Instructions: There are ten questions so you have no more than 5 minutes for each one.
Each question is usually looking for one idea – save time by not including every possible
detail! Think for 3 minutes, write for 1 minute, and reflect for 1 minute to check.

1. Based on Fig 4.1 (p 180) alone, what levels of Tensile Strength and Hardness would
tend to provide a relatively small amount of abrasion loss? Provide numerical guidelines
in your answer.

2. Here is a matrix plot of the LifeCycleSavings data described in the notes for Oct 24.
What features of the data set observable in this matrix plot would influence your
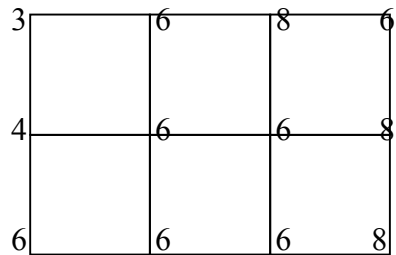subsequent analysis strategies?   (Just a couple of obvious things!)
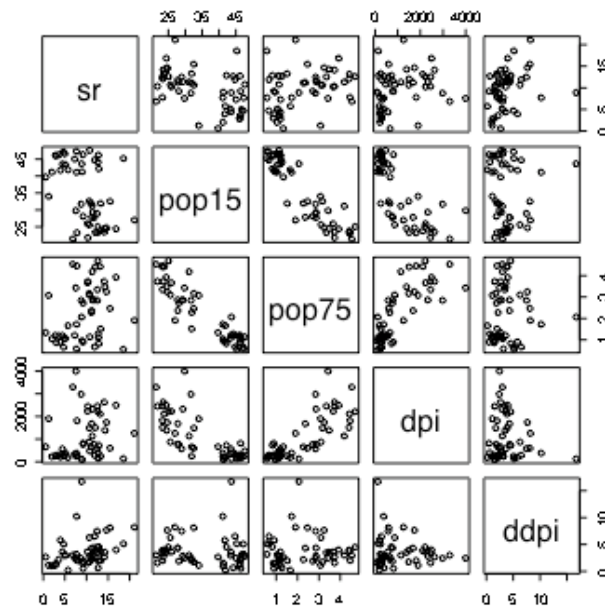
3. In ch 4, some coplots show data points in them and some do not.
Why?

4. The parametric analysis of the ethanol data (the one I posted and
discussed in class) results in a statistically significant interaction
term with a negative coefficient. Explain why this would be expected
from an examination of Fig 4.6.

5. Figure 4.13 shows the relationship of NOX to ER for various CR
values. One of the CR values used is 10.2, and yet there are no
engines with this value of CR. Should we "crop" Fig 4.13 to only
include the panels for CR values that are present in the data set?

6. Why does Cleveland recommend cropping of the Abrasion Loss surface for the coplots on p 203?

7. How does Figure 4.50 (p 239) relate to Figure 4.55 (p 247)

8. For the grid values shown here, draw the estimated contour lines at levels 5 and 7. (Copy the grid to your answer sheet – freehand is OK).

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9. The galaxy data is portrayed with a level plot, while the ethanol and rubber data sets use the coplot. Why were these methods chosen for these particular applications? (i.e. what is different about the galaxy data set compared to the other two. Note that I am **not** asking for the difference between a coplot and a level plot.)

10. Cleveland talks about Direct Manipulation in almost every chapter. What does he mean by this term? Which of Fig 4.50 (p 239) and Fig 4.58 (p 251) would be enhanced by Direct Manipulation?