Lab 1: Low Nail Company

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| **Scenario/Summary** |

After making some wise short-term investments at a race track, Chris Low had some additional cash to invest in a business. The most promising opportunity at the time was in building supplies, so Low bought a business that specialized in sales of one size of nail. The annual volume of nails was 2,000 kegs, and they were sold to retail customers in an even flow. Low was uncertain of how many nails to order at any time. Initially, only two costs concerned him: order-processing costs, which were $60 per order without regard to size, and warehousing costs, which were $1 per year per keg space. This meant that Low had to rent a constant amount of warehouse space for the year, and it had to be large enough to accommodate an entire order when it arrived. Low was not worried about maintaining safety stocks, mainly because the outward flow of goods was so even. Low bought his nails on a delivered basis.

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| **Deliverables** |

This week’s lab consists of six questions. Please be certain that you answer all of the questions and address all of the areas outlined in the grading rubric below.

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|  | **L A B  S T E P S**  |  |

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| **Step 1: Initial EOQ** |  |

**Question 1:** Using the EOQ methods outlined in Chapter 9, determine how many kegs of nails Low should order at one time.

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| **Step 2: Low-Quantity Discount** |  |

**Question 2:** Assume that all conditions in Question 1 hold, except that Low’s supplier now offers a quantity discount in the form of absorbing all or part of Low’s order-processing costs. For orders of 750 or more kegs of nails, the supplier will absorb all order-processing costs; for orders between 249 and 749 kegs, the supplier will absorb half. What is Low’s new EOQ? (It might be useful to lay out all costs in tabular form for this and later questions.)

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| **Step 3: Low Rent** |  |

**Question 3:** Temporarily ignore your work on Question 2. Assume that Low’s warehouse offers to rent Low space on the basis of the average number of kegs that Low will have in stock, rather than on the maximum number of kegs that Low would need room for whenever a new shipment arrived. The storage charge per keg remains the same. Does this change the answer to Question 1? If so, what is the new answer?

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| **Step 4: New EOQ** |  |

**Question 4:** Take into account the answer to Question 1 and the supplier’s new policy outlined in Question 2, and the warehouse’s new policy in Question 3. Then determine Low’s new EOQ.

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| **Step 5: Financing Inventory** |  |

**Question 5:** Temporarily ignore your work on Questions 2, 3, and 4. Low’s luck at the race track is over; he now must borrow money to finance his inventory of nails. Looking at the situation outlined in Question 1, assume that the wholesale cost of nails is $40 per keg and that Low must pay interest at the rate of 1.5% per month on unsold inventory. What is his new EOQ?

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| **Step 6: Final EOQ** |  |

**Question 6:** Taking into account all of the factors listed in Questions 1, 2, 3, and 5, calculate Low’s EOQ for kegs of nails.