In [2]:
```
pip install numpy
```

```
Requirement already satisfied: numpy in /opt/anaconda3/lib/python3.1
2/site-packages (1.26.4)
Note: you may need to restart the kernel to use updated packages.
```

In [3]:
```
import numpy as np
```

In [4]:
```
demet= ('abc', np.arange(0,3,0.2), 2.5)
```

In [5]:
```
demet[2]
```

Out[5]:
```
2.5
```

In [6]:
```
# arange numpy a ait bir fonksiyondur, ondalıklı sayıları işleyebil
```

In [7]:
```
#Liste[dizi] Veriler
```

In [8]:
```
Liste1 =np.array([1,2,3])
```

In [9]:
```
Liste2 =np.array([4,5,6])
```

Dizilerde + simgesi ile sıralı toplama ve ".dot()" ile iki dizinin skaler çarpımı gerçekleşir.

In [10]:
```
Liste1 + Liste2
```

Out[10]:
```
array([5, 7, 9])
```

In [11]:
```
Liste1.dot(Liste2)
```

Out[11]:
```
32
```

In [12]:
```
import numpy as np
```

In [13]:
```
import pandas as pd
```

In [14]:
```
t=np.arange(0,5,0.1)
```

In [15]:
```
x=np.sin(t)
```

In [16]:
```
y=np.cos(t)
```

In [54]:
```
df=pd.DataFrame({'Zaman':t, 'x':x, 'y':y})
```

In [18]:
```
df.head(10)
```

Out[18]:

	Zaman	x	y
0	0.0	0.000000	1.000000
1	0.1	0.099833	0.995004
2	0.2	0.198669	0.980067
3	0.3	0.295520	0.955336
4	0.4	0.389418	0.921061
5	0.5	0.479426	0.877583
6	0.6	0.564642	0.825336
7	0.7	0.644218	0.764842
8	0.8	0.717356	0.696707
9	0.9	0.783327	0.621610

In [60]:
```
veri=df[['Zaman', 'x']]
veri.head()     #veri isimli veri kümesini tanımladık
```

Out[60]:

	Zaman	x
0	0.0	0.000000
1	0.1	0.099833
2	0.2	0.198669
3	0.3	0.295520
4	0.4	0.389418

In [58]:
```
veri.tail()  #son 5 satır
```

Out[58]:

	Zaman	x
45	4.5	-0.977530
46	4.6	-0.993691
47	4.7	-0.999923
48	4.8	-0.996165
49	4.9	-0.982453

In [62]:
```
veri[2:5]  #veri şablonundaki 2,3,4. satırlar gelir
```

Out[62]:

	Zaman	x
2	0.2	0.198669
3	0.3	0.295520
4	0.4	0.389418

In [66]:
```
df.iloc[4:10, [0,2]]  #birinci bileşen satır aralığını, ikinci birl
```

Out[66]:

	Zaman	y
4	0.4	0.921061
5	0.5	0.877583
6	0.6	0.825336
7	0.7	0.764842
8	0.8	0.696707
9	0.9	0.621610

SERİ VERİLER - Listeden Seri Oluşturma

Tablodaki bir sütun gibidir.

In [70]:
```
import pandas as pd
```

In [72]:
```
a=[1,3,5,7]
```

In [74]:
```
Seri=pd.Series(a)
```

In [76]:
```
print (Seri)
```

```
0    1
1    3
2    5
3    7
dtype: int64
```

In [78]:
```
print(Seri[2])
```

```
5
```

Serilerde Etiket Oluşturma - index öğesi

In [82]:
```
a=[1,3,5,7]
Seri=pd.Series(a, index=["a","b","c","d"])
print(Seri)
```

```
a    1
b    3
c    5
d    7
dtype: int64
```

In [86]:
```
print(Seri["c"])
```

```
5
```

Serilerde sözlük tipine benzer olarak anahtar/değer nesnesi kullanılabilir

In [89]:
```
sayfalar={"1.gün":20, "2.gün":80, "3.gün":90}
Seri= pd.Series(sayfalar)
print(Seri)
```

```
1.gün    20
2.gün    80
3.gün    90
dtype: int64
```

In [91]:
```
Seri2=pd.Series(sayfalar,index=["1.gün", "3.gün"])   #Sadece belirl
```

In [93]:
```
print(Seri2)
```

```
1.gün    20
3.gün    90
dtype: int64
```

RASTGELE SAYI ÜRETİMİ- "np.random.randn()"-- normal dağılan sayılar
"np.random.randint()"--düzgün dağıtılmış tamsayılar
"seed" komutu ile rastegele üretilen sayılar sabitlenir

In [ ]:
```

```

In [ ]:
```

```

In [95]:
```
np.random.seed(seed=0)
x=np.random.randn(1000)
y=np.random.randn(100)
z=np.random.randn(10)
```

In [97]:
```
x
```

Out[97]:
```
array([ 1.76405235e+00,  4.00157208e-01,  9.78737984e-01,  2.24089
320e+00,
        1.86755799e+00, -9.77277880e-01,  9.50088418e-01, -1.51357
208e-01,
       -1.03218852e-01,  4.10598502e-01,  1.44043571e-01,  1.45427
351e+00,
        7.61037725e-01,  1.21675016e-01,  4.43863233e-01,  3.33674
327e-01,
        1.49407907e+00, -2.05158264e-01,  3.13067702e-01, -8.54095
739e-01,
       -2.55298982e+00,  6.53618595e-01,  8.64436199e-01, -7.42165
```

```
020e-01,
        2.26975462e+00, -1.45436567e+00,  4.57585173e-02, -1.87183
850e-01,
        1.53277921e+00,  1.46935877e+00,  1.54947426e-01,  3.78162
520e-01,
       -8.87785748e-01, -1.98079647e+00, -3.47912149e-01,  1.56348
969e-01,
        1.23029068e+00,  1.20237985e+00, -3.87326817e-01, -3.02302
751e-01,
       -1.04855297e+00, -1.42001794e+00, -1.70627019e+00,  1.95077
540e+00,
       -5.09652182e-01, -4.38074302e-01, -1.25279536e+00,  7.77490
356e-01,
       -1.61389785e+00, -2.12740280e-01, -8.95466561e-01,  3.86902
498e-01,
       -5.10805138e-01, -1.18063218e+00, -2.81822283e-02,  4.28331
871e-01,
        6.65172224e-02,  3.02471898e-01, -6.34322094e-01, -3.62741
166e-01,
       -6.72460448e-01, -3.59553162e-01, -8.13146282e-01, -1.72628
260e+00,
        1.77426142e-01, -4.01780936e-01, -1.63019835e+00,  4.62782
256e-01,
       -9.07298364e-01,  5.19453958e-02,  7.29090562e-01,  1.28982
911e-01,
        1.13940068e+00, -1.23482582e+00,  4.02341641e-01, -6.84810
091e-01,
       -8.70797149e-01, -5.78849665e-01, -3.11552532e-01,  5.61653
422e-02,
       -1.16514984e+00,  9.00826487e-01,  4.65662440e-01, -1.53624
369e+00,
        1.48825219e+00,  1.89588918e+00,  1.17877957e+00, -1.79924
836e-01,
       -1.07075262e+00,  1.05445173e+00, -4.03176947e-01,  1.22244
507e+00,
        2.08274978e-01,  9.76639036e-01,  3.56366397e-01,  7.06573
168e-01,
        1.05000207e-02,  1.78587049e+00,  1.26912093e-01,  4.01989
363e-01,
        1.88315070e+00, -1.34775906e+00, -1.27048500e+00,  9.69396
708e-01,
       -1.17312341e+00,  1.94362119e+00, -4.13618981e-01, -7.47454
811e-01,
        1.92294203e+00,  1.48051479e+00,  1.86755896e+00,  9.06044
658e-01,
       -8.61225685e-01,  1.91006495e+00, -2.68003371e-01,  8.02456
396e-01,
        9.47251968e-01, -1.55010093e-01,  6.14079370e-01,  9.22206
672e-01,
        3.76425531e-01, -1.09940079e+00,  2.98238174e-01,  1.32638
590e+00,
       -6.94567860e-01, -1.49634540e-01, -4.35153552e-01,  1.84926
373e+00,
        6.72294757e-01,  4.07461836e-01, -7.69916074e-01,  5.39249
191e-01,
       -6.74332661e-01,  3.18305583e-02, -6.35846078e-01,  6.76433
```

```
295e-01,
        5.76590817e-01, -2.08298756e-01,  3.96006713e-01, -1.09306
151e+00,
       -1.49125759e+00,  4.39391701e-01,  1.66673495e-01,  6.35031
437e-01,
        2.38314477e+00,  9.44479487e-01, -9.12822225e-01,  1.11701
629e+00,
       -1.31590741e+00, -4.61584605e-01, -6.82416053e-02,  1.71334
272e+00,
       -7.44754822e-01, -8.26438539e-01, -9.84525244e-02, -6.63478
286e-01,
        1.12663592e+00, -1.07993151e+00, -1.14746865e+00, -4.37820
045e-01,
       -4.98032451e-01,  1.92953205e+00,  9.49420807e-01,  8.75512
414e-02,
       -1.22543552e+00,  8.44362976e-01, -1.00021535e+00, -1.54477
110e+00,
        1.18802979e+00,  3.16942612e-01,  9.20858824e-01,  3.18727
653e-01,
        8.56830612e-01, -6.51025593e-01, -1.03424284e+00,  6.81594
518e-01,
       -8.03409664e-01, -6.89549778e-01, -4.55532504e-01,  1.74791
590e-02,
       -3.53993911e-01, -1.37495129e+00, -6.43618403e-01, -2.22340
315e+00,
        6.25231451e-01, -1.60205766e+00, -1.10438334e+00,  5.21650
793e-02,
       -7.39562996e-01,  1.54301460e+00, -1.29285691e+00,  2.67050
869e-01,
       -3.92828182e-02, -1.16809350e+00,  5.23276661e-01, -1.71546
331e-01,
        7.71790551e-01,  8.23504154e-01,  2.16323595e+00,  1.33652
795e+00,
       -3.69181838e-01, -2.39379178e-01,  1.09965960e+00,  6.55263
731e-01,
        6.40131526e-01, -1.61695604e+00, -2.43261244e-02, -7.38030
909e-01,
        2.79924599e-01, -9.81503896e-02,  9.10178908e-01,  3.17218
215e-01,
        7.86327962e-01, -4.66419097e-01, -9.44446256e-01, -4.10049
693e-01,
       -1.70204139e-02,  3.79151736e-01,  2.25930895e+00, -4.22571
517e-02,
       -9.55945000e-01, -3.45981776e-01, -4.63595975e-01,  4.81481
474e-01,
       -1.54079701e+00,  6.32619942e-02,  1.56506538e-01,  2.32181
036e-01,
       -5.97316069e-01, -2.37921730e-01, -1.42406091e+00, -4.93319
883e-01,
       -5.42861476e-01,  4.16050046e-01, -1.15618243e+00,  7.81198
102e-01,
        1.49448454e+00, -2.06998503e+00,  4.26258731e-01,  6.76908
035e-01,
       -6.37437026e-01, -3.97271814e-01, -1.32880578e-01, -2.97790
879e-01,
       -3.09012969e-01, -1.67600381e+00,  1.15233156e+00,  1.07961
```

```
859e+00,
       -8.13364259e-01, -1.46642433e+00,  5.21064876e-01, -5.75787
970e-01,
        1.41953163e-01, -3.19328417e-01,  6.91538751e-01,  6.94749
144e-01,
       -7.25597378e-01, -1.38336396e+00, -1.58293840e+00,  6.10379
379e-01,
       -1.18885926e+00, -5.06816354e-01, -5.96314038e-01, -5.25672
963e-02,
       -1.93627981e+00,  1.88778597e-01,  5.23891024e-01,  8.84220
870e-02,
       -3.10886172e-01,  9.74001663e-02,  3.99046346e-01, -2.77259
276e+00,
        1.95591231e+00,  3.90093323e-01, -6.52408582e-01, -3.90953
375e-01,
        4.93741777e-01, -1.16103939e-01, -2.03068447e+00,  2.06449
286e+00,
       -1.10540657e-01,  1.02017271e+00, -6.92049848e-01,  1.53637
705e+00,
        2.86343689e-01,  6.08843834e-01, -1.04525337e+00,  1.21114
529e+00,
        6.89818165e-01,  1.30184623e+00, -6.28087560e-01, -4.81027
118e-01,
        2.30391670e+00, -1.06001582e+00, -1.35949701e-01,  1.13689
136e+00,
        9.77249677e-02,  5.82953680e-01, -3.99449029e-01,  3.70055
888e-01,
       -1.30652685e+00,  1.65813068e+00, -1.18164045e-01, -6.80178
204e-01,
        6.66383082e-01, -4.60719787e-01, -1.33425847e+00, -1.34671
751e+00,
        6.93773153e-01, -1.59573438e-01, -1.33701560e-01,  1.07774
381e+00,
       -1.12682581e+00, -7.30677753e-01, -3.84879809e-01,  9.43515
893e-02,
       -4.21714513e-02, -2.86887192e-01, -6.16264021e-02, -1.07305
276e-01,
       -7.19604389e-01, -8.12992989e-01,  2.74516358e-01, -8.90915
083e-01,
       -1.15735526e+00, -3.12292251e-01, -1.57667016e-01,  2.25672
350e+00,
       -7.04700276e-01,  9.43260725e-01,  7.47188334e-01, -1.18894
496e+00,
        7.73252977e-01, -1.18388064e+00, -2.65917224e+00,  6.06319
524e-01,
       -1.75589058e+00,  4.50934462e-01, -6.84010898e-01,  1.65955
080e+00,
        1.06850940e+00, -4.53385804e-01, -6.87837611e-01, -1.21407
740e+00,
       -4.40922632e-01, -2.80355495e-01, -3.64693544e-01,  1.56703
855e-01,
        5.78521498e-01,  3.49654457e-01, -7.64143924e-01, -1.43779
147e+00,
        1.36453185e+00, -6.89449185e-01, -6.52293600e-01, -5.21189
312e-01,
       -1.84306955e+00, -4.77974004e-01, -4.79655814e-01,  6.20358
```

```
298e-01,
        6.98457149e-01,  3.77088909e-03,  9.31848374e-01,  3.39964
984e-01,
       -1.56821116e-02,  1.60928168e-01, -1.90653494e-01, -3.94849
514e-01,
       -2.67733537e-01, -1.12801133e+00,  2.80441705e-01, -9.93123
611e-01,
        8.41631264e-01, -2.49458580e-01,  4.94949817e-02,  4.93836
776e-01,
        6.43314465e-01, -1.57062341e+00, -2.06903676e-01,  8.80178
912e-01,
       -1.69810582e+00,  3.87280475e-01, -2.25556423e+00, -1.02250
684e+00,
        3.86305518e-02, -1.65671510e+00, -9.85510738e-01, -1.47183
501e+00,
        1.64813493e+00,  1.64227755e-01,  5.67290278e-01, -2.22675
101e-01,
       -3.53431749e-01, -1.61647419e+00, -2.91837363e-01, -7.61492
212e-01,
        8.57923924e-01,  1.14110187e+00,  1.46657872e+00,  8.52551
939e-01,
       -5.98653937e-01, -1.11589699e+00,  7.66663182e-01,  3.56292
817e-01,
       -1.76853845e+00,  3.55481793e-01,  8.14519822e-01,  5.89255
892e-02,
       -1.85053671e-01, -8.07648488e-01, -1.44653470e+00,  8.00297
949e-01,
       -3.09114445e-01, -2.33466662e-01,  1.73272119e+00,  6.84501
107e-01,
        3.70825001e-01,  1.42061805e-01,  1.51999486e+00,  1.71958
931e+00,
        9.29505111e-01,  5.82224591e-01, -2.09460307e+00,  1.23721
914e-01,
       -1.30106954e-01,  9.39532294e-02,  9.43046087e-01, -2.73967
717e+00,
       -5.69312053e-01,  2.69904355e-01, -4.66845546e-01, -1.41690
611e+00,
        8.68963487e-01,  2.76871906e-01, -9.71104570e-01,  3.14817
205e-01,
        8.21585712e-01,  5.29264630e-03,  8.00564803e-01,  7.82601
752e-02,
       -3.95228983e-01, -1.15942052e+00, -8.59307670e-02,  1.94292
938e-01,
        8.75832762e-01, -1.15107468e-01,  4.57415606e-01, -9.64612
014e-01,
       -7.82629156e-01, -1.10389299e-01, -1.05462846e+00,  8.20247
837e-01,
        4.63130329e-01,  2.79095764e-01,  3.38904125e-01,  2.02104
356e+00,
       -4.68864188e-01, -2.20144129e+00,  1.99300197e-01, -5.06035
410e-02,
       -5.17519043e-01, -9.78829859e-01, -4.39189522e-01,  1.81338
429e-01,
       -5.02816701e-01,  2.41245368e+00, -9.60504382e-01, -7.93117
363e-01,
       -2.28862004e+00,  2.51484415e-01, -2.01640663e+00, -5.39454
```

```
633e-01,
       -2.75670535e-01, -7.09727966e-01,  1.73887268e+00,  9.94394
391e-01,
        1.31913688e+00, -8.82418819e-01,  1.12859406e+00,  4.96000
946e-01,
        7.71405949e-01,  1.02943883e+00, -9.08763246e-01, -4.24317
621e-01,
        8.62596011e-01, -2.65561909e+00,  1.51332808e+00,  5.53132
064e-01,
       -4.57039607e-02,  2.20507656e-01, -1.02993528e+00, -3.49943
365e-01,
        1.10028434e+00,  1.29802197e+00,  2.69622405e+00, -7.39246
663e-02,
       -6.58552967e-01, -5.14233966e-01, -1.01804188e+00, -7.78547
559e-02,
        3.82732430e-01, -3.42422805e-02,  1.09634685e+00, -2.34215
801e-01,
       -3.47450652e-01, -5.81268477e-01, -1.63263453e+00, -1.56776
772e+00,
       -1.17915793e+00,  1.30142807e+00,  8.95260273e-01,  1.37496
407e+00,
       -1.33221165e+00, -1.96862469e+00, -6.60056320e-01,  1.75818
953e-01,
        4.98690275e-01,  1.04797216e+00,  2.84279671e-01,  1.74266
878e+00,
       -2.22605681e-01, -9.13079218e-01, -1.68121822e+00, -8.88971
358e-01,
        2.42117961e-01, -8.88720257e-01,  9.36742464e-01,  1.41232
771e+00,
       -2.36958691e+00,  8.64052300e-01, -2.23960406e+00,  4.01499
055e-01,
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In [99]:
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Out[99]:
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In [101…
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z
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Out[101…
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In [ ]: