1. 5) NumPy Numerical Ranges Creation Routines

1) **arange()**

Returns evenly spaced values within a given interval.

In [1]:
```
import numpy as np

x = np.arange(10)
print(x)
```

```
[0 1 2 3 4 5 6 7 8 9]
```

2) **linspace().**

Returns evenly spaced numbers over a specified interval.

In [3]:
```
# N, The number of points.
N = 10

x = np.linspace(5, 10, N)
print(x)
```

```
[ 5.          5.55555556  6.11111111  6.66666667  7.22222222  7.77777778
  8.33333333  8.88888889  9.44444444 10.        ]
```

3) **logspace().**

Returns numbers spaced evenly on a log scale.

In [7]:
```
# N, The number of points.
N = 10

y = np.logspace(0.1, 1, N)
print(y)
```

```
[ 1.25892541  1.58489319  1.99526231  2.51188643  3.16227766  3.98107171
  5.01187234  6.30957344  7.94328235 10.        ]
```

4) **geomspace().**

Returns numbers spaced evenly on a log scale (a geometric progression).

In [8]:
```
# N, The number of points.
N = 10

y = np.geomspace(0.1, 1000, N)
print(y)
```

```
[1.00000000e-01 2.78255940e-01 7.74263683e-01 2.15443469e+00
 5.99484250e+00 1.66810054e+01 4.64158883e+01 1.29154967e+02
 3.59381366e+02 1.00000000e+03]
```