

## Lab 3

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2.

OFDM symbol generator

### **QPSK**

Example1-

Matrix

Columns 1 through 4

$1.0000 - 1.0000i$   $-1.0000 + 1.0000i$   $1.0000 + 1.0000i$   $-1.0000 + 1.0000i$

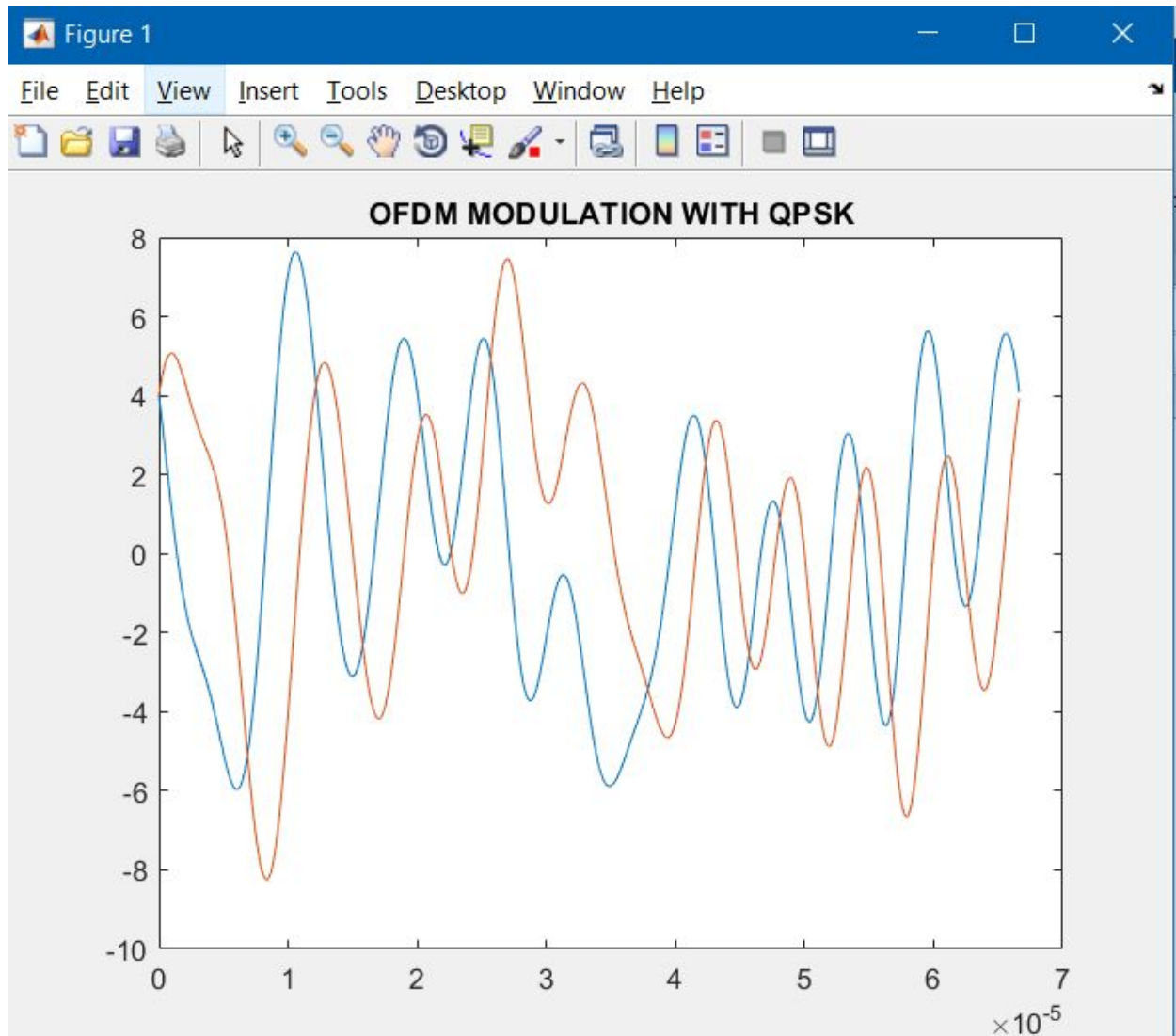
Columns 5 through 8

$1.0000 + 1.0000i$   $1.0000 + 1.0000i$   $1.0000 - 1.0000i$   $1.0000 - 1.0000i$

Columns 9 through 12

$-1.0000 - 1.0000i$   $1.0000 + 1.0000i$   $1.0000 + 1.0000i$   $-1.0000 + 1.0000i$

Plot:



Example 2

Matrix

Columns 1 through 4

1.0000 - 1.0000i 1.0000 + 1.0000i 1.0000 + 1.0000i 1.0000 + 1.0000i

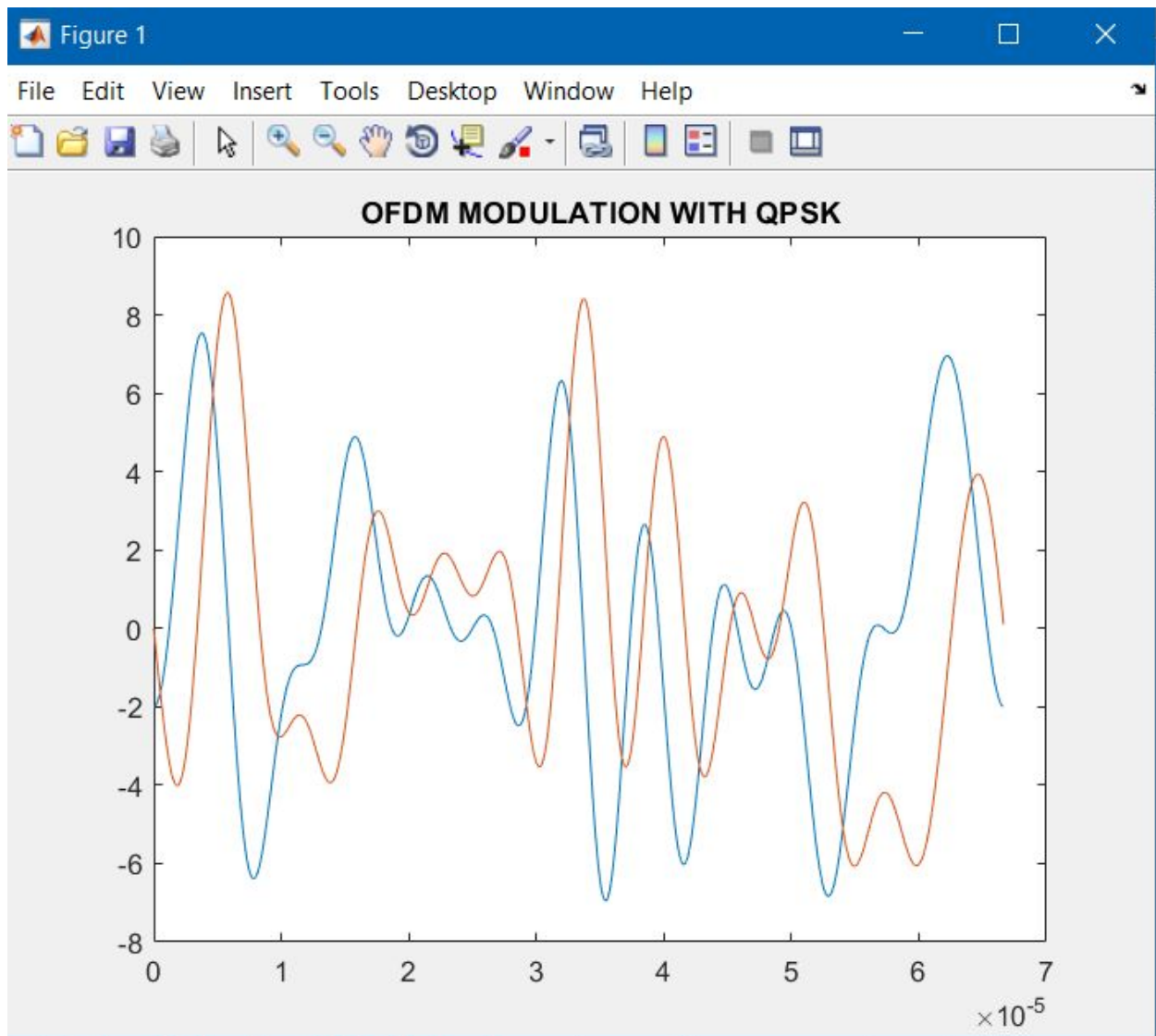
Columns 5 through 8

-1.0000 - 1.0000i -1.0000 - 1.0000i -1.0000 - 1.0000i -1.0000 + 1.0000i

Columns 9 through 12

-1.0000 - 1.0000i -1.0000 + 1.0000i -1.0000 - 1.0000i 1.0000 + 1.0000i

Plot:



## 16-QAM

Example 1:

Matrix:

Columns 1 through 5

$-0.2236 - 0.6708i$   $-0.2236 + 0.6708i$   $0.2236 + 0.6708i$   $0.2236 + 0.2236i$   $-0.2236 + 0.2236i$

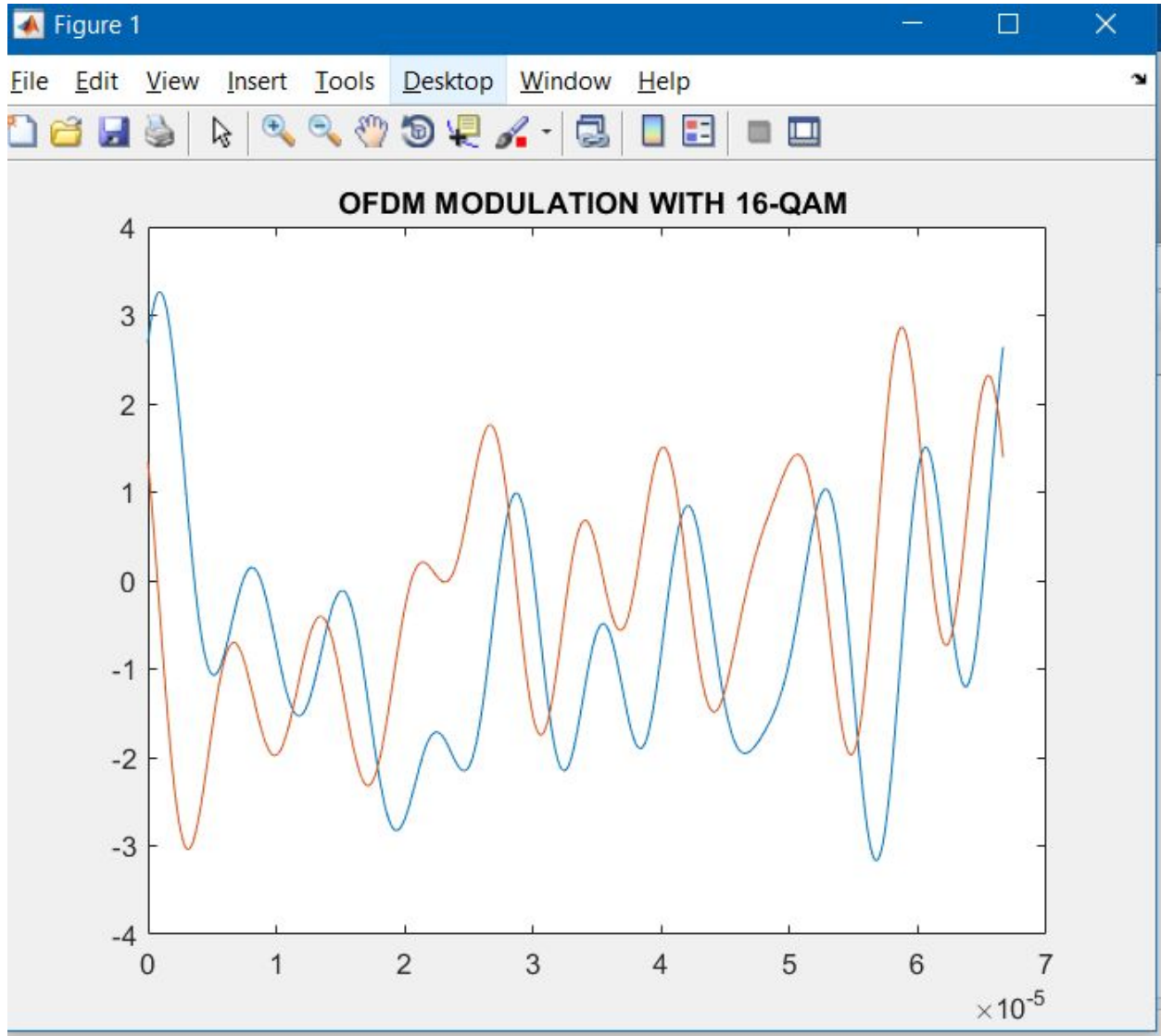
Columns 6 through 10

$0.2236 + 0.6708i$   $-0.2236 - 0.2236i$   $0.2236 - 0.2236i$   $0.6708 + 0.2236i$   $0.2236 + 0.6708i$

Columns 11 through 12

$0.6708 + 0.2236i$   $-0.2236 + 0.2236i$

Plot:



Example 2:

Matrix:

Columns 1 through 5

$-0.2236 + 0.6708i$   $-0.2236 + 0.2236i$   $0.2236 - 0.6708i$   $0.2236 + 0.2236i$   $0.2236 - 0.2236i$

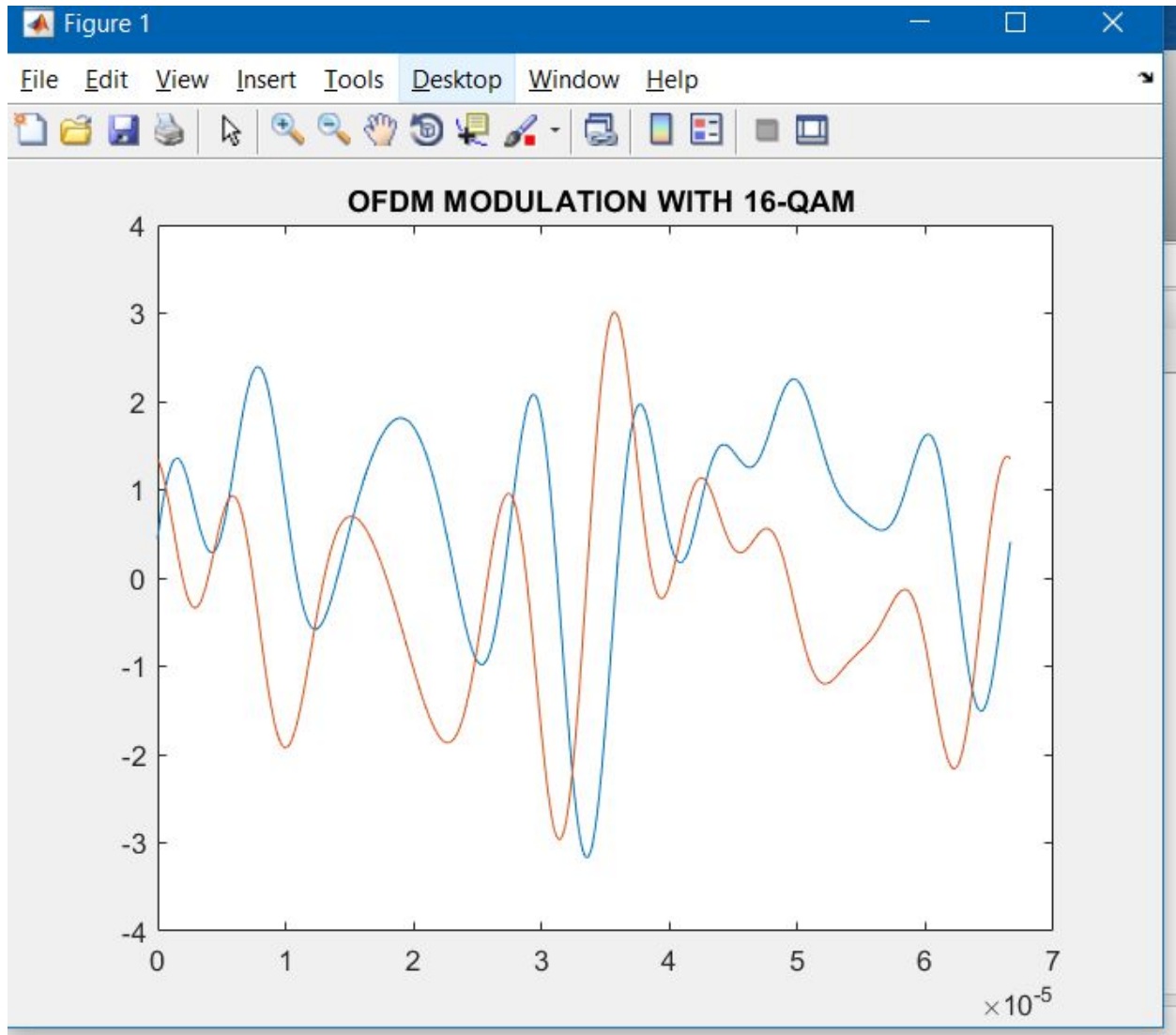
Columns 6 through 10

$0.2236 - 0.2236i$   $-0.2236 - 0.6708i$   $0.2236 + 0.6708i$   $0.2236 - 0.2236i$   $0.2236 + 0.6708i$

Columns 11 through 12

$0.2236 - 0.2236i$   $0.2236 + 0.2236i$

Plot:



3.  
Demodulation  
Test cases

Example 1:

```
mod = [0.2236 + 0.2236i -0.2236 - 0.6708i -0.2236 - 0.6708i -0.2236 + 0.6708i 0.6708 +
0.2236i 0.6708 - 0.2236i -0.2236 + 0.6708i 0.2236 - 0.6708i 0.6708 - 0.2236i 0.2236 -
0.6708i 0.2236 + 0.2236i 0.2236 - 0.2236i];
```

```
>> demoulationtester
```

```
k =
```

```
8
```

```
0.6708 - 0.2236i
```

Example 2:

```
mod = [0.6708 + 0.2236i 0.2236 - 0.6708i 0.6708 - 0.2236i -0.2236 - 0.6708i 0.2236 -
0.6708i 0.6708 + 0.2236i 0.6708 + 0.2236i 0.6708 - 0.2236i 0.2236 + 0.2236i 0.6708 +
0.2236i -0.2236 - 0.6708i 0.6708 - 0.2236i];
```

```
>> demoulationtester
```

```
k =
```

```
5
```

```
0.6708 - 0.2236i
```