

## Matlab practice

Presume we have two vectors:

```
a=[0 3 2 1 0];
```

```
b=[0 0 -2 -1 2 0 6 4 2 0];
```

What is the result of the following:

```
b(4:6)
```

```
[-1 2 0]
```

```
a'
```

```
a(1:2:5)
```

What is the position of maximum overlap between a and b, found by convolution (as define in class)?

**Shift of 5 (a(1) line up with b(6)) has maximum overlap.**

What is the multiplication result at the position of maximum overlap?

```
[0 3 2 1 0]' * [0 6 4 2 0] = 28
```

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Let us assume we have recorded the voltage responses  $v(t)$  from 20 neurons, over the course of 1000ms. The responses are in the 20x1000 matrix `neuronResponses`.

Each action potential is marked by the voltage rising above 5. (The resting state is -60.)  
How can you determine the time of the first action potential for neuron 10?

Write code to make a figure with four subplots, each subplot showing the voltage for neuron 5, 10, 15, and 20 respectively.

How can you compute the smallest voltage measured (across all neurons) at time  $t=1\text{ms}$ ?

```
min(neuronResponses(:,1))
```

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What is in the vector `w` as defined below?

```
for k=1:5,  
    w(k) = 3*k;  
end;
```