**Business Process Analytics**

**Questions for the Supply Contracts at SkiRetail**

Q 1: Consider the case in which Skiekz and SkiRetail were vertically integrated and hence there are no internal transactions. What is the optimal production quantity and the expected profit for “the company”?

Q 2: Consider the current scenario where the supplier “Skiekz” and the retailer “SkiRetail” are not vertically integrated. Bergard believes that SkiRetail should place an order for a quantity that is in its best economic interest. What is your estimate of the quantity for ski jackets that Bergard (SkiRetail) shall place an order for?

1. Determine the expected profit for SkiRetail based on your estimate of order quantity.
2. Determine the expected profit for Skiekz based on estimate of order quantity.
3. Estimate is the total supply chain profit? How does this profit compare to the vertically integrated case (Q 1).

Q 3: Skiekz and SkiRetail would like to explore the option of buy-back contract, in which Skiekz would buy unsold goods from SkiRetail at an agreed upon price (referred as “buy-back price”).

1. Analyze the impact of different buy-back prices on the optimal order quantity, retailer’s expected profit, supplier’s expected profit, as well as the total supply chain profit? Show your results using some plots.
2. What is the “optimal” range of buy-back price that you would propose to the firms?
3. Determine the expected profit for the “retailer” under the proposed buy-back contract.
4. Determine the expected profit for the “supplier” under the proposed buy-back contract.

Q 4: Skiekz and SkiRetail would like to explore the option of revenue-sharing contract, in which SkiRetail is willing to share 15% of its revenues from regular sales for a reduced purchase /wholesale price.

1. Analyze the impact of varying wholesale price on the optimal order quantity, retailer’s expected profit, supplier’s expected profit, as well as the total supply chain profit? Show your results using some plots.
2. What is the optimal purchase /wholesale price that Skiekz should propose?
3. Determine the expected profit for the “retailer” under the proposed revenue-sharing contract.
4. Determine the expected profit for the “supplier” under the proposed revenue-sharing contract.

Q 5: Skiekz and SkiRetail would like to explore *optimal revenue-sharing contract(s)* that will maximize the total expected supply chain profit as opposed to their individual expected profits. The two decisions of interests are the *wholesale price* and the *proportion of primary revenue shared.* Determine the optimal combination of wholesale price and the percentage of revenue sharing agreements that will maximize the total expected supply chain profit.

Q 6: What is your recommendation to the companies: buy-back contract or revenue-sharing contract? Why? What are the potential benefits and risks associated with each?