Today: Brief coverage of pp 42-86 – transformations, r-f plots
   Mercedes Data Exercise

2.6 Log transformations: Quantile indication for it p 45
          Normal Q-Q plot indication for it p 46
          Example of monotone spread (another indication) p47
          Graph of Monotone Spread p 50 and after log p 51
          Detection of Multiplicative Shifts (Additive in Log)
          r-f Plot for the transformed stereogram data p 55
2.7 Power Transformations Log is power 0
          square root (power 1/2) not as strong in reducing skew right
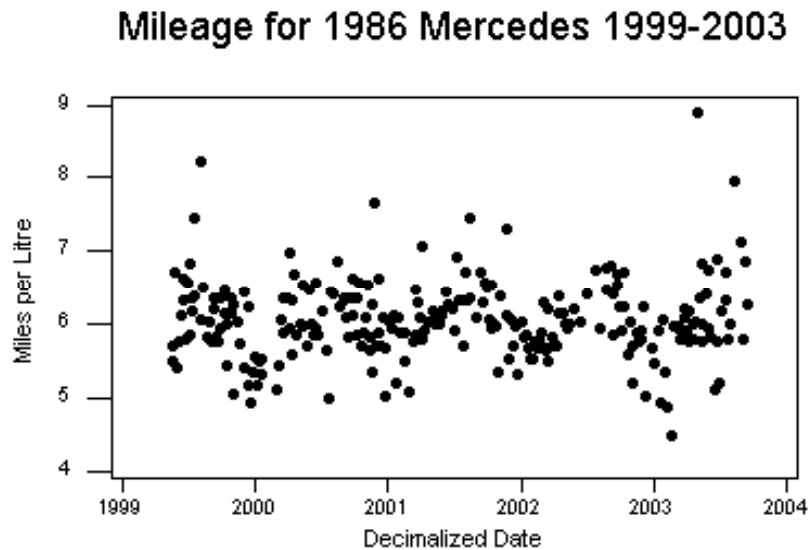   reciprocal (power –1) is stronger

2.8-2.10 Scan for ideas.

Mercedes Data:
Real Data - Most recent observation today!
m/l is miles per liter
is a time series
data is at the end of these notes

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Mileage for 1986 Mercedes 1999-2003

Questions of Interest:

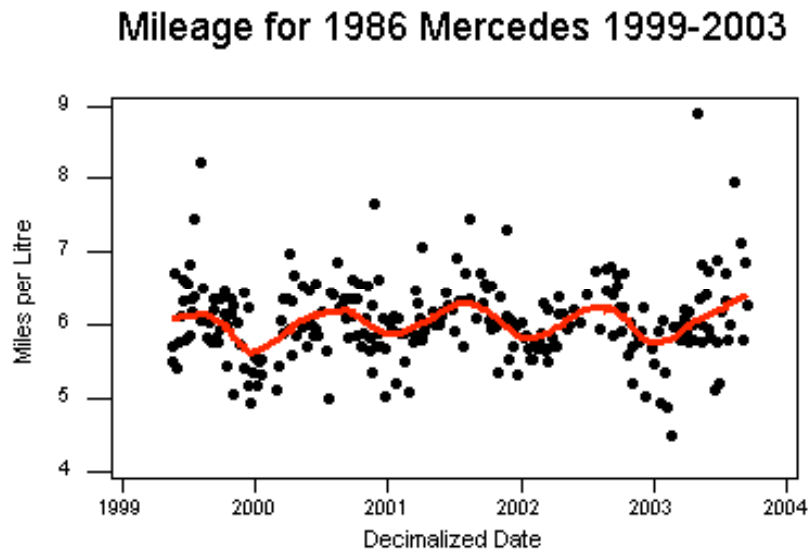Can any of the variation be given a simple explanation?
Are there periods of unusual mileage? (Could this be used to monitor "health")
Does the data series help to forecast the next few values? (Why would this be useful?)

Procedures to try: Fit + Residual
What fit? Moving Average? What order? End truncation?
A new method called Loess (or Lowess in MINITAB) produces this

Mileage for 1986 Mercedes 1999-2003

Loess is described in Ch 3. Important that you know the details of this. P 95 is helpful.

Exercise for next Wednesday: 1. Make a graph like the above with loess on the Mercedes data. 2. Forecast the next three points. Assume an average interval between fills is .02 years. 3. Comment on your choices in 1. and 2.

Start reading Ch 3.

Mercedes Data.

Row	m/l	date
1	5.51867	1999.37
2	5.70842	1999.38
3	6.70823	1999.39
4	5.40373	1999.41
5	5.76065	1999.42
6	6.11628	1999.44
7	6.32035	1999.45
8	6.64286	1999.46
9	5.81699	1999.47
10	6.57952	1999.49

11	5.86354	1999.50
12	6.82620	1999.51
13	6.18938	1999.52
14	6.37333	1999.53
15	6.39830	1999.54
16	7.44792	1999.54
17	6.07527	1999.58
18	6.51064	1999.60
19	5.83333	1999.64
20	6.04779	1999.66
21	8.22785	1999.59
22	5.77878	1999.67
23	6.22768	1999.68
24	6.37394	1999.69
25	5.83133	1999.71
26	5.78652	1999.72
27	6.35081	1999.73
28	5.94650	1999.74
29	6.47186	1999.76
30	6.16016	1999.77
31	5.45249	1999.78
32	5.99585	1999.79
33	6.35052	1999.81
34	6.17021	1999.82
35	5.05695	1999.84
36	6.26794	1999.84
37	6.04119	1999.86
38	5.73737	1999.88
39	5.73503	1999.89
40	5.40426	1999.91
41	6.46465	1999.92
42	5.17752	1999.94
43	6.25624	1999.95
44	4.95913	1999.96
45	5.37255	1999.98
46	5.56086	2000.00
47	5.18145	2000.02
48	5.50000	2000.03
49	5.31780	2000.04
50	5.54639	2000.05

51	5.12039	2000.16
52	5.45894	2000.17
53	6.07375	2000.19
54	5.88865	2000.21
55	6.35628	2000.21
56	6.36175	2000.24
57	5.94037	2000.25
58	6.99266	2000.26
59	5.58882	2000.27
60	6.32780	2000.28
61	6.68724	2000.29
62	5.86998	2000.31
63	6.00798	2000.34
64	5.97959	2000.36
65	6.55602	2000.36
66	5.72301	2000.39
67	6.49160	2000.40
68	6.01610	2000.42
69	5.85052	2000.43
70	5.95483	2000.45
71	6.57143	2000.46
72	5.87500	2000.47
73	6.19137	2000.51
74	5.64486	2000.54
75	5.00000	2000.56
76	6.44022	2000.57
77	6.42570	2000.59
78	6.85714	2000.62
79	6.25000	2000.63
80	6.34091	2000.67
81	6.35417	2000.67
82	6.10417	2000.68
83	5.82278	2000.70
84	6.37778	2000.71
85	6.64000	2000.73
86	6.13725	2000.74
87	6.37255	2000.76
88	5.86345	2000.77
89	6.58462	2000.78
90	5.70825	2000.80

91	5.89633	2000.81
92	6.09804	2000.83
93	6.52807	2000.84
94	5.83838	2000.86
95	5.66724	2000.87
96	6.26062	2000.88
97	5.34759	2000.88
98	7.66000	2000.90
99	5.71843	2000.91
100	6.61538	2000.92
101	5.89958	2000.93
102	5.72368	2000.94
103	6.10548	2000.96
104	5.03597	2000.97
105	5.69536	2000.98
106	6.04819	2001.01
107	5.95181	2001.03
108	6.12245	2001.04
109	5.20000	2001.06
110	6.09195	2001.07
111	6.08392	2001.08
112	5.88621	2001.09
113	5.51923	2001.12
114	5.89286	2001.13
115	5.08130	2001.16
116	5.77731	2001.19
117	5.84942	2001.20
118	6.47969	2001.21
119	6.30189	2001.23
120	6.10619	2001.24
121	5.80495	2001.26
122	7.08333	2001.26
123	5.92875	2001.27
124	6.03604	2001.30
125	6.02510	2001.31
126	6.20123	2001.33
127	6.07261	2001.34
128	6.02020	2001.36
129	6.11549	2001.36
130	6.02317	2001.38

131	6.18000	2001.40
132	6.12766	2001.41
133	6.46209	2001.43
134	6.28283	2001.45
135	6.24490	2001.46
136	6.20968	2001.48
137	5.91837	2001.50
138	6.91610	2001.51
139	6.34387	2001.53
140	6.32653	2001.55
141	5.70833	2001.57
142	6.71642	2001.58
143	6.33858	2001.59
144	6.37195	2001.61
145	7.46575	2001.62
146	6.10306	2001.67
147	6.70707	2001.69
148	6.31343	2001.72
149	6.56992	2001.73
150	6.50990	2001.74
151	6.07516	2001.76
152	6.53846	2001.77
153	5.95960	2001.78
154	6.01227	2001.80
155	5.98109	2001.81
156	5.37129	2001.82
157	6.40082	2001.84
158	6.12335	2001.89
159	7.32283	2001.90
160	5.53611	2001.91
161	6.06811	2001.92
162	5.72839	2001.94
163	5.98592	2001.96
164	5.34351	2001.98
165	6.05333	2002.01
166	5.84521	2002.02
167	5.87084	2002.04
168	5.67850	2002.06
169	5.54902	2002.07
170	5.53377	2002.09

171	5.77963	2002.10
172	5.69231	2002.12
173	5.78947	2002.14
174	5.71429	2002.15
175	5.89362	2002.16
176	6.30363	2002.17
177	5.65728	2002.19
178	6.22596	2002.20
179	5.50209	2002.21
180	5.83673	2002.24
181	5.72025	2002.24
182	5.72781	2002.27
183	6.16162	2002.28
184	6.39013	2002.29
185	6.15280	2002.31
186	5.94262	2002.35
187	6.01580	2002.37
188	6.21160	2002.40
189	6.00437	2002.34
190	6.02637	2002.44
191	6.40979	2002.50
192	6.74359	2002.56
193	5.94705	2002.60
194	6.48688	2002.64
195	6.78350	2002.65
196	6.79287	2002.67
197	6.43110	2002.69
198	5.85216	2002.70
199	6.55257	2002.72
200	6.67857	2002.72
201	6.23239	2002.74
202	5.92075	2002.76
203	6.25616	2002.77
204	6.72014	2002.78
205	5.59036	2002.80
206	6.04488	2002.82
207	5.20807	2002.84
208	5.70667	2002.84
209	5.88551	2002.87
210	5.77720	2002.89

211	5.79710	2002.90
212	5.91362	2002.91
213	6.23431	2002.92
214	5.03521	2002.93
215	5.67500	2002.99
216	5.48387	2003.01
217	5.91241	2003.04
218	4.94867	2003.05
219	6.08081	2003.07
220	5.35211	2003.08
221	4.89022	2003.10
222	4.48765	2003.13
223	5.98113	2003.15
224	5.97959	2003.18
225	5.95833	2003.19
226	5.79381	2003.20
227	5.87035	2003.22
228	6.09709	2003.23
229	6.20690	2003.24
230	5.92030	2003.25
231	6.18518	2003.26
232	5.77566	2003.27
233	5.81439	2003.29
234	6.01695	2003.30
235	6.03175	2003.32
236	8.89145	2003.33
237	6.36905	2003.34
238	5.99613	2003.36
239	6.85106	2003.36
240	5.78723	2003.37
241	6.42553	2003.39
242	5.96045	2003.41
243	6.75105	2003.42
244	5.82418	2003.43
245	5.13575	2003.46
246	5.78049	2003.47
247	6.88679	2003.48
248	5.20776	2003.49
249	6.17486	2003.51
250	6.72598	2003.54

251	6.33641	2003.55
252	5.80769	2003.56
253	6.00660	2003.58
254	7.96875	2003.61
255	7.12658	2003.65
256	5.80448	2003.67
257	6.85654	2003.69
258	6.28680	2003.70