B case

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Newsvendor case

Problem_1

The A/F ratio is the ratio of actual demand divided by the predicted value. As a result of O'Neill's forecast of 3.2 million swimwear sales in 20, the sales data were normally distributed, with the expected A/F ratio of 0.9976 and the standard deviation of the A/F ratio of 0.369. Given that 21 years of swimwear sales are 2.2 million and the A/F ratios are the same, and sales volume is normally distributed, obtain the expected actual demand distribution.

#sol_1

$\mu = Estimated\ A/F\ Ratio \times Demand\ forecasting = 0.9976 \times 2{,}200{,}000 = 2{,}194{,}720$
$\sigma = Standard\ deviation\ of\ A/F\ ratio \times Demand\ forecasting = 0.369 \times 2{,}200{,}000$
$= 811{,}800$
$\therefore\ expected\ actual\ demand = N(2194720{,}811800)$

Problem_2

The factory costs $110 to produce swimsuits, $180 to sell at the store and $90. Get the best order quantity using the actual demand you've got earlier.(φ(0.76)=0,7764, φ(0.77)=0.7794)

#sol_2

C_o=(Material Cost - Salvage Price)=(110-90)=$20

C_u=(Retail Price - Material Cost)=(180-110)=$70

optimal stock = smallest Y that matches F(Y) = $\frac{c_u}{c_o+c_u}$

$$F(z) = \frac{70}{70 + 20}$$

$$F(z) = \frac{7}{9} \fallingdotseq 0.7778$$

Z = (Q- μ)/ σ
$\rightarrow \therefore Best\ order\ quantity\ = Q = \mu + Z * \sigma$ = 2,194,720+0.77*811,800 = 2,819,806