Computing for Math and Stats

Lecture 8.

Plotting

- Matlab has many plotting commands

- The vanila version (plot) accepts 2 arguments: the X coordinate and the Y coordinate

- Accepts a string of specifiers:
  - rgb for red, green, blue
  - cmyk for cyan, magenta, yellow, black
  - w for white
  - -- for dashed
  - . dotted
  - d for diamonds

- See file SimpleSine.m, multplot.m

Plotting

- Easy to create simple plots
  - X=[0:100];
  - Y=sin(X*2*pi/100);
  - plot(X,Y,'—g')
- Often we need to
  - Have many curves in the same graph
  - Have labels
  - Plot functions
  - Do scatterplots
  - Plot histograms

Histogram

- Assume you want to make age statistics at York

- Somehow you get a vector of student ages called A

  - A[1] is the age of the first student

  - A[32321] is the age of the 32321th student

- How can you see how many students are 21 years old?

- Matlab has a histogram function (and an older function named hist).

- See randomfun.m, UniPlot.m, Gplot.m,

Histogram

- The range of the data is split into equal sized buckets

- If the youngest student is 16 and the oldest is 75 we can split it into 60 buckets
  - Bucket 1 contains the number of students aged 16
  - Bucket 2 the 17 yr olds
  - ...

- Matlab has a function called histogram to do this

fplot

- If we want to plot a function and are too lazy to create two arrays, we can let Matlab do it for us
  - fplot('sin(x)',[-pi,pi])
- We can specify line color, style etc like plot
- We can specify ranges (limits) in both x and y
- Easy alternative to creating vectors

hold on, hold off

- After a plot we can ask Matlab to hold on
  - Next plot will not overwrite the current one
- We then plot a few more functions
- Then issue hold off
- See paraplot.m

Xlabel, ylabel, title, etc

- Lots of ways to decorate our graphs
- Also have semilogx, semilogy, loglog, errorbar
- Etc etc...