Last time in Matlab class...

• Compute rates for each 100ms window:
  rate(1)=sum(spikes(6,1:100))/0.1;
  rate(2)=sum(spikes(6,101:200))/0.1;
  rate(3)=sum(spikes(6,201:300))/0.1;
  rate(4)=sum(spikes(6,301:400))/0.1;
  rate(5)=sum(spikes(6,401:500))/0.1;

• Compute with for loop:
  for i=1:5
      rate(i)=sum(spikes(6,100*(i-1)+(1:100)))/0.1;
  end;

New data set: object and noise perception

View objects and noise
Task: press button if pic(t) == pic(t-1)
Variables: accuracy, reaction time, object or non-object

Questions:
• What picture was shown?
• What button was pressed?
• How quickly was button pressed?

Results recorded in: ExptRecord

ExptRecord columns

• ExptRecord(:,3) – 0 is noise, 1 is object
• ExptRecord(:,10) – 1 should press button,
  -1 should not press button
• ExptRecord(:,11) – 1 subject presses button,
  0 subject not press
• ExptRecord(:,12) – 0-1000ms,
  number of ms until button press

figure;plot(ExptRecord(:,3));
axis([0, 200, -.5, 1.5]);
figure;plot(sort(ExptRecord(:,12)))
Exploring your data

- **size** – data dimensions
- **plot** – display data contents in figure
- **max** – maximum value in vector
- **min** – minimum value in vector
- **mean** – mean (average) value in vector
- **sort** – order vector from low to high values
- **hist** – count frequency of values in vector
- **MatVariable(:)** – convert AxB matrix into single vector

Finding desired values

\[ \text{find(vector<number)} \]\n\[ \text{find(c<2)} \]
Return indices in vector that are less than number

**Example:**
\[ \text{vector=[5, -1, 0, 12];} \]
\[ \text{smallLocations=find(vector<2);} \]
\[ \text{smallLocations contains [2 3]} \]

Comparisons

- **d<2, d>2** strict inequality
- **d<=2, d>=2** semi-inequality
- **d==2** equality

Looking at data subsets

Looking at average Reaction Times for all button presses

\[ \text{buttonPress = find(ExptRecord(:,11)==1);} \]
\[ \text{mean(ExptRec(buttonPress,12))} \]

Looking at average Reaction Time for button press for objects vs noise

\[ \text{buttonPressNOISE = find(ExptRecord(:,3)==0} \& \text{ExptRecord(:,11)==1);} \]
\[ \text{mean(ExptRec(buttonPressNOISE,12))} \]
Equivalent code, broken into more lines:

\[ \text{pressVector=ExptRecord(:,11);} \]
\[ \text{noiseVector=ExptRecord(:,3);} \]
\[ \text{buttonPressNOISE = find(noiseVector==0} \& \text{pressVector==1);} \]
\[ \text{mean(ExptRec(buttonPressNOISE,12))} \]
Looking at data subsets

• Look at how often subject presses button when she should for objects and for noise:

```matlab
objI = find(ExptRecord(:,3)==1);
noiseI = find(ExptRecord(:,3)==0);
length(find(ExptRecord(objI,10)==ExptRecord(objI,11)))
length(find(ExptRecord(noiseI,10)==ExptRecord(noiseI,11)))
...turns out they are equal
```