Python Practice 1

Probability and Statistics Programming (Sejong University)

Date: 2019.04.01 (By: S.M. Riazul Islam)

List and its repetition

In [5]:
```
# a is a list
a=[3,2,6]

# a will be reapeated by 3 times
# a is still a list
a=3*a
a
```

Out[5]:
```
[3, 2, 6, 3, 2, 6, 3, 2, 6]
```

Convert a List to an array of numbers using numpy

In [8]:
```
import numpy as np
a=[3,2,6]
a=np.asarray(a)

# each element of a will be multiplied by 3
a=3*a
a
```

Out[8]:
```
array([ 9,  6, 18])
```

Some numpy functions

In [15]:
```
import numpy as np
a=np.multiply(100,3)
a
```

Out[15]:
```
300
```

In [18]:
```
a=np.divide(50,3)
a
```

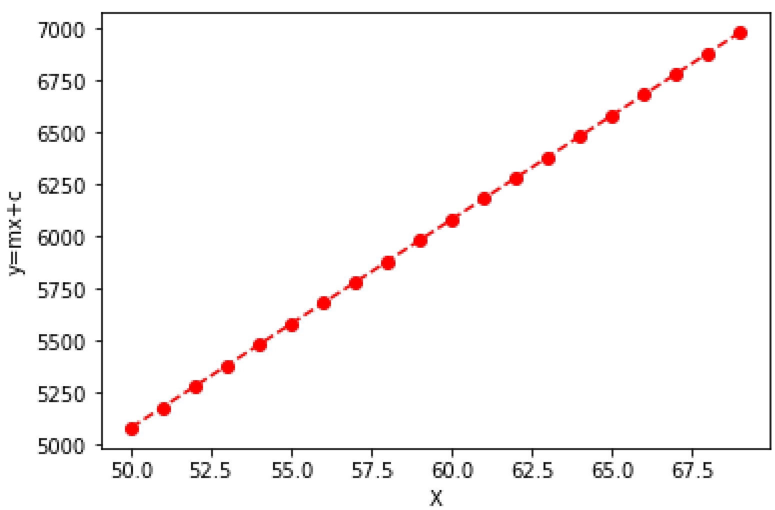
Out[18]:
```
16.666666666666668
```

In [19]:
```
a=np.remainder(50,3)
a
```
Out[19]: 2

In [21]:
```
start=1
end=10
a=np.arange(start,end)
a
```
Out[21]: array([1, 2, 3, 4, 5, 6, 7, 8, 9])

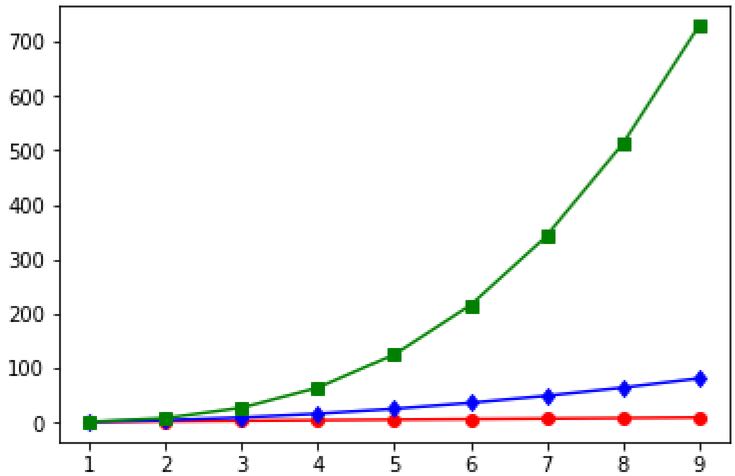
Plot y=mx+c

In [6]:
```
import numpy as np
import matplotlib.pyplot as plt
x=np.arange(50,70)
y=100*x+80   # m=100, c=80
plt.plot(x,y,'ro--')
plt.xlabel("X")
plt.ylabel("y=mx+c")
plt.show()    # to show the plot if required
```



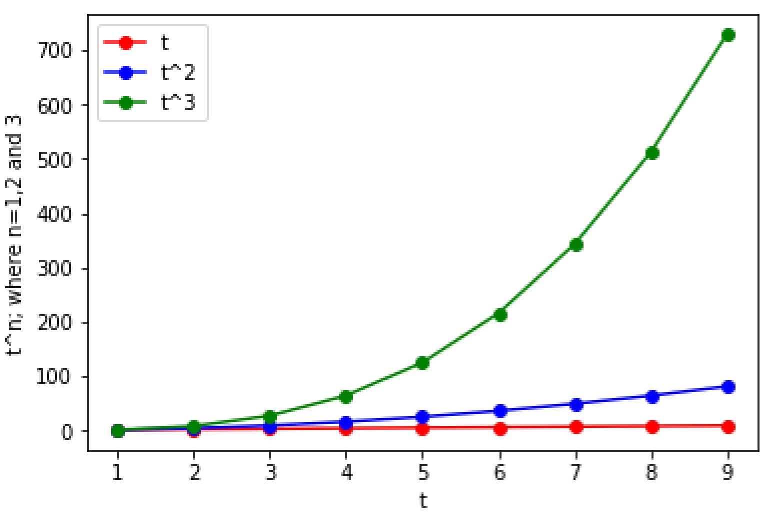
Plot t vs. t; t vs. t^2; and t vs. t^3

In [33]:
```
import numpy as np
import matplotlib.pyplot as plt
t=np.arange(1,10)
plt.plot(t,t,'ro-',t,t**2,'bd-',t,t**3,'gs-')
plt.show()    # to show the plot if required
```



Plot with Legend

In [8]:
```
import numpy as np
import matplotlib.pyplot as plt
t=np.arange(1,10)
plt.plot(t,t,'ro-',label="t")
plt.plot(t,t**2,'bo-',label="t^2")
plt.plot(t,t**3,'go-',label="t^3")
plt.legend()
plt.xlabel("t")
plt.ylabel("t^n; where n=1,2 and 3")
plt.show()    # to show the plot if required
```



Binomial Distribution: pmf

In [12]:
```
import numpy as np
import scipy.stats as sp
n=10
x=3
p=0.5
sp.binom.pmf(x,n,p) #p(x)
```

Out[12]:
```
0.11718750000000014
```

In [15]:
```
import numpy as np
import scipy.stats as sp
n=10
x=np.arange(11)
p=0.5
sp.binom.pmf(x,n,p) #p(x_i)
```

Out[15]:
```
array([0.00097656, 0.00976563, 0.04394531, 0.1171875 , 0.20507813,
       0.24609375, 0.20507813, 0.1171875 , 0.04394531, 0.00976563,
       0.00097656])
```

Poisson Distribution: pmf

In [16]:
```
import numpy as np
import scipy.stats as sp
rate=2
x=4
sp.poisson.pmf(rate,x) #p(x)
```

Out[16]:
```
0.14652511110987343
```

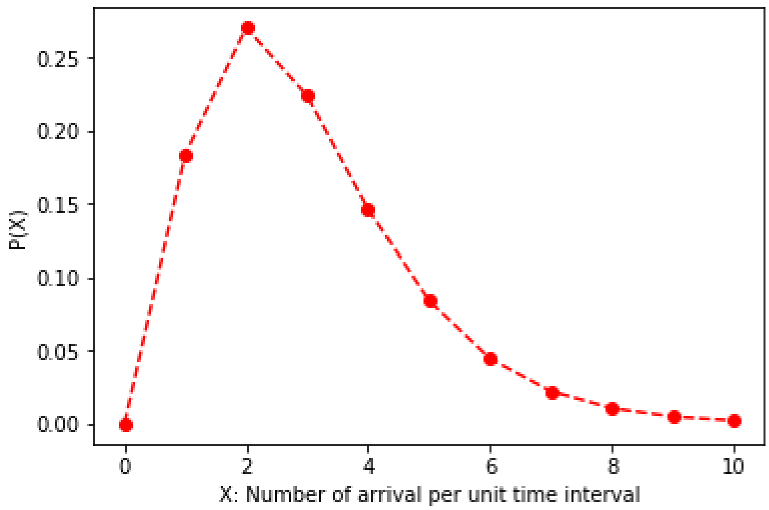
In [17]:
```
import numpy as np
import scipy.stats as sp
rate=2
x=np.arange(11)
sp.poisson.pmf(rate,x) #p(x_i)
```

Out[17]:
```
array([0.        , 0.18393972, 0.27067057, 0.22404181, 0.14652511,
       0.08422434, 0.04461754, 0.02234111, 0.0107348 , 0.0049981 ,
       0.00227   ])
```

Plot pmf for Poisson Distribution

In [19]:
```
import numpy as np
import scipy.stats as sp
import matplotlib.pyplot as plt
rate=2
x=np.arange(11)
ppoisson=sp.poisson.pmf(rate,x)
plt.plot(x,ppoisson,'ro--')
plt.xlabel("X: Number of arrival per unit time interval")
plt.ylabel("P(X)")
```

Out[19]:
```
Text(0, 0.5, 'P(X)')
```



In [21]:
```
print("Practice and Learn")
```

```
Practice and Learn
```

In [ ]: