# GOVT SUS COLLEGE, SUNAM

## TOPIC – SIMULATION

## SUBJECT- OPERRATION RESEARCH

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# INTRODUCTION ABOUT OPERATION RESEARCH

Operational research (OR) encompasses the development and the use of a wide range of problem-solving techniques and methods applied in the pursuit of improved decision-making and efficiency, such as simulation, mathematical optimization, queueing theory and other stochastic-process models, Markov decision processes, ...

# *SIMULATION*

- Simulation is a method of solving decision making problem by designing ,constructing and manipulating a model of the real system. It is a useful technique for solving a business problem where many values of the variables are not known or partly known in advance and there is no easy way to find these values.

# PROCESS OF SIMULATION

- Define the problem or system you intended to simulate.

- Formulate the model you intend to use.

- Test the model; compare its behaviour with the behaviour of the actual problem.

- Identify and collect the data needed to test the model.

# PROCESS OF SIMULATION

- Run the simulation

- Analyze the results of the simulation and, if desired, change the solution you are evaluating.

- Rerun the simulation to test the new solution.

- Validate the simulation; this involves increasing the chances of the inferences you may draw about the real situation.

# ADVANTAGES OF SIMULATION

- Simulation allows you to explore 'what if' questions and scenarios without having to experiment on the system itself.

- It helps you to identify bottlenecks in material, information and product flows.

- It helps you to gain insight into which variables are most important to system performance.

- Authentic. ..

- Repetitive. ...

- Personalized & Diverse. ...

- Technologica

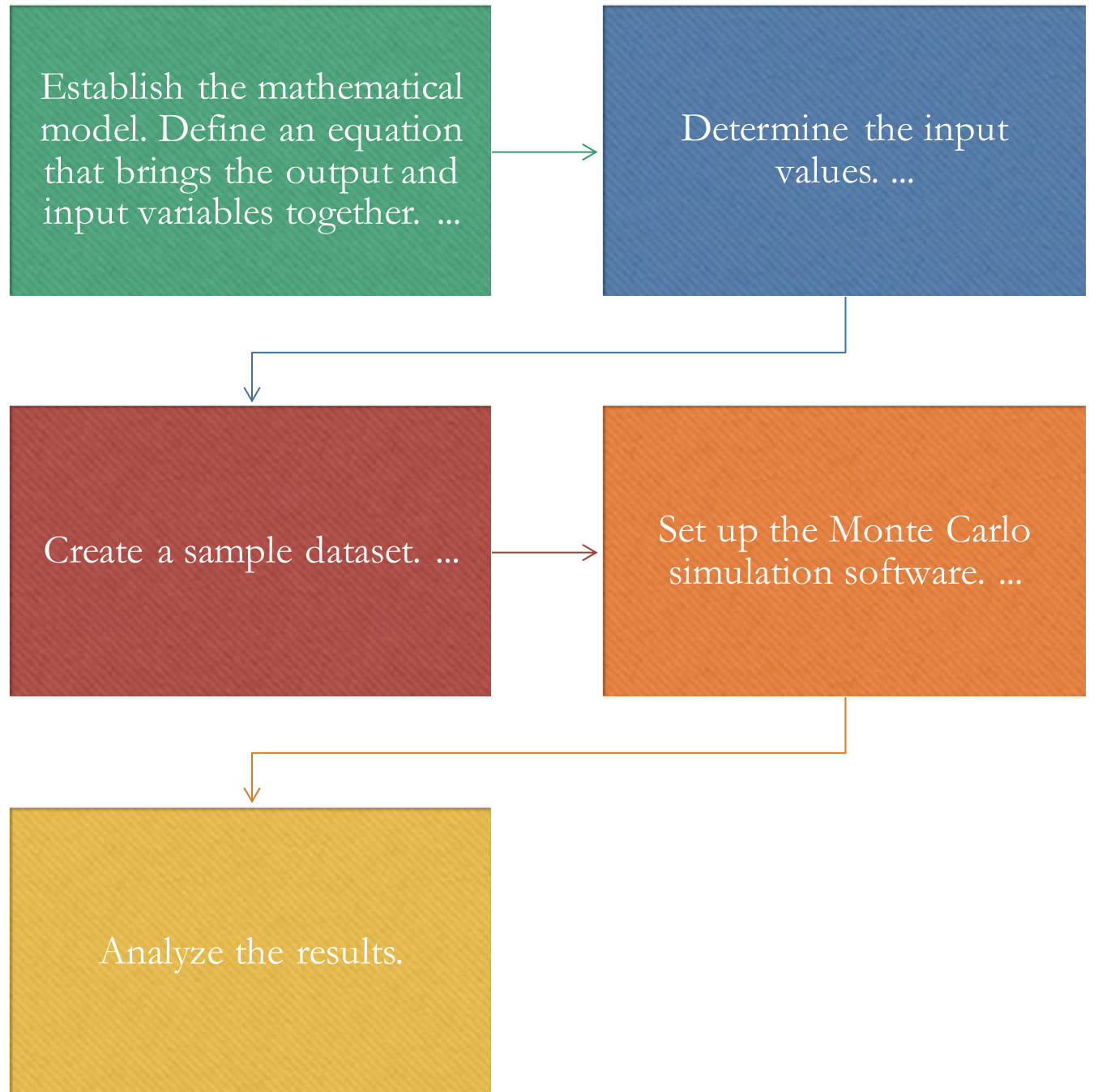## DISADVANTAGES OF SIMULATION

- Mistakes may be made in the **programming** or rules of the simulation or model.

- The cost of a simulation model can be high.

- The cost of running several different simulations may be high.

- Time may be needed to make sense of the results.

- People's reactions to the model or simulation might not be realistic or reliable.

# MONTE CARLO METHOD

Monte Carlo methods may be thought of as a collection of computational techniques for the (usually approximate) solution of mathematical problems, which make fundamental use of random samples. Two classes of statistical problems are most commonly addressed within this framework: integration and optimization.

# STEPS OF MONTE CARLO METHOD

Establish the mathematical model. Define an equation that brings the output and input variables together. ...

Determine the input values. ...

Create a sample dataset. ...

Set up the Monte Carlo simulation software. ...

Analyze the results.

# CONCLUSION

Simulated teaching is an innovative approach because students engage in genuine communication in playing their roles. Active involvement stems from participation in worthwhile, absorbing interaction which tends to make students forget they are learning a new skill.