Systems Neuroscience
Matlab, continued

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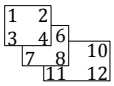
JMH 328A

Matrices in *n* dimensions

```
x=[1 2 3; 4 5 6]
```

$$\begin{bmatrix}1 & 2 & 3\\ 4 & 5 & 6\end{bmatrix}$$

```
y(:,:,1)=[1 2; 3 4]
y(:,:,2)=[5 6; 7 8]
y(:,:,3)=[9 10; 11 12]
size(y) ->[2 2 3]
```



- Typical brain data : location of neuron (x,y,z) + time + response

Heat-maps

imagesc(Data) – view 2D matrix of scaled data as image
- Red is highest value, blue is lowest value

Visualize a 2D slice of brain data (size(brainData) -> 128x128x88)

```
A=squeeze(brainData(:,:,20))
imagesc(A)
```

-> slice 20 of brain

Multiple plots

figure -> opens new plotting window

subplot(r,c,i) -> creates grid of plots with
- r rows
- c columns
- fill in position I

```
A=squeeze(brainData(:,:,10));
subplot(1,3,1); imagesc(A);
B=squeeze(brainData(:,:,20));
subplot(1,3,2); imagesc(B);
C=squeeze(brainData(:,:,30));
subplot(1,3,3); imagesc(C);
```


Scaling vs. not-scaling

`imagesc(Data)` – view 2D matrix of scaled data as image
- Red is highest value, blue is lowest value

`image(Data)` – view 2D matrix of data as image
- Red is 64 or higher, blue is 0 or lower

```
A=squeeze(brainData(:,:,10));
figure; imagesc(A);
```

vs

```
figure; image(A)
```

Repetition

Show four copies of brain slice 10:

```
A=squeeze(brainData(:,:,10));
figure; imagesc(A);
figure; imagesc(A);
figure; imagesc(A);
figure; imagesc(A);
```

OR

```
A=squeeze(brainData(:,:,10));
for k=1:4,
  figure; imagesc(A);
end;
```

Execution of `for`

- Assign `k` each value counting up from `start` value to `finish` value, repeating listed actions for each new value of `k`

```
for k=start:finish,
  action1 to repeat
  action2 to repeat
  action3 to repeat
end;
```