

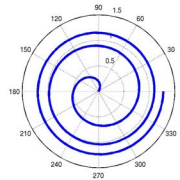


Outline

- Announcements
 - Homework I due TODAY. 5PM by e-mail
 - Homework II on web
 - No lecture on Friday
- Polar Exploration
- Patches in 2D--pcolor
- Example: NWtopex
- Survey

Polar Exploration

- The mystery: how can you produce objects without handles?

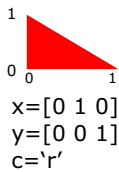


Polar Exploration

- toolbox/matlab/graph2d/polar.m
- polar creates a patch (white circle), lines (circular grid, spokes), and text
- the 'HandleVisibility' is set to 'off'-- making them inaccessible
- Gus Lott wins the Polar Explorer award for finding this out

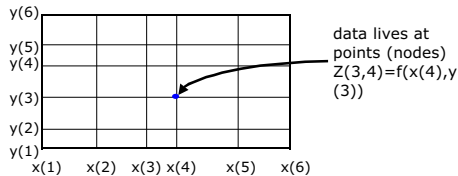
Patch Review

- Patches are our workhorse 2D objects
- Lots of functions produce patches
- patch is the lowest level functioned (followed closely by fill)
 - patch(x,y,c)--x and y specify vertex coordinates, c controls the color
 - patch(X,Y,C)--Each column of X, Y, and C is a separate patch



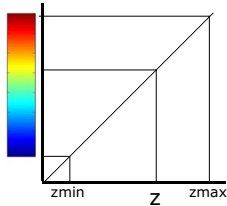
Patches and data

- We're moving from $y=f(x)$ to $z=f(x,y)$
- Typically, x & y are defined on a grid of points:



Colorizing z

- A standard way of representing 2D data is to make color indicate z



pcolor

- `pcolor(x,y,Z)` will colorize Z on grid defined by x and y
 - $Z=m-by-n$, $x=1-by-n$, $y=m-by-1$
- `pcolor(X,Y,Z)` will colorize Z on an irregular grid
 - X,Y, and Z all m-by-n
- `h=pcolor(...)` gets the handle.
 - The object is actually a surface object
 - surface objects are nearly identical to patches

How it works

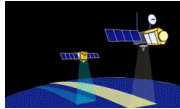
- `h=pcolor(eye(3));`
 - shading('faceted')
color of cell is set by lower left-hand corner
 - shading('flat')
edgecolor='none'
 - shading('interp')
interpolates between vertices to get color

Controlling pcolor

- shading(str) sets 'facecolor' property to str
 - flat, faceted or interp
- colorbar shows a colorbar
- caxis([zmin, zmax]) controls the color limits
 - same as set(gca,'clim',[zmin, zmax])
- colormap(cmap)--changes the colors. help graph3d lists the built in colormaps
 - we'll learn how to "role-your-own"

Example: NWtopex

- Since water flows down hill, sea-surface height (SSH) indicates currents
- The TOPEX/Poseidon satellite measures SSH with radar



NWtopex

- load(NWtopex)--loads NWtopex.mat which contains the following arrays:

name	size	description
lon	1-by-66	longitude (x)
lat	1-by-31	latitude (y)
SSH	31-by-66	SSH=z(x,y)
rkb	256-by-3	new colormap
