Data: Reading, Analyzing, Plotting
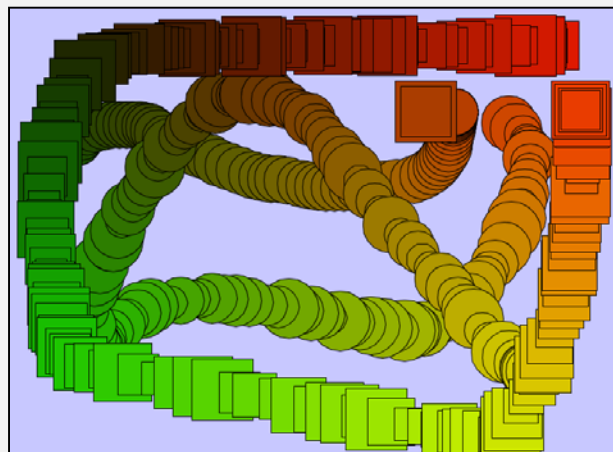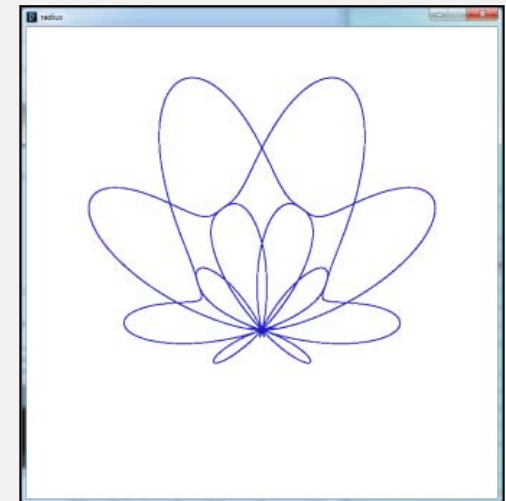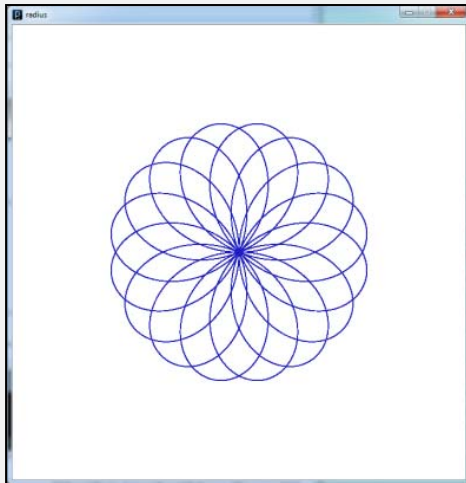

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Reading from a File, I

Everything is done in setup( ) because it only needs to happen once

```
void
setup( )
{
  size( 800, 800 );
  noFill( );

  String [  ] lines = loadStrings( "data.txt" );
  if( lines == null )
  {
    println( "Cannot open data.txt" );
    exit( );
  }

  int numPoints = int( lines[0] );;
  println( "numPoints = "  +  numPoints );
```

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Reading from a File, II

Everything is done in setup( ) because it only needs to happen once

```
float [  ] x = new float [ numPoints ];
float [  ] y = new float [ numPoints ];
for( int i = 0; i < numPoints; i = i + 1 )
{
  y[ i ] = int( lines[i+1] );
  println( "y[" + i + "] = "  +  y[ i ] );
}
```

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Reading from a File, III

Everything is done in setup( ) because it only needs to happen once

```
float sum = 0.;
for( int i = 0; i < numPoints; i = i + 1 )
{
  sum = sum + y[ i ];
}
float average = sum / float(numPoints);
println( "average = "  +  average );


sum = 0.;
for( int i = 0; i < numPoints; i = i + 1 )
{
  float diff = y[ i ] - average;
  sum = sum + ( diff * diff );
}
float stdev = sqrt(   sum / float(numPoints - 1)   );
println( "stdev = "  +  stdev );
```

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Reading from a File, IV

Everything is done in setup( ) because it only needs to happen once

```
float ymin  =  y[ 0 ];
float ymax  = y[ 0 ];
for( int i = 1; i < numPoints; i = i + 1 )
{
  if( y[ i ] < ymin )
    ymin = y[ i ];
  if( y[ i ] > ymax )
    ymax = y[ i ];
}

float xscale = float(width)   / float(numPoints - 1);
float yscale = float(height) / ( ymax - ymin );

background( 200, 255, 200 );
stroke(   0,   0, 255 );
strokeWeight( 3 );

beginShape( );
for( int i = 0; i < numPoints; i = i + 1 )
{
  vertex(  xscale * float( i ),   height - yscale * ( y[ i ] - ymin ) );
}
endShape( );
}
```

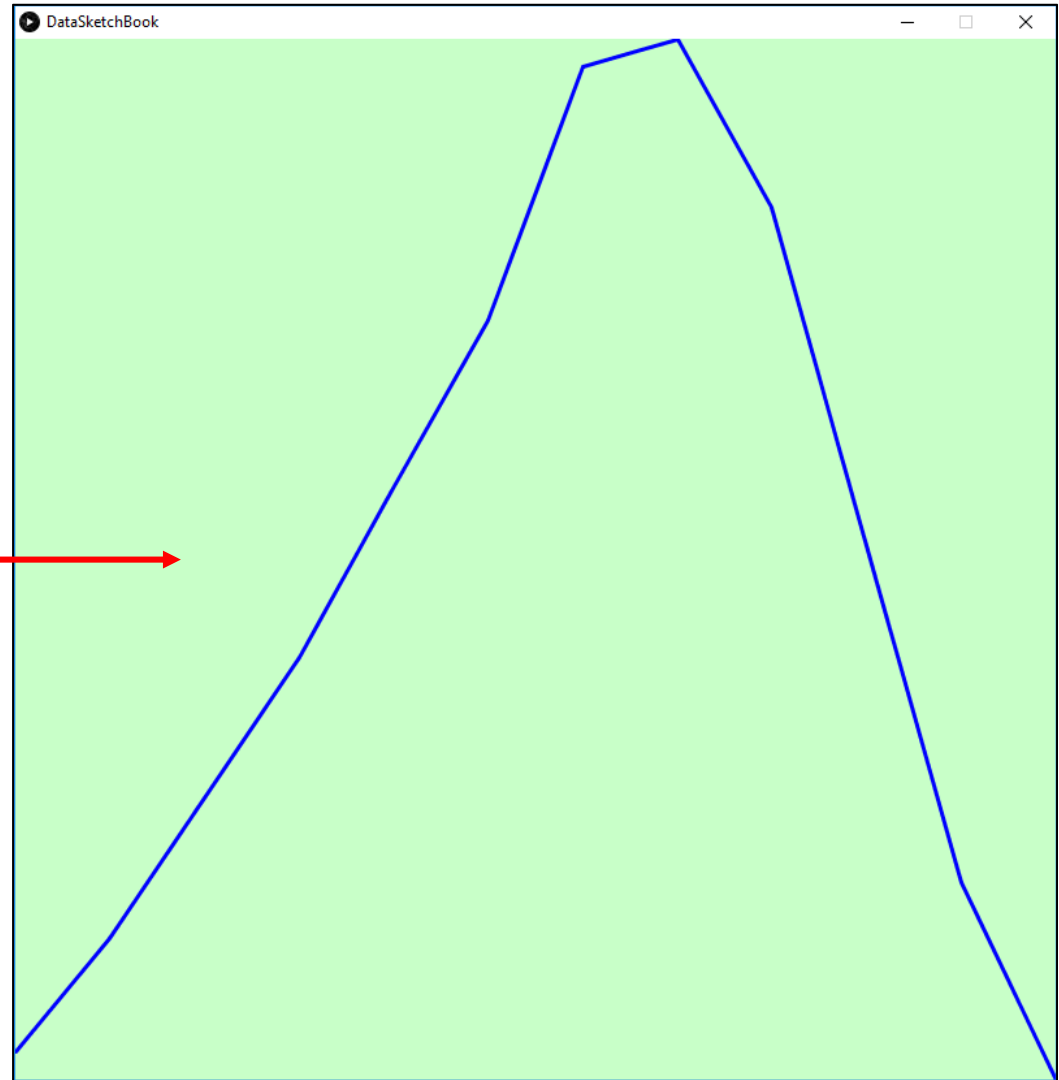Find the minimum and maximum values so we know how to scale the vertical part of the graph

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mjb – February 21, 2019

Reading from a File, V

The Data File:

12 ← Number of Points

47.
51.
56.
61.
67.
73.
82. ← Average monthly
83.   temperatures in
77.   Corvallis
65.
53.
46.

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Challenge question:
How could you draw little circles at each data point?