

```
In [1]: import numpy as np
import matplotlib.pyplot as plt
```

```
In [2]: data=np.array([1,0,1,0,1,0,1,1])
data
```

```
Out[2]: array([1, 0, 1, 0, 1, 0, 1, 1])
```

```
In [3]: data=np.hstack((data,[0]))
data
```

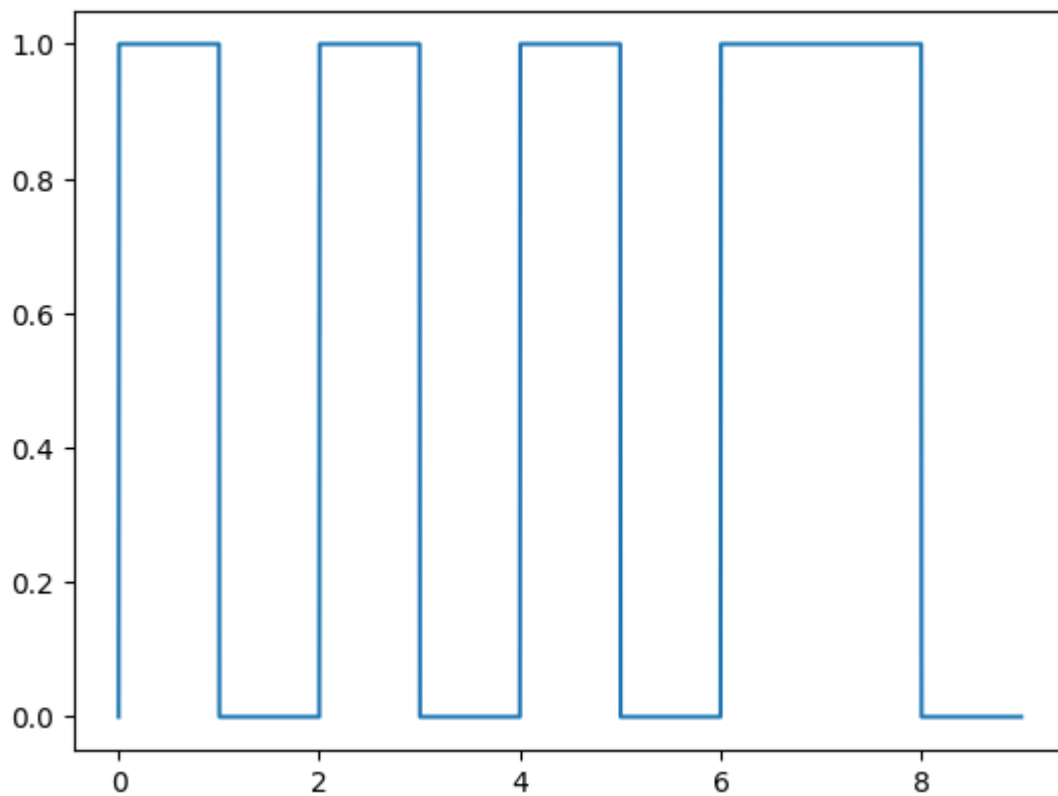
```
Out[3]: array([1, 0, 1, 0, 1, 0, 1, 1, 0])
```

```
In [4]: bitrate=1
T=len(data)/bitrate
n=500
N=n*len(data)#No of time Samples
```

```
In [5]: u_nrz=np.zeros((N,1))
u_rz=np.zeros((N,1))
p_nrz=np.zeros((N,1))
p_rz=np.zeros((N,1))
dt=T/N
t=np.arange(0,T,dt)
```

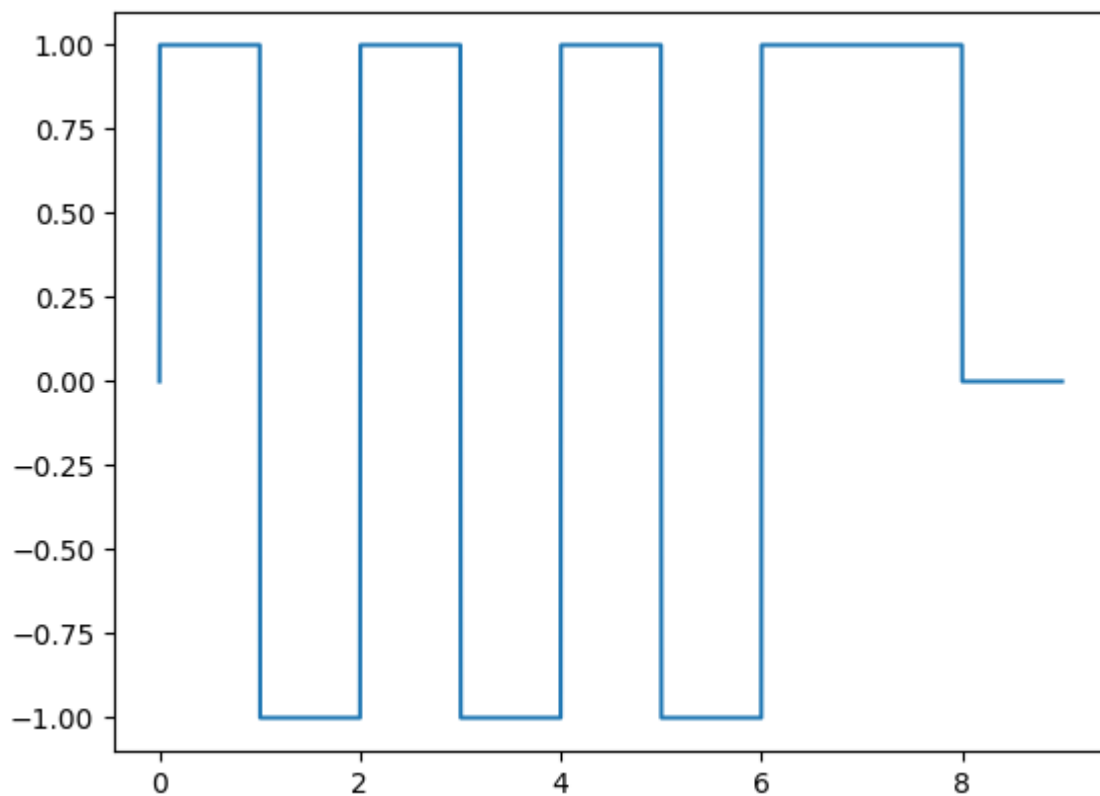
```
In [6]: #Unipolar NRZ
for i in range(len(data)-1):
    if data[i]==1:
        u_nrz[i*n+1:(i+1)*n+1]=1
    else:
        u_nrz[i*n+1:(i+1)*n+1]=0
plt.plot(t,u_nrz)
```

```
Out[6]: [<matplotlib.lines.Line2D at 0x7c2f25ab9ea0>]
```



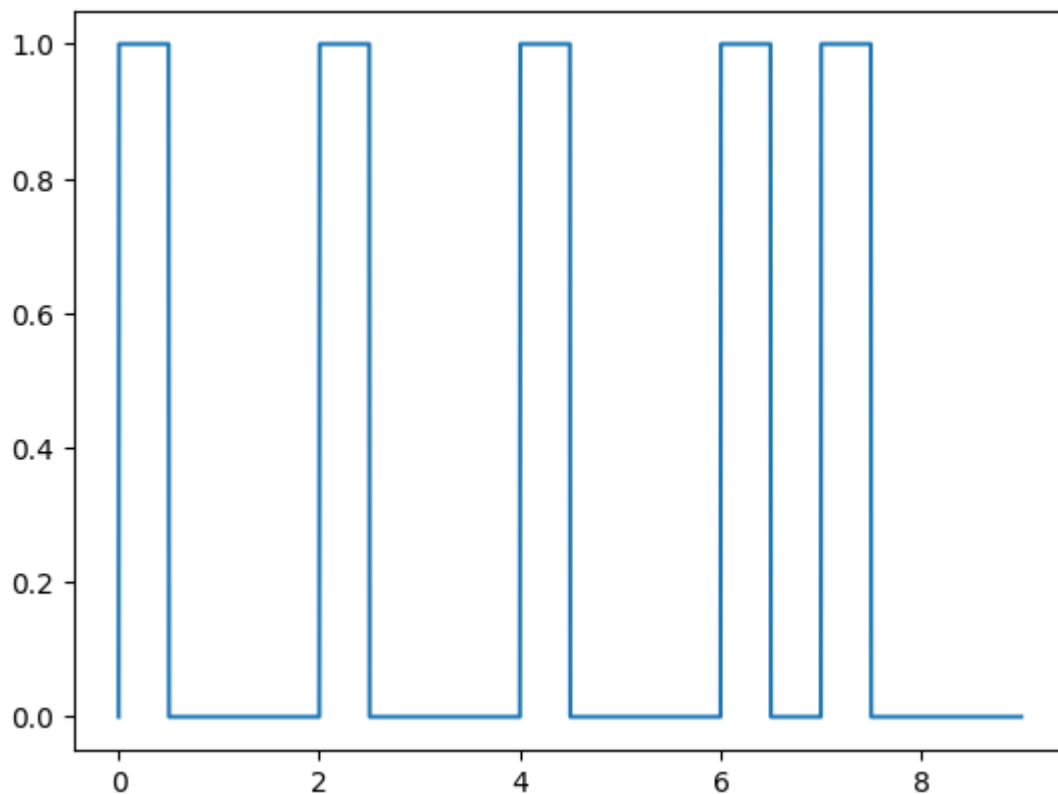
```
In [7]: #Polar NRZ
for i in range(len(data)-1):
    if data[i]==1:
        p_nrz[i*n+1:(i+1)*n+1]=1
    else:
        p_nrz[i*n+1:(i+1)*n+1]=-1
plt.plot(t,p_nrz)
```

Out[7]: [<matplotlib.lines.Line2D at 0x7c2f241ce2c0>]



```
In [8]: #Unipolar RZ
for i in range(len(data)-1):
    if data[i]==1:
        u_rz[int(i*n+1):int((i+0.5)*n)]=1
        u_rz[int((i+0.5)*n+1):int((i+1)*n+1)]=0
    else:
        u_rz[int(i*n+1):int((i+1)*n+1)]=0
plt.plot(t,u_rz)
```

Out[8]: [



```
In [9]: #Polar RZ
for i in range(len(data)-1):
    if data[i]==1:
        p_rz[int(i*n+1):int((i+0.5)*n)]=1
        p_rz[int((i+0.5)*n+1):int((i+1)*n+1)]=0
    else:
        p_rz[int(i*n+1):int((i+0.5)*n)]=-1
        p_rz[int((i+0.5)*n+1):int((i+1)*n+1)]=0
plt.plot(t,p_rz)
```

Out[9]: [

