**Question 7.1**

*Describe a situation or problem from your job, everyday life, current events, etc., for which exponential smoothing would be appropriate. What data would you need? Would you expect the value of α (the first smoothing parameter) to be closer to 0 or 1, and why?*

Here’s one possible situation.

An automobile manufacturer might want to study the effect of preventive engine maintenance on gas mileage. Every car in the study is driven the same distance on the same indoor road course (to eliminate temperature effects) each day. For every car in the study, the car’s fuel efficiency is recorded every week. Some cars receive preventive maintenance every 6 weeks, some every 10 weeks, and some every 14 weeks.

For each car, the manufacturer could build an exponential smoothing model, with weekly gas mileage as the values being studied. It would include cyclic effects (a cycle would be 6 weeks, 10 weeks, or 14 weeks, depending on the maintenance interval for the car), and the trend would help show how quickly gas mileage deteriorates over time.

I’m not a car expert, but I would expect that there wouldn’t be too much variability in gas mileage from week to week for the same car (other than trend and cyclic effects). So, I’d expect the value of α to be closer to 1.