GPSSS

MODELLING AND SIMULATION

→ subset of operation and research
→ MODEL → any formula can be model
→ SIMULATION → set of models required to solve problem in given constraints

* Model & Simulation
* Simulation uses a physical thing. Model is restricted to copy

→ TYPES OF SYSTEM
(i) Static: provides one service at one instance of time
(ii) Dynamic: multiple services at multiple instances

eg. of Simulation:
In budget calc, we compare current budget with aggregate of previous years. This ~~is~~ requires simulation.

* DISADVANTAGES OF SIMULATION
(i) Expensive, so can be used by big ventures and not small ventures.
(ii) Single input. so output may have error.

* ADVANTAGES OF SIMULATION
(i) Human Resource mgmt

TYPES OF SIMULATION:
(i) Discrete → open an account in a bank
(ii) Continuous → open account then open FD, then deposit money etc.

* STEPS UNDER SIMULATION
(i) Entity
(ii) Business demand
(iii) Business variables
(iv) External Factor / Internal Factor

→ QUEUEING MODEL :

Δ → time after which a person moves ahead in queue / service time

λ → time b/w start and end of queue

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→ COMPONENTS OF A SYSTEM

(i) ENTITY: An object of interest in the system.
(ii) ATTRIBUTE: A property of an entity.
(iii) ACTIVITY: A time of specified length
(iv) STATE: The collection of variable necessary to describe the system at any time, relating to the object of the study.
(v) EVENT: An instantaneous occurrence that may change the state of system
(vi) ENDOGENOUS: To describe activities and events occuring with in the system
(vii) EXOGENOUS: To describe activities and event in an environment that affect the system

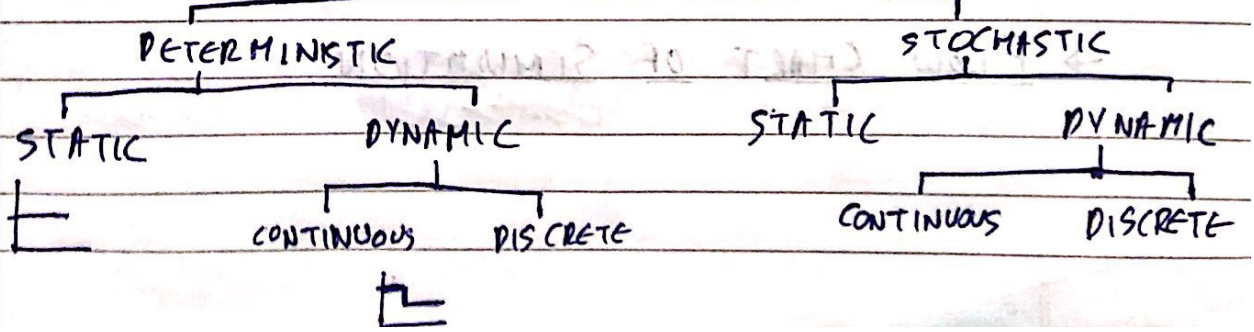
∴ Collectively, they become model

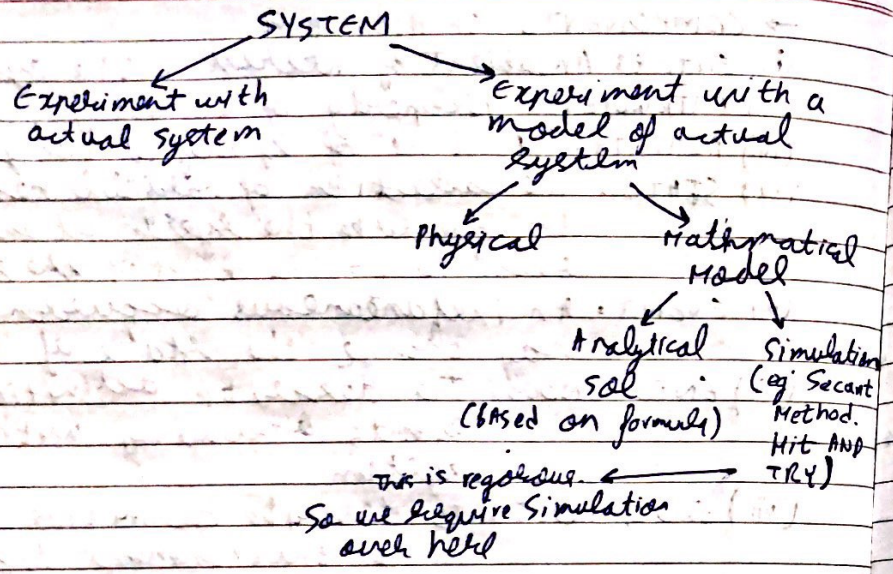
eg→

SYSTEM	Attribute	Activities	State variable
(i) Bank	checking	Arrival	Number of busy tellers
	deposit	Departure	Number of customer waiting
↓ ENTITY	↓ MAJOR AIM OF QUESTION/ SYSTEM	↓ SUB-TASKS REQUIRED TO ACHIEVE THEM	↓ DATA MAINTAINED

EVENT: eg: If bank manager says account doesnot have money, so this changes state of system.

→ SYSTEM MODEL

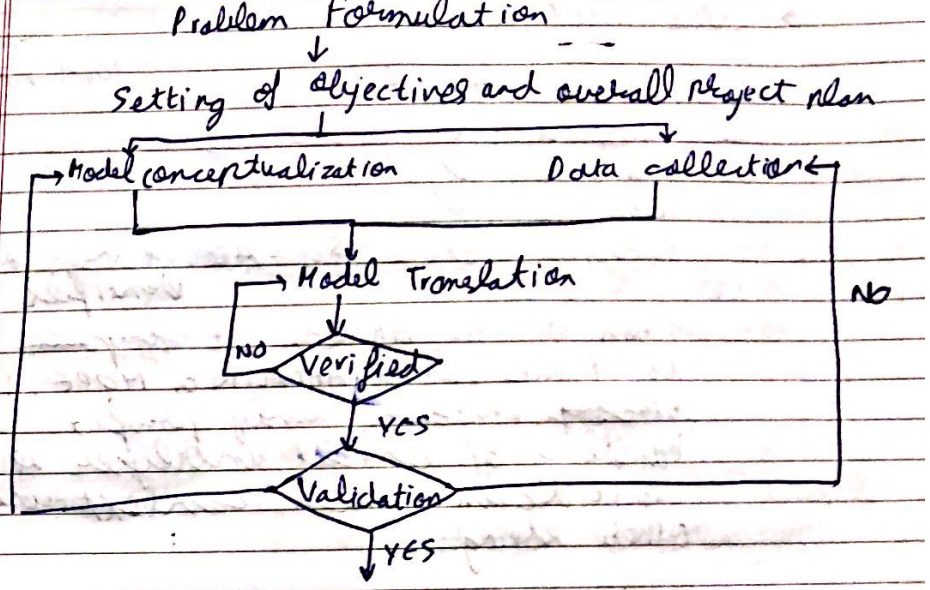




→ HOW TO DEVELOP A MODEL:
(i) Build a conceptual model
(ii) Convert it into specification model i.e close to our desired target specifically or not
(iii) Convert into computational model i.e simulation
(iv) Verify
(v) Validate

→ 3- MODEL LEVEL:
(i) Conceptual: State variables
(ii) Specification: Pseudo code:
(iii) Computational: Final code.

→ FLOW CHART OF SIMULATION:



LEXICAL ANALYZER

fi (a = 6)
- fi → identifier
- (→ bracket open
- a → identifier
- = → end operator
- 6 → identifier
-) → bracket close