TRINITY COLLEGE FOR WOMEN NAMAKKAL
Department of Mathematics

MODELING AND SIMULATION WITH EXCEL
23PMAE14 - EVEN Semester

Introduction to Monte Carlo Simulation in Excel

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Monte Carlo Simulation

A Monte Carlo Simulation is a method for modelling probabilities by using random numbers to approximate and simulate possible outcomes.

Nowadays, it is widely used as an analysis tool

A Monte Carlo Simulation can be developed using Microsoft Excel and a game of dice.

Monte Carlo simulations use a series of random numbers to model complex problems.

The process involves:

Generating random numbers

Based on chosen distributions

Executing Calculations

Multiple times

Summarizing results:

Using average, variance, and confidence intervals.

Monte Carlo simulation is a mathematical technique that uses computer programs to predict the possible outcomes of uncertain events.

Uses

Estimate Sales

   a Monte Carlo simulation program can estimate a new product's first month's sales by using historical sales data, product price, advertising budget, and other Factors.

Assess investment risk

A Monte Carlo simulation can help estimate the risk factor of an investment portfolio.

Optimize detector design

In nuclear medicine imaging, Monte Carlo simulations can help optimize detector design and acquisition and processing protocols.

Plan for retirement

A Monte Carlo simulation can help determine the probability that a client will run out of funds

Calculating net profit

A Monte Carlo simulation can be used to calculate net profit,

Which is a function of sales volume, selling price, unit cost and fixed costs. Each of these factors has some uncertainty, so a Monte Carlo simulation can help account for that.

<u>Predicting the outcome of a decision</u>

A Monte Carlo simulation can be Used to predict the outcome of a decision,

Such as trying out a new restaurant. There are multiple possible outcomes, and each outcome has a likelihood or probability.

Calculating the probability of rolling dice

A Monte Carlo simulation can be used to calculate the probability of specific number on dice.

THANK YOU

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