

Pricing an Insurance Policy

Ajkana Hima
31033



What is Monte
Carlo Simulation
and Integration



Methodology



Code
demonstration



Monte Carlo simulation is a method of estimating unknown values or quantities by simulating many scenarios and aggregating the results. In contrast, Monte Carlo integration is a numerical integration approach that uses random sampling to approximate the definite integral of a function by producing random points and determining their average contribution to the integral.



Pricing an insurance policy with Monte Carlo

The simulation-based technique provides a thorough and probabilistic estimation of policy prices by taking into consideration numerous parameters such as claim amounts, claim frequencies, and deductibles.



Monte Carlo simulation is a method of estimating unknown values or quantities by simulating many scenarios and aggregating the results. In contrast, Monte Carlo integration is a numerical integration approach that uses random sampling to approximate the definite integral of a function by producing random points and determining their average contribution to the integral.



Pricing an insurance policy with Monte Carlo

Pricing an Insurance Policy

Ajkana Hima
31033



What is Monte
Carlo Simulation
and Integration



Methodology



Code
demonstration



The dataset utilized in this study comprises historical information on insurance claims. It has two important variables: claim amounts and claim frequencies.



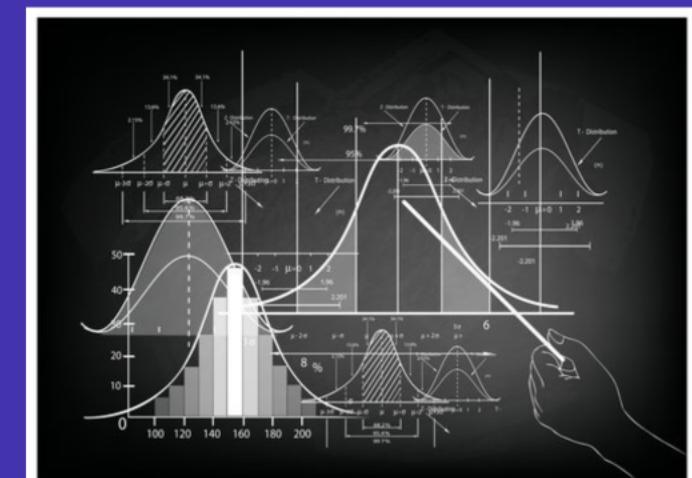
1. Claim Amounts

- The financial impact of individual insurance claims is represented
- by this variable. It keeps track of the monetary amount of each claim, indicating
- the cost incurred by the insurance company for that particular claim. Claim amounts might vary greatly based on factors such as the covered asset's nature or
- the type of coverage.



2. Claim Frequencies

- This statistic represents the number of claims filed within a specific policy period. It gives information on how frequently policyholders submit claims for reimbursement or compensation.
- Claim frequencies might vary depending on factors such as the insured asset's risk profile, insurance terms, or external factors such as environmental conditions.





The dataset utilized in this study comprises historical information on insurance claims. It has two important variables: claim amounts and claim frequencies.



Data Description

- The insurance dataset utilized in this Python program contains information about
- insurance policyholders and the healthcare bills they incur. The variables in the dataset are as follows:
- 1. Age: The age of the policyholder (numeric).
- 2. Gender: The gender of the policyholder (categorical: "female" or "male").
- 3. BMI: The body mass index of the policyholder (numeric).
- 4. NumChildren: The number of children the policyholder has (numeric).
- 5. Smoker: Indicates whether the policyholder is a smoker or not (categorical: "yes" or "no").
- 6. Region: The region where the policyholder resides (categorical: "southwest", "southeast", "northwest", or "northeast").
- 7. Charges: The healthcare charges incurred by the policyholder (numeric).

age	sex	bmi	children	smoker	region	charges
19	female	27.9	0	yes	southwest	16884.92
18	male	33.77	1	no	southeast	1725.552
28	male	33	3	no	southeast	4449.462
33	male	22.705	0	no	northwest	21984.47
32	male	28.88	0	no	northwest	3866.855
31	female	25.74	0	no	southeast	3756.622
46	female	33.44	1	no	southeast	8240.59
37	female	27.74	3	no	northwest	7281.506
37	male	29.83	2	no	northeast	6406.411





The dataset utilized in this study comprises historical information on insurance claims. It has two important variables: claim amounts and claim frequencies.



Pricing an Insurance Policy

Ajkana Hima
31033



What is Monte
Carlo Simulation
and Integration



Methodology



Code
demonstration

Perform the Monte Carlo simulation
policy_prices = []

for i in range(num_simulations):

*total_claims = claim_amounts[i] * claim_frequencies[i]*

policy_price = max(total_claims - deductible, 0)

policy_prices.append(policy_price)

Conclusion

In summary, further research and improvement in the methodology of insurance policy pricing can include exploring enhanced models, incorporating comprehensive datasets, conducting sensitivity analysis, and validating the simulation results. These efforts can lead to more accurate and reliable pricing estimates, better understanding of the factors influencing policy prices, and improved decision-making in the insurance industry.



Thank You!

Conclusion

In summary, further research and improvement in the methodology of insurance policy pricing can include exploring enhanced models, incorporating comprehensive datasets, conducting sensitivity analysis, and validating the simulation results. These efforts can lead to more accurate and reliable pricing estimates, better understanding of the factors influencing policy prices, and improved decision-making in the insurance industry.

Perform the Monte Carlo simulation
policy_prices = []

for i in range(num_simulations):

*total_claims = claim_amounts[i] * claim_frequencies[i]*

policy_price = max(total_claims - deductible, 0)

policy_prices.append(policy_price)

Pricing an Insurance Policy

Ajkana Hima
31033



What is Monte
Carlo Simulation
and Integration



Methodology



Code
demonstration