Remark:

Bonds and stocks are subdivided into a number of homogenous groups such as government bonds and corporate bonds. Each group is modeled separately in BondItem or StockItem.
Appendix B: BusinessLine Hierarchy

Remark:

1. Two subclasses inherit BusinessLine to handle two kinds of loss development methods respectively.

Aggregate Loss Method: Aggregate losses for a line of insurance can be based on both
frequency and severity. Severity means the average value for claims that have been, or may be, received by the insurer. This average usually is determined from the insurer’s experience on closed claims and modified as necessary by actuarial projections of future payments. For each line of insurance, this average is multiplied by loss frequency, which is the number of the claims estimated.

Loss Ratio Method: In this method, the projected loss ratio is first developed by randomly sampling from the probability distribution. Once the loss ratio is generated during a selected period, the total liability cash flows are calculated by multiplying the generated loss ratio by the forecasted earned premium and accident year payout pattern.

2. For each line of business, the underwriting loss is calculated separately in subsequent renewals in each time period. This is implemented in queue structure under AggregateLoss and RatioLoss.

3. Different types of reinsurance are implemented in different templates.
Quota Share: The percentage of premiums, losses, and policy limits shared by the primary insurer and the reinsurer is the same. The primary insurer and the reinsurer agree, in advance, to a percentage for sharing policy limits, premiums, and losses.

Aggregate Excess: An aggregate excess reinsurance treaty usually states the primary insurer’s limit as a loss ratio or an amount. When the losses exceed the limit, the primary insurer will stop paying the losses.

Finite Risk Reinsurance: All finite risk reinsurance agreements transfer a limited
amount of risk to the reinsurer, with the objective of improving the primary insurer’s financial results. A finite risk reinsurance agreement is not a distinct form of reinsurance; any type of reinsurance can be written using a finite risk reinsurance agreement.