

Matlab 3

Graphs and functions

Project C

- If you haven't started yet, I'm worried about you finishing.

Today

- Cool graph features
 - Fill
 - More on plot
 - “hold”
- Functions
 - Inputs
 - Outputs
 - “error”
 - subfunctions

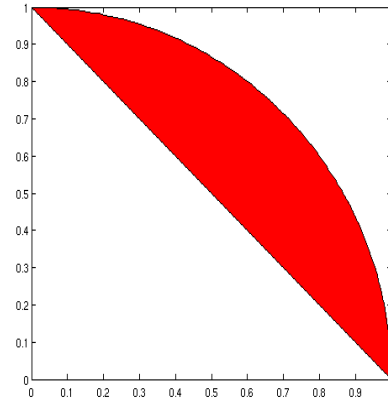
Fill

- FILL(X,Y,C)
 - fills the 2-D polygon defined by vectors X and Y with the color specified by C. The vertices of the polygon are specified by pairs of components of X and Y. If necessary, the polygon is closed by connecting the last vertex to the first.

Fill a quarter circle

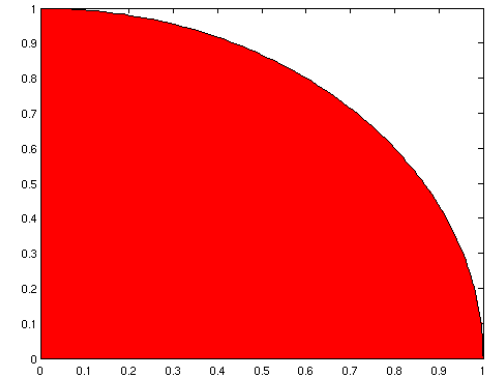
- Might try:

```
t=linspace(0,pi/2,101);  
x=sin(t);  
y=cos(t);  
fill(x,y,'r')
```
- But we get:



Fixed?

```
t=linspace(0,pi/2,  
101);  
x=sin(t);  
y=cos(t);  
x(102)=0;  
y(102)=0;  
fill(x,y,'r')
```



Now let's find Pi

- (see code)

Functions

- Matlab actually supports 3 kinds of functions:
 - Mfile, inline, and anonymous
 - Inline is no longer used (think “old school”)
 - Anonymous functions are a way of defining a variable to be a function.
- Most common is “mfile” type.
 - So we will focus on that.

Mfile Functions

- Function must be in a file with the same name as the function
 - So a function named “mdist” must be in “mdist.m”
- **First** line must be function declaration
 - “**function d=mdist(x,y)**”
- Misc facts:
 - “nargin” is the number of input arguments.
 - The function “error” prints a message and causes the program to crash.

subfunctions

- You can have more functions in a mfile function (but not an mfile script!)
 - These are only useable by the main function or other functions in the same file
 - Think of them as being “private”

Data types

- Inputs don’t change
 - What happens in the function stays in the function.
- Return value can be an array
 - So we can get back more than one value.
- Can use global or persistent variables
 - Globals are shared.
 - Persistent values keep their value between function calls.

Examples

- See matlab code