In [1]:
```
import pandas as pd
import numpy as np
import math
from scipy.io.wavfile import read
```

In [2]:
```
transmit= read('Data/Task1_SignalDetection/Data/transmitSignal.wav')
transmit = np.array(transmit[1],dtype=float)
received = read('Data/Task1_SignalDetection/Data/7.wav')
received = np.array(received[1],dtype=float)
```

In [3]:
```
def corrcoeff_1d(A,B):
    # Rowwise mean of input arrays & subtract from input arrays themes
elves
    A_mA = A - A.mean(-1,keepdims=1)
    B_mB = B - B.mean(-1,keepdims=1)

    # Sum of squares
    ssA = np.einsum('i,i->',A_mA, A_mA)
    ssB = np.einsum('i,i->',B_mB, B_mB)

    # Finally get corr coeff
    return np.einsum('i,i->',A_mA,B_mB)/np.sqrt(ssA*ssB)
```

In [4]:
```
window = 1900 #length of the transmitted signal
N = len(received)
out = np.zeros(N)
for i in range(N):
    if i+window <=len(received) - len(transmit):
        out[i] = corrcoeff_1d(received[i:i+window], transmit)
```

In [ ]:
```
for i in range(len(out)):
    if out[i] == max(out):
        print(i)
```

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```