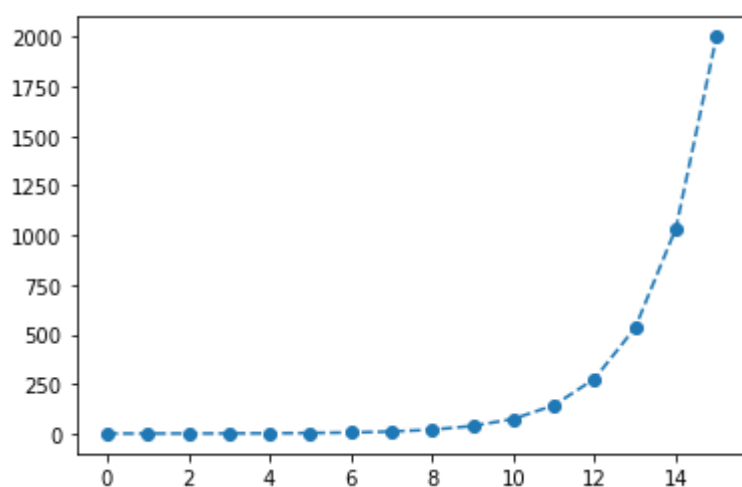
In [4]:



```
# You can even compute a series in the geometric progression as follows:
```

```
import numpy as np
import matplotlib.pyplot as plt
N = 16
x = np.linspace(0, 15, N)
y = np.geomspace(0.1, 2000, N)
print(y)
plt.plot(x, y, 'o--')
plt.show()
```

```
[1.00000000e-01 1.93524223e-01 3.74516250e-01 7.24779664e-01
1.40262421e+00 2.71441762e+00 5.25305561e+00 1.01659351e+01
1.96735469e+01 3.80730788e+01 7.36806300e+01 1.42589867e+02
2.75945932e+02 5.34022222e+02 1.03346236e+03 2.00000000e+03]
```

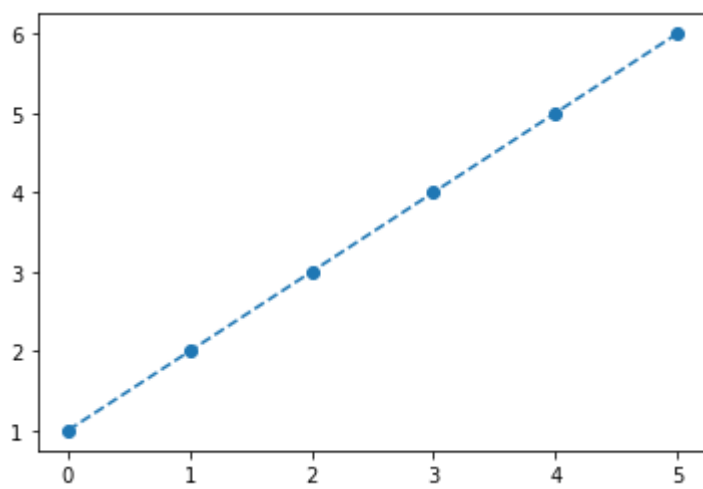


In [5]:

```
# You can use Python's script mode to run the Matplotlib program.

import numpy as np
import matplotlib.pyplot as plt
x = np.arange(6)
print(x)
type(x)
y=x+1
plt.plot(x, y, 'o--')
plt.show()
```

[0 1 2 3 4 5]

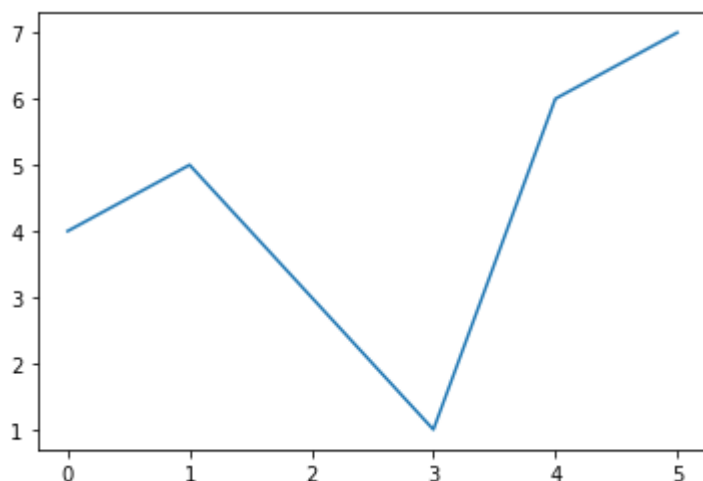


In [6]:

```
# When there is only one visualization in a figure that uses the function plot(), then  
# is known as a single-line plot.

%matplotlib inline
import matplotlib.pyplot as plt
x = [4, 5, 3, 1, 6, 7]
plt.plot(x)
plt.show()

# In this case, the values of the y-axis are assumed.
```

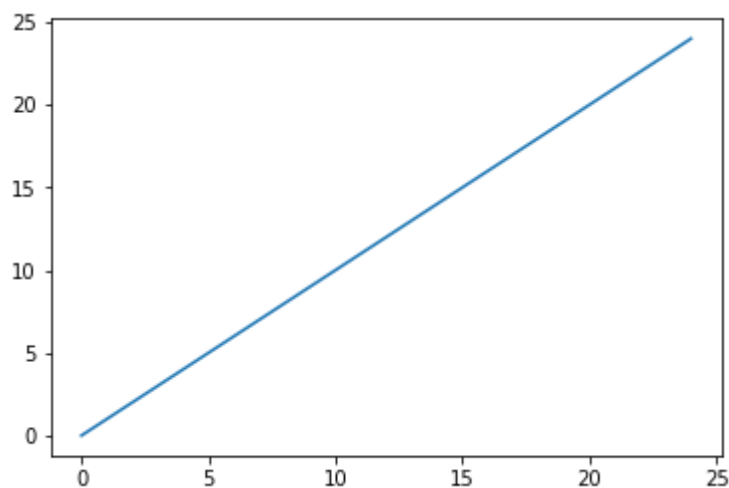


In [7]:



Here's another example of a single-line graph that uses an Narray:

```
import numpy as np
import matplotlib.pyplot as plt
x = np.arange(25)
plt.plot(x)
plt.show()
```

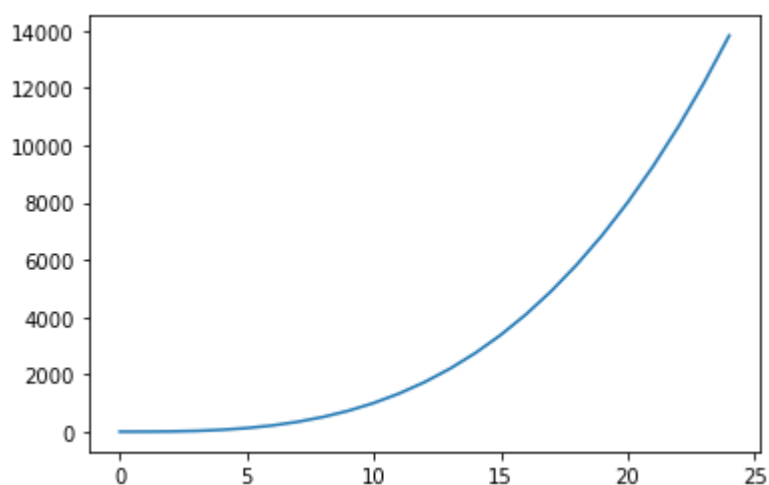


In [8]:



Let's visualize the quadratic graph $y = f(x) = x^3 + 1$. The code is as follows:

```
import numpy as np
import matplotlib.pyplot as plt
x = np.arange(25)
plt.plot(x, [(y**3 + 1) for y in x])
plt.show()
```

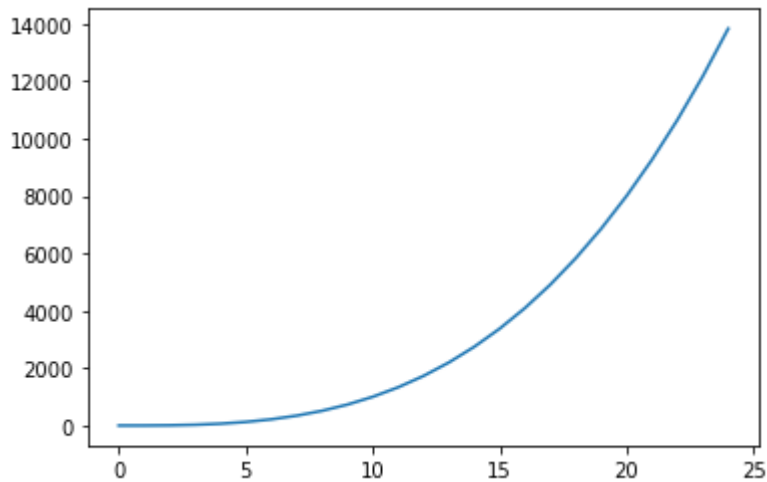


In [9]:



You can write the same code in a simple way as follows:

```
import numpy as np
import matplotlib.pyplot as plt
x = np.arange(25)
plt.plot(x, x**3 + 1)
plt.show()
```

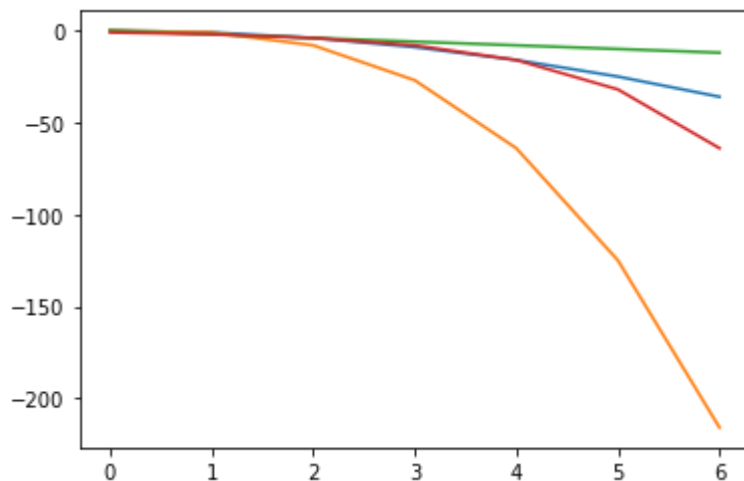


In [10]:



It is possible to visualize multiple plots in the same output. Let's see how to show multiple curves in the same visualization. The following is a simple example:

```
%matplotlib inline
import numpy as np
import matplotlib.pyplot as plt
x = np.arange(7)
plt.plot(x, -x**2)
plt.plot(x, -x**3)
plt.plot(x, -2*x)
plt.plot(x, -2**x)
plt.show()
```

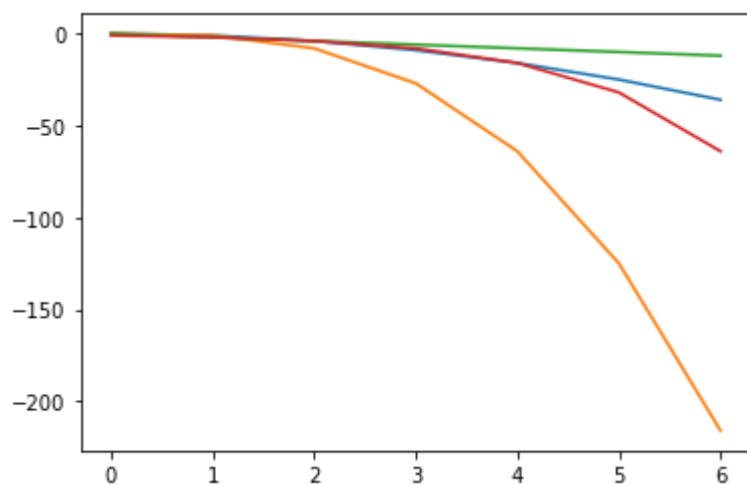


In [11]:



You can write the same code in a simple way as follows:

```
%matplotlib inline
import numpy as np
import matplotlib.pyplot as plt
x = np.arange(7)
plt.plot(x, -x**2, x, -x**3, x, -2*x, x, -2**x)
plt.show()
```

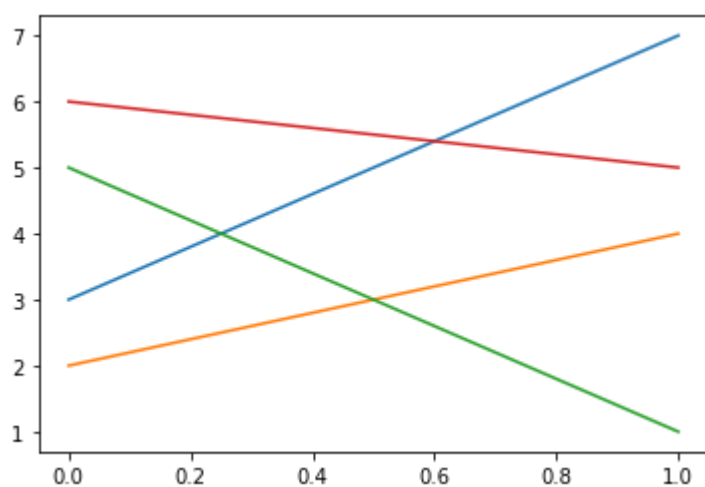


In [12]:



Let's see another example:

```
%matplotlib inline
import numpy as np
import matplotlib.pyplot as plt
x = np.array([[3, 2, 5, 6], [7, 4, 1, 5]])
plt.plot(x)
plt.show()
```



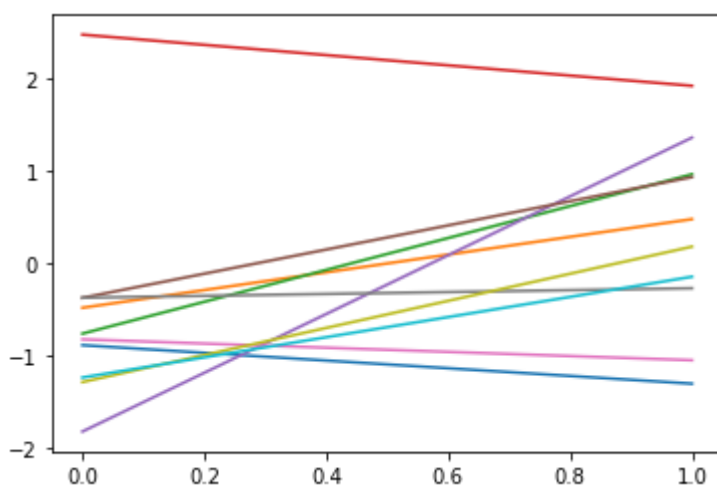
In [13]:



You can also create a multiline graph with random data as follows:

```
%matplotlib inline
import numpy as np
import matplotlib.pyplot as plt
data = np.random.randn(2, 10)
print(data)
plt.plot([data[0], data[1]])
plt.show()
```

```
[[ -0.88618633 -0.4825752  -0.76178326  2.4657351  -1.81893493 -0.37563486
  -0.82381565 -0.37427682 -1.2849678  -1.23569985]
 [ -1.30195569  0.47379691  0.95790941  1.91320096  1.35392727  0.92775103
  -1.04879171 -0.27212365  0.17692582 -0.14772508]]
```



In [14]:



*# In above example, we generated the data in a random way using the routine np.
random.randn(). Since this routine will generate the random data, the output will be
different every time we execute it. So, the output you will see will be different even
you execute the code.*