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Risk and Logistics

Workshop 7

1 Managing Chocolate – Easter Bunnies

This question is available as a STACK quiz. I included the description here for better readability.

Easter is approaching fast and you have to decide how many of *Schoki*'s chocolate bunnies to stock. As those bunnies are a seasonal products and due to the high setup cost for re-configuring the machines, only one product run can be issued in the factory. Hence, it will not be possible to order a second time if you run out of bunnies before Easter. Looking at the sales figures from previous years, you think that it is reasonable to assume that the demand is normally distributed. Based on that you quickly compute the mean demand as $\mu_D = 1,500$ boxes of bunnies, with a standard deviation of $\sigma_D = 374$ boxes. The purchasing price for a box is £300 and selling it before Easter yields a revenue of £500. Any boxes that are not sold by Easter can be sent back to the factory, where the chocolate is re-used for other products. The factory will, however, only reimburse you 25% of the price of a box.

Question

Determine the optimal order quantity Q^* of bunnies that maximises your total profit.