```
%reading the audio file
[a fs]=audioread("C:\Users\pooja\Desktop\Cryptography\sig100.wav")
```

```
a = 650000×2
   -0.0283   -0.0127
   -0.0283   -0.0127
   -0.0283   -0.0127
   -0.0283   -0.0127
   -0.0283   -0.0127
   -0.0283   -0.0127
   -0.0283   -0.0127
   -0.0283   -0.0127
   -0.0234   -0.0156
   -0.0264   -0.0156
      ⋮
fs = 360
```

```
%extracting the first 10 seconds of the audio file
a_cut = a((fs * (10- 1)) + 1 : fs * ( 20- 1), :)
```

```
a_cut = 3600×2
   -0.0527   -0.0234
   -0.0537   -0.0293
   -0.0557   -0.0293
   -0.0586   -0.0303
   -0.0586   -0.0312
   -0.0615   -0.0283
   -0.0596   -0.0273
   -0.0586   -0.0283
   -0.0576   -0.0283
   -0.0586   -0.0312
      ⋮
```

```
%changing the stereo wav file into a mono stream
a_cut_mono=reshape(a_cut,[],1)
```

```
a_cut_mono = 7200×1
   -0.0527
   -0.0537
   -0.0557
   -0.0586
   -0.0586
   -0.0615
   -0.0596
   -0.0586
   -0.0576
   -0.0586
      ⋮
```

```
%padding zeros to make a square matrix

sq_wave = [a_cut_mono,zeros(7200,7199)]
```

```
sq_wave = 7200×7200
   -0.0527         0         0         0         0         0         0         0 ···
   -0.0537         0         0         0         0         0         0         0
   -0.0557         0         0         0         0         0         0         0
   -0.0586         0         0         0         0         0         0         0
   -0.0586         0         0         0         0         0         0         0
   -0.0615         0         0         0         0         0         0         0
   -0.0596         0         0         0         0         0         0         0
   -0.0586         0         0         0         0         0         0         0
   -0.0576         0         0         0         0         0         0         0
   -0.0586         0         0         0         0         0         0         0
     ⋮
     ⋮
```

```
%generating a random key
key=rand(size(sq_wave))
```

```
key = 7200×7200
    0.5088    0.5747    0.0162    0.8375    0.1486    0.4227    0.6615    0.5994 ···
    0.8835    0.2691    0.7694    0.7706    0.1953    0.4081    0.4189    0.1044
    0.7889    0.8649    0.7041    0.8551    0.3656    0.3674    0.6525    0.4260
    0.8958    0.7270    0.4267    0.5589    0.4042    0.7296    0.5716    0.7778
    0.3911    0.6706    0.3637    0.6607    0.6748    0.2412    0.2144    0.7440
    0.6546    0.0771    0.7732    0.2788    0.5939    0.2222    0.5889    0.5975
    0.4000    0.5825    0.3809    0.8917    0.5367    0.1432    0.7986    0.3856
    0.5933    0.0098    0.4603    0.3446    0.5389    0.8934    0.9580    0.3371
    0.5433    0.3709    0.4153    0.6642    0.8369    0.3968    0.0570    0.5769
    0.2888    0.4232    0.0376    0.1324    0.4862    0.7770    0.7879    0.9940
     ⋮
     ⋮
```

```
%encryption
enc=sq_wave*key
```

```
enc = 7200×7200
   -0.0268   -0.0303   -0.0009   -0.0442   -0.0078   -0.0223   -0.0349   -0.0316 ···
   -0.0273   -0.0309   -0.0009   -0.0450   -0.0080   -0.0227   -0.0355   -0.0322
   -0.0283   -0.0320   -0.0009   -0.0466   -0.0083   -0.0235   -0.0368   -0.0334
   -0.0298   -0.0337   -0.0009   -0.0491   -0.0087   -0.0248   -0.0388   -0.0351
   -0.0298   -0.0337   -0.0009   -0.0491   -0.0087   -0.0248   -0.0388   -0.0351
   -0.0313   -0.0354   -0.0010   -0.0515   -0.0091   -0.0260   -0.0407   -0.0369
   -0.0303   -0.0342   -0.0010   -0.0499   -0.0089   -0.0252   -0.0394   -0.0357
   -0.0298   -0.0337   -0.0009   -0.0491   -0.0087   -0.0248   -0.0388   -0.0351
   -0.0293   -0.0331   -0.0009   -0.0483   -0.0086   -0.0244   -0.0381   -0.0345
   -0.0298   -0.0337   -0.0009   -0.0491   -0.0087   -0.0248   -0.0388   -0.0351
     ⋮
     ⋮
```

```
enc_col=enc(:,1)
```

```
enc_col = 7200×1
   -0.0268
   -0.0273
   -0.0283
   -0.0298
   -0.0298
   -0.0313
   -0.0303
   -0.0298
   -0.0293
```

```
   -0.0298
     ⋮
```

```
%decryption
dec=enc*inv(key)
```

```
dec = 7200×7200
   -0.0527    0.0000    0.0000    0.0000    0.0000   -0.0000    0.0000    0.0000 ···
   -0.0537    0.0000    0.0000    0.0000    0.0000   -0.0000    0.0000    0.0000
   -0.0557    0.0000    0.0000    0.0000    0.0000   -0.0000    0.0000    0.0000
   -0.0586    0.0000    0.0000    0.0000    0.0000   -0.0000    0.0000    0.0000
   -0.0586    0.0000    0.0000    0.0000    0.0000   -0.0000    0.0000    0.0000
   -0.0615    0.0000    0.0000    0.0000    0.0000   -0.0000    0.0000    0.0000
   -0.0596    0.0000    0.0000    0.0000    0.0000   -0.0000    0.0000    0.0000
   -0.0586    0.0000    0.0000    0.0000    0.0000   -0.0000    0.0000    0.0000
   -0.0576    0.0000    0.0000    0.0000    0.0000   -0.0000    0.0000    0.0000
   -0.0586    0.0000    0.0000    0.0000    0.0000   -0.0000    0.0000    0.0000
     ⋮
```

```
dec=dec(:,1)
```

```
dec = 7200×1
   -0.0527
   -0.0537
   -0.0557
   -0.0586
   -0.0586
   -0.0615
   -0.0596
   -0.0586
   -0.0576
   -0.0586
     ⋮
```

```
%converting it back into a 2 channel file
orig=reshape(dec,[],2);

%comparison of original file and decrypted file
a_cut
```

```
a_cut = 3600×2
   -0.0527   -0.0234
   -0.0537   -0.0293
   -0.0557   -0.0293
   -0.0586   -0.0303
   -0.0586   -0.0312
   -0.0615   -0.0283
   -0.0596   -0.0273
   -0.0586   -0.0283
   -0.0576   -0.0283
   -0.0586   -0.0312
     ⋮
```

```
orig
```

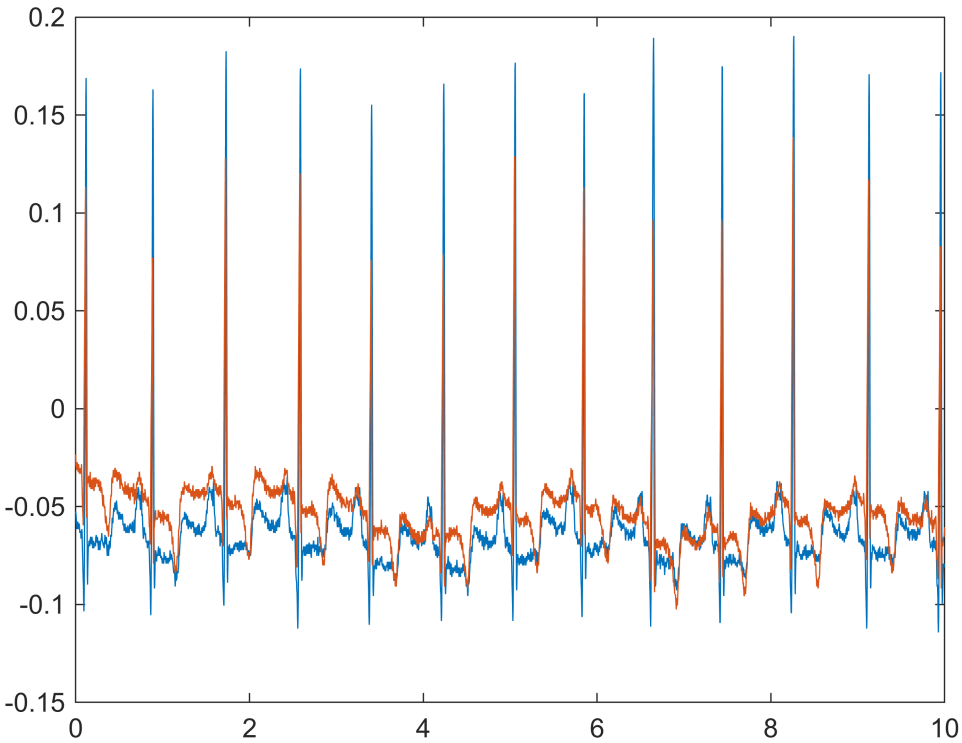
```
orig = 3600×2
   -0.0527   -0.0234
   -0.0537   -0.0293
   -0.0557   -0.0293
   -0.0586   -0.0303
   -0.0586   -0.0312
   -0.0615   -0.0283
   -0.0596   -0.0273
   -0.0586   -0.0283
   -0.0576   -0.0283
   -0.0586   -0.0312
      ⋮
```

```
%plotting the original, encrypted and decrypted waves

%original 2 channel waveform
xlabel("Time")
ylabel("Amplitude")
t_og=(0:length(a_cut)-1)/fs
```

```
t_og = 1×3600
         0    0.0028    0.0056    0.0083    0.0111    0.0139    0.0167    0.0194 ···
```

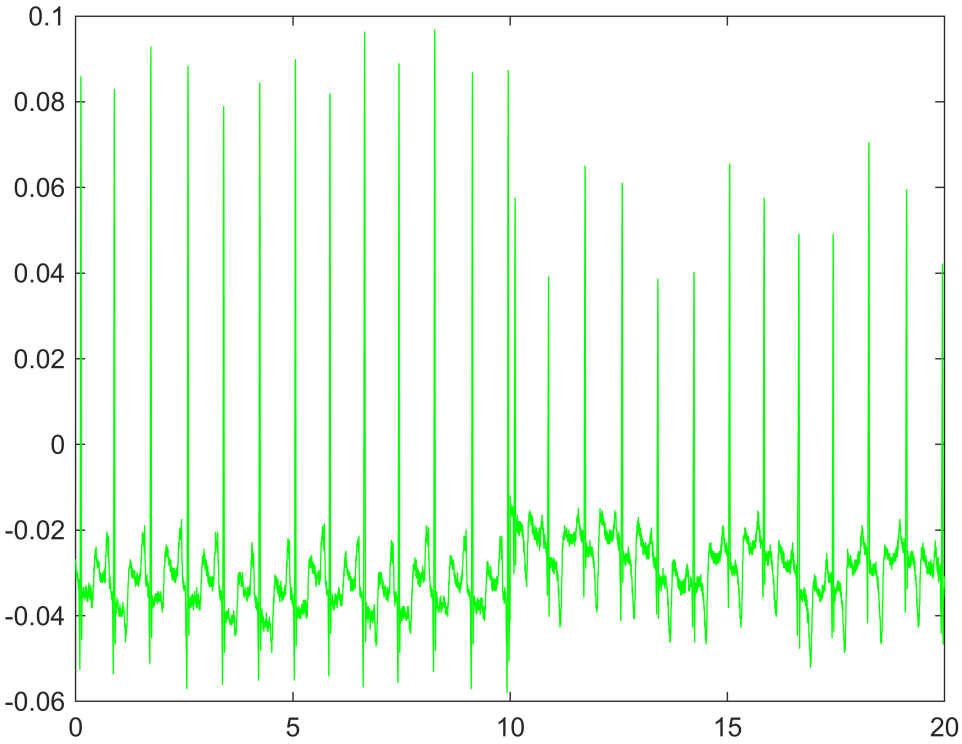
```
plot(t_og,a_cut)
```



```
%encrypted mono channel waveform
t_enc=(0:length(enc_col)-1)/fs
```

```
t_enc = 1×7200
         0    0.0028    0.0056    0.0083    0.0111    0.0139    0.0167    0.0194 ···
```

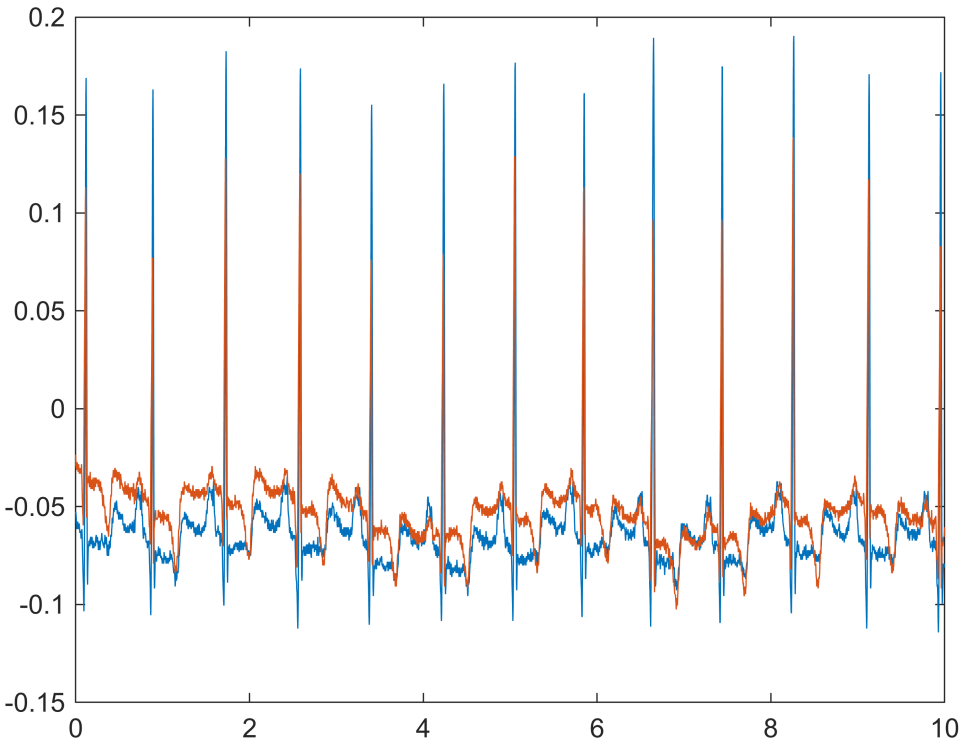
```
plot(t_enc,enc_col,'g')
```




```
%decrypted 2 channel waveform
t_dec=(0:length(orig)-1)/fs
```

```
t_dec = 1×3600
         0    0.0028    0.0056    0.0083    0.0111    0.0139    0.0167    0.0194 ···
```

```
plot(t_dec,orig)
```


0.2
0.15
0.1
0.05
0
-0.05
-0.1
-0.15
0
2
4
6
8
10