STAT 100   Chance and Data Analysis

web site www.stat.sfu.ca/~weldon/stat100-02-3.html

Tanur book is backround to several topics, but not all – lectures notes necessary.

Basics: Unexplained variation
     Ex: Weigh scale
       Gas mileage?

Fig. 1 Loess Smooth of Gasoline Consumption Data
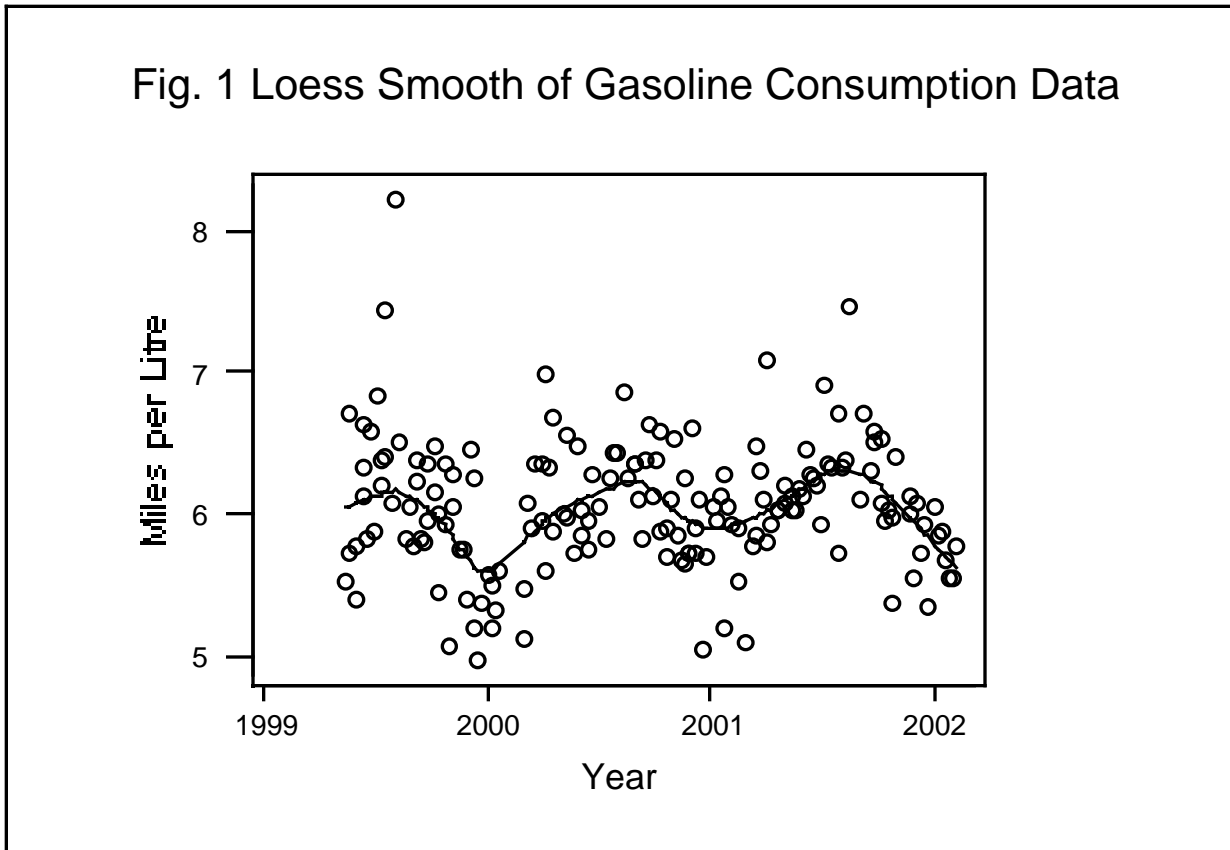
What is reason for seasonal pattern? Temp, wet road, or traffic?
   Hard to separate wet road from traffic. Will collect data ….

Important tools:
Data Analysis - graphing data - mention Cleveland "Visualizing Data
Probability - simulation - simple way to examine random systems

Example of simulation Use: Sports Leagues: soccer, field hockey, ice hockey, Bball etc
England standings and scores

English league standings

Premier | Division One

```
                         GP   W   D   L   F   A  Pts
1.  Leeds United        11   6   5   0  15   5  23
2.  Liverpool           10   7   1   2  20  10  22
3.  Aston Villa         11   6   3   2  17  11  21
4.  Newcastle United    11   6   2   3  21  14  20
5.  Arsenal             11   5   4   2  24  13  19
6.  Manchester United   11   5   3   3  28  20  18
7.  Chelsea             11   4   6   1  16  11  18
8.  Blackburn Rovers    12   4   5   3  20  15  17
9.  Tottenham Hotspur   12   5   2   5  19  17  17
10. Bolton Wanderers    12   4   4   4  16  16  16
11. Everton             11   4   3   4  18  17  15
12. Fulham              11   3   5   3  12  12  14
13. Middlesbrough       12   4   2   6  16  20  14
14. West Ham United     11   4   2   5  12  21  14
15. Charlton Athletic   11   3   4   4  12  13  13
16. Sunderland          12   3   4   5  10  14  13
17. Leicester City      12   2   3   7   7  23   9
18. Ipswich Town        12   1   5   6  13  20   8
19. Southampton         11   2   1   8  10  21   7
20. Derby County        11   1   4   6   9  22   7
```

Home team listed first
Is there such a thing as "team quality" - tendency to win?
    Is advancing the top 4 teams to the playoffs a good way to find the best team?

Simulation (tossing a fair coin): to examine if there is team "quality"

For homework:
Using coin tosses, simulate a league's season with 5 teams each playing each other 2 times (once home and once away say). This will involve a total of (2 times 5C2/2) = 20 games. Allow 3 points for a win and 0 points for a loss - assume no ties. Do all teams have about the same number of points for the season?