Comments are in boldface.  Do not type these into your xlisp session.

Summary statistics:  health club/ sit up data

Define a histogram of weights named hweight

```
> (def hweight (histogram weight))
HWEIGHT
```

Change the number of bins  by sending a message to hweight

```
> (send hweight :num-bins 10)
10
> (send hweight :num-bins 1)
1
> (send hweight :num-bins 19)
19
> (send hweight :num-bins 6)
6
```

define a new histogram named hwt

```
> (def hwt (histogram weight))
HWT
```

look at a slide show of histograms of all possible bin widths

```
> (dotimes (i (length weight))
          (send hwt :num-bins i)
          (pause 10))
NIL
```

create a "slider" that allows bin-widths to be changed

```
> (defun change-hist (nbins)
   (send hwt :num-bins nbins))
CHANGE-HIST
> (sequence-slider-dialog (iseq 1 19) :action #'change-hist)
```

make histograms of each variable

```
> (histogram waist)
> (histogram situps)
```

Make boxplots

```
> (boxplot waist)
> (boxplot weight)
> (boxplot situps)
> (plot-opints height weight)
```

make scatterplots

```
> (plot-points weight waist)
#<Object: 3fa8aa8, prototype = SCATTERPLOT-PROTO>
> (plot-points weight situps)
#<Object: 4049fa8, prototype = SCATTERPLOT-PROTO>
> (plot-points waist situps)
#<Object: 4064278, prototype = SCATTERPLOT-PROTO>
```

Make a normal-quantile plot

```
> (let ((ranks (rank weight)))
    (setf nq (normal-quant (/ (+ ranks 1) 19))))
Error: probability not strictly between 0 and 1
Happened in: #<Subr: #3eff478>
```

oops

```
> (let ((ranks (rank weight)))
    (setf nq (normal-quant (/ (+ ranks 1) 20))))
(0.6744897501960817 0.3853204664075676 0.8416212335729144 -0.5244005127080408
0.5244005127080407 0.2533471031357998 1.6448536269514715 -0.2533471031357998 0.0 -
1.2815515655446006 -0.125661346855074 -0.3853204664075676 -1.0364333894937894
1.0364333894937894 1.2815515655446006 0.12566134685507413 -0.6744897501960817 -
0.8416212335729142 -1.6448536269514722)
> nq
(0.6744897501960817 0.3853204664075676 0.8416212335729144 -0.5244005127080408
0.5244005127080407 0.2533471031357998 1.6448536269514715 -0.2533471031357998 0.0 -
1.2815515655446006 -0.125661346855074 -0.3853204664075676 -1.0364333894937894
1.0364333894937894 1.2815515655446006 0.12566134685507413 -0.6744897501960817 -
0.8416212335729142 -1.6448536269514722)
> (plot-points nq weight)
#<Object: 3f75ec8, prototype = SCATTERPLOT-PROTO>
> (rank weight)
(14 12 15 5 13 11 18 7 9 1 8 6 2 16 17 10 4 3 0)
> (normal-quant .5)
0.0
> (normal-quant .25)
-0.6744897501960817
> (normal-quant 0)
Error: probability not strictly between 0 and 1
Happened in: #<Subr-NORMAL-QUANT: #3b3ccc8>
> (normal-quant 1)
Error: probability not strictly between 0 and 1
Happened in: #<Subr-NORMAL-QUANT: #3b3ccc8>
```

another, perhaps more straight-forward, way of making the plot

```
> (def nq (normal-quant (/ (+ (rank waist) 1) 20)))
NQ
> (plot-points waist nq)
#<Object: 3eec4a8, prototype = SCATTERPLOT-PROTO>
> (def nq2 (normal-quant (/ (+ (rank situps) 1) 20)))
NQ2
> (plot-points situps nq2)
#<Object: 3f3d178, prototype = SCATTERPLOT-PROTO>
```

make a spinplot of all three variables

```
> (spin-plot (list waist weight situps))
#<Object: 4058ca8, prototype = SPIN-PROTO>
```

```
>
Some summary statistics
> (mean waist)
34.8421052631579
> (standard-deviation waist)
2.061907366567202
> (median waist)
35
> (correlation waist weight)
0.7427015857029075
```