

## **Probabilistic, Single-period Inventory Models – Learning Cases for Business Analytics**

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### **Abstract**

Single-period inventory models with uncertain demand are very well known in the business analytics community. Typically, such models are rule-based functions, or sets of functions, of one decision variable (order quantity) and one random variable (demand). In academics, the models are taught selectively. Students are exposed to applications of selected models usually within the Inventory Control or similar topics. This paper attempts to provide a fuller spectrum of models that depend on the amount and type of information about the uncertain demand. Frameworks, within which the models are developed, range from the Game Theory, through Simulation, to Calculus. Both discrete and continuous variables are explored. Student are expected to benefit from studying the models by better understanding how modeling frameworks change as a result of changing information amount and type. All models are implemented in Excel.

**Keywords:** model, optimization, probability, inventory, simulation, spreadsheet.