**Question 1**

Barbara Herdman is the manager of the marketing research department of J.E. Hall, Inc. She recently collected demand data for the last six years of a special product and then asked one of her associates, Mr. Brown, to forecast the data for the same past six years using the sales force composite method. The following data provide the details for Mr. Brown’s forecast:

|  |  |  |
| --- | --- | --- |
| **Year** | **Actual demand** | **Mr. Brown’s forecast** |
| 1 | 490 | 492 |
| 2 | 510 | 503 |
| 3 | 535 | 512 |
| 4 | 560 | 578 |
| 5 | 590 | 580 |
| 6 | 630 | 620 |

**Complete the following:**

1. Forecast the demand for the seventh year using the exponential smoothing method with alpha = 0.4. Show all details clearly. Use the initial forecast for the first year (492).
2. Which of the above methods is more accurate using mean absolute deviation (MAD) criteria?
3. Barbara performed a regression analysis on the six-year data and established the following equation:  
     
   Demand = 456 + 28x(*t*) where *t* is the code for the year (*t* = 1, 2, 3, 4, 5, or 6)  
     
   Forecast the demand for the seventh year using Barbara’s equation above.

**Question 2**

During registration at a university, students have their courses approved by the adviser. It takes the adviser an average of 2.8 minutes (exponentially distributed) to approve each schedule, and students arrive at the adviser’s office at the rate of 20 per hour (Poisson distributed).

**Complete the following:**

1. Compute the average time a student spends in the waiting line.

The registrar has received complaints from students about the length of time they must wait to have their schedules approved. The registrar is considering several ways to reduce the waiting time.

1. One way to reduce the waiting time is to assign some assistants to the adviser. Each such assistant would reduce the average time required to approve a schedule by 0.2 minutes, down to a minimum of 1.0 minutes. If this option is followed, how many assistants should the registrar assign to the adviser if he feels that a waiting time of 10 minutes is not unreasonable?
2. It has been noted that about one-fifth of the students fall under routine cases which they can themselves identify as routine. These routine cases take 1 minute to be served with negligible variance. Hence, one other way to reduce the waiting time is to provide an assistant who handles routine cases, while non-routine cases are handled by the adviser. Will this option be acceptable?
3. Yet another way is to provide additional advisers. Assuming that the average service time for each adviser is the same, how many advisers will be needed to bring the waiting time to 10 minutes or less?

**Question 3**

**Complete the following:**

Which three of Deming’s 14 points do you feel are the most critical to the success of a total quality management (TQM) programme? Why?

**Question 4**

The purpose of this simulation project is to provide you with an opportunity to use the *POM-QM for Windows* software to solve a forecasting problem.

*POM-QM for Windows* software

For this part of this project, you will need to use the *POM-QM for Windows* software:

1. Read Appendix IV of the *Operations Management* (Heizer & Render, 2011) textbook.
2. Launch the *POM-QM for Windows* software and from the main menu select Module, and then Forecasting.
3. Next, select File, New, and Least Squares - Simple and Multiple regression.

Use the forecasting module that you opened in the *POM-QM for Windows* software to solve the case study on page 146 of the Heizer and Render (2011) textbook (Southwestern University). For this case study, you are required to build a forecasting model. Assume a linear regression forecasting model and build a model for each of the five games (five models in total) by using the forecasting module of the POM software.

Answer the three discussion questions for the case study, except the part requiring you to justify the forecasting as linear regression would be used.

**Case Studies**  **Southwestern University: (C)\***

The popularity of Southwestern University’s football program under its new coach, Bo Pitterno, surged in each of the 5 years since his arrival at the Stephenville, Texas, college. (See Southwestern University: (A) in Chapter 3 and (B) in Chapter 4.) With a football stadium close to maxing out at 54,000 seats and a vocal coach pushing for a new stadium, SWU president Joel Wisner faced some difficult decisions. After a phenomenal upset victory over its archrival, the University of Texas, at the homecoming game in the fall, Dr. Wisner was not as happy as one would think. Instead of ecstatic alumni, students, and faculty, all Wisner heard were complaints. “The lines at the concession stands were too long”; “Parking was harder to find and farther away than in the old days” (that is, before the team won regularly); “Seats weren’t comfortable”; “Traffic was backed up halfway to Dallas”; and on and on. “A college president just can’t win,” muttered Wisner to himself.

At his staff meeting the following Monday, Wisner turned to his VP of administration, Leslie Gardner. “I wish you would take care of these football complaints, Leslie,” he said. “See what the *real* problems are and let me know how you’ve resolved them.” Gardner wasn’t surprised at the request. “I’ve already got a handle on it, Joel,” she replied. “We’ve been randomly surveying 50 fans per game for the past year to see what’s on their minds. It’s all part of my campuswide TQM effort. Let me tally things up and I’ll get back to you in a week.”

When she returned to her office, Gardner pulled out the file her assistant had compiled (see Table 6.6). “There’s a lot of information here,” she thought.

**TABLE 6.6**  **Fan Satisfaction Survey Results (N = 250)**

