

36-315: Statistical Graphics and Visualization

Lab 8

Date: March 4, 2003

Due: end of lab

Interspersed throughout this lab are some useful thought questions. You will be asked about them at check-off.

1. Download the files for this lab from the course web page.
2. Open a Word document to record your work.

Start R

3. Start -> Programs -> Class software -> R 1.5.1
4. Set the working directory to My Documents:

File -> Change dir...

5. Load the special functions for this lab:

```
source("lab8.r")
```

Load the data

6. `frame = read.csv("lab8.csv")`

`frame` contains three census variables, measured for each census tract in Pennsylvania:

PCI	Per-capita income
PCTFEMHE	Percent of households which are female-headed
POPPSQMI	Population per square mile

Three-dimensional plots

7. Using `predict.plot`, make pairwise scatterplots that predict income. In this following plots, use a log transformation on PCI and POPPSQMI and square root (`sqrt`) on PCTFEMHE. Make the points half size and size the window to give a reasonable aspect ratio. *Notice the outliers in the upper right of PCI versus POPPSQMI.*
8. Make a still three-dimensional plot with PCI (in this case untransformed) as height. *Compare to the version with lines drawn to the floor. Can you locate the mentioned outliers?*
9. Make an interactive three-dimensional display with the transformed variables. *Locate the mentioned outliers. Where are they with respect to PCTFEMHE? Is their value of PCTFEMHE unusual?*

Other three-dimension plots

10. Make a bubble plot with (transformed) PCI as the vertical axis, POPPSQMI horizontal, and PCTFEMHE the bubbled variable. It should look like your original scatterplot but with varying sizes. *Does this plot help you answer the previous question?*
11. Make a color plot with PCI as the coloring variable and symbols at half size. *How does income vary with population density when PCTFEMHE is held fixed? It is different from the trend in the pairwise scatterplot. Can you explain why? (Exploring the display in step 9 may be helpful.)*
12. Show us your graphs.