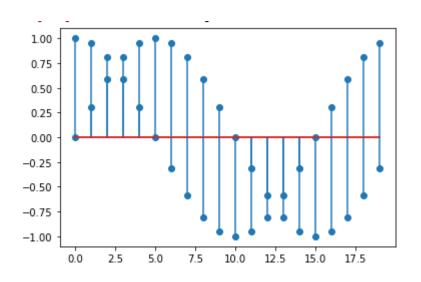
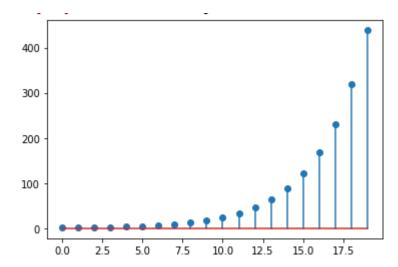
```
1.0
                                                            #%%
                                                            #Question 1
0.8
                                                            def genSig1(N,k) :
                                                                 r = np.zeros(N)
0.6
                                                                 r[k] = 1
                                                                 return r
0.4
                                                            R = genSig1(20,5)
                                                            plt.figure(1)
0.2
                                                            plt.stem(R)
0.0
                                                 17.5
           2.5
                 5.0
                        7.5
                              10.0
                                    12.5
                                          15.0
    0.0
1.0
                                                            #%%
                                                            #Question 2
0.8
                                                            def genSig2(N,k) :
                                                                r = np.zeros(N)
                                                                for i in range(k,N):
0.6
                                                                    r[i] = 1
                                                                return r
0.4
                                                            R = genSig2(20,5)
                                                           plt.figure(1)
0.2
                                                            plt.stem(R)
0.0
           2.5
                                          15.0
     0.0
                 5.0
                        7.5
                              10.0
                                    12.5
                                                 17.5
 30
                                                            #%%
                                                            #Question 3
                                                            def genSig3(N,k,R) :
 25
                                                                 r = np.zeros(N)
                                                                 tmp = 0
 20
                                                                 for i in range(k,N):
                                                                     tmp += R
 15
                                                                     r[i] = tmp
                                                                 return r
 10
                                                            R = genSig3(20,5,2)
  5
                                                            plt.figure(1)
                                                            plt.stem(R)
  0
            2.5
                  5.0
                                     12.5
     0.0
                        7.5
                              10.0
                                           15.0
                                                 17.5
                                                              #%%
                                                              #Question 4
  5
                                                              def genSig4(N,k,R) :
                                                                   r = np.zeros(N)
  4
                                                                   tmp = 0
                                                                   for i in range(k,k+k+1):
                                                                       r[i] = tmp
  3
                                                                       tmp += R
                                                                   for i in range(k+k,N-k):
  2
                                                                       tmp -= R
                                                                       r[i] = tmp
                                                                   return r
  1
                                                              R = genSig4(20,5,1)
                                                              plt.figure(1)
                                                              plt.stem(R)
                         7.5
                                           15.0
                                                  17.5
      0.0
            2.5
                  5.0
                               10.0
                                     12.5
```



```
#%%
#Question 5
def genSig5Sin(N,f,fs) :
    r = np.zeros(N)
    for i in range(N):
       r[i] = np.sin(2*np.pi*f*(float)(i/fs))
    return r
def genSig5Cos(N,f,fs) :
    r = np.zeros(N)
    t = np.linspace(0,(N-1)/float(fs), N)
    r = np.cos(2*np.pi*f*t)
    return r
R = genSig5Sin(20,1,20)
plt.figure(1)
plt.stem(R)
R = genSig5Cos(20,1,20)
plt.figure(1)
plt.stem(R)
```



```
#%%
#Question 6
def expsig(N,a) :
    ret = np.zeros(N)
    (r,phi) = cmath.polar(a)
    for i in range(N):
        ret[i] = (np.power(r,i)*np.exp(phi*r*i))
    return ret

R = expsig(20,0.95+(np.pi/10)*1j)
plt.figure(1)
plt.stem(R)
```