Class-2

Only Introduction | Class 1 Not attended.

Book - Low Kelton.
2nd Edition (Pdf available)
= 3rd Edition (Book)

Features of R.

→ R is a well developed, simple, & effective programming language which includes conditional loops, user defined recursive functions & input/output functions.

→ It has an effective data handling and storage facility.

→ It provides a suit of operators for calculations on arrays, lists, vectors and matrices.

MATLAB

learning rules.

function → O/P.

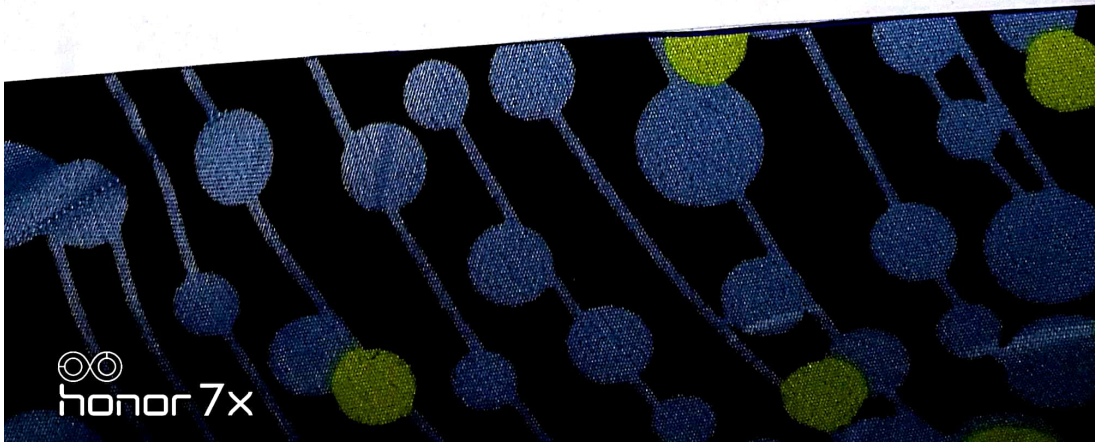
I/P [ ][ ]

→ It provides a large, coherent and integrated collection of tools for data analysis.

→ It provides graphical facilities for data analytics and display either directly at the computer and printing on paper.

R - object

Vectors, array,
Matrices, factors
lists, data frames,



Simplest object - vector

```
model ← c("Red", "Green")
print(model)
print(class(model))
```

O/P

"Red" "Green"

character

Q→ What is R-script?

Q→ What does the 6 class of vector mean?

Class-3.

Object Modelling

↳ UML : OOP concept

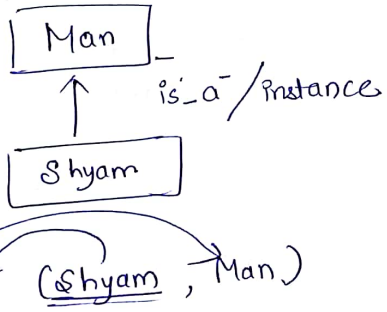
↙ Uniformed Machine Learning (Acc^n to Maa'm) ☺

Instance
- Is_A
- HAS_A

→ Shyam is a man

In predicate logic representation

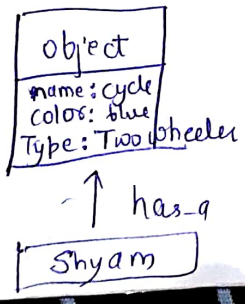
MAN (shyam)



→ Shyam has_a cycle

Represent it through predicate logic.

Has_a (shyam, cycle)

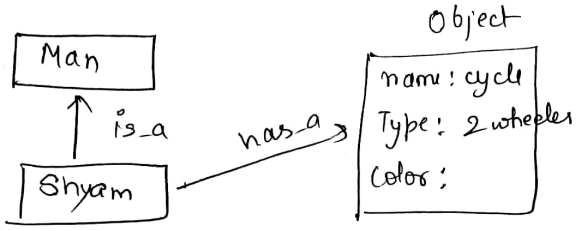


Next week

↳ Test

→ How can we link two sentences?

Shyam is_a man who has_a cycle.



→ A man has 2 eyes.

This is a part of aggregation.

class-4
8/4/81

Simulation

Simulation refers to a broad collection of methods and applications to mimick the behaviour of real system usually on a computer with appropriate software.

Computer Simulation

It refers to the methods for studying a wide varieties of model of real world systems by numerical evaluation using software design to initiate the system operation or characteristic over time. Practically simulation is the process of designing & creating a computerized model of a real or proposed system for the purpose of conducting numerical experiment to give us a better understanding of the behaviour of that system for a given set of conditions.

Diff. types of Simulation

(1) Static V/S Dynamic Simulation

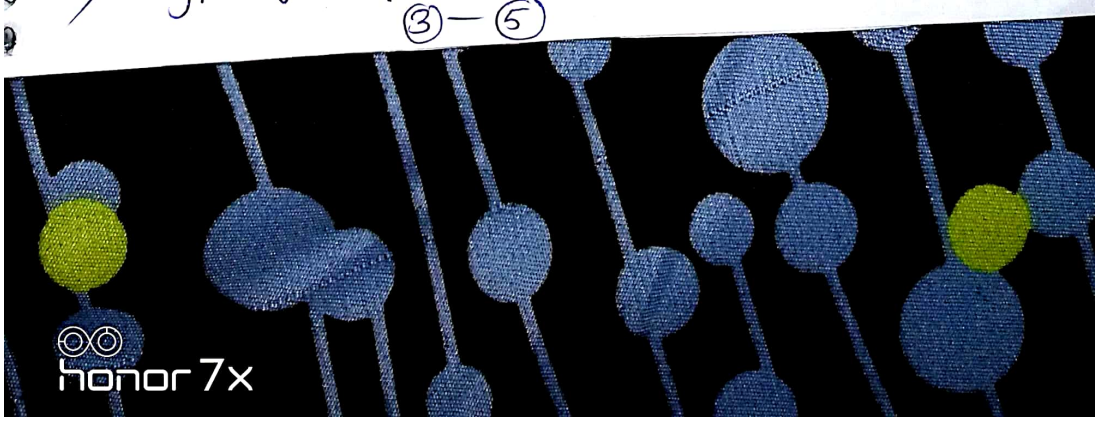
Static	Dynamic
↓	↓
No imp role of time	time is important

Static – The time doesn't play an important role

Dynamic → time plays an important role.

Q// What is computer simulation? What are the different types of it? (2 or max 5 marks)

③ – ⑤



(2) Continuous V/S Discrete

In a Continuous model, the state of the system can be change continuously over time but in discrete model change can occur only at seperated points in time.

→ If a model shows both continuous and discrete change in the same model, it is called as mixed continuous discrete model.

(3) Deterministic V/S ~~or~~ stochastic

System Models with no random input, are deterministic.

→ Stochastic models operate with atleast some inputs being random.

Arena easily handles deterministic and stochastic models and provides many probability distribution and processes that can be used to represent inputs.

Probability Theorem
- Bayes
- Poisson's
- Binomial

Probability

27/8/2018
Class-5

Binomial Random Variable

S_n → ① counts the no. of successes in a sequence of n-trials of an experiment.

② It takes only integer values between 0 and n and

$$P\left|S_n = k\right| = \binom{n}{k} p^k (1-p)^{n-k}$$

for $k = 0, 1, 2 \ldots n$.

③ The expectation of a random variable with n trials and probability of success p on each trial is

$$E\left|S_n\right| = np.$$

④ The variance of a binomial random variable with n trials and probability of success p on each trial is

$$var\left|S_n\right| = npq = np(1-p)$$

A Sample Space is denoted by Ω_n is the set of all possible sequences of n 0's & 1's representing all possible outcomes of the composite experiment

↓

It consists of repeating an elementary experiment n-times.

Elementary Experiment → It is a physical experiment

with two outcomes. An elementary experiment is also called as Bernaulli's trials.

Q.) A coin is flipped two times. Find the probability of getting a success when,

(i) Both heads ⟶ $\frac{1}{4}$

(ii) One Head & One Tail, ⟶ $\frac{1}{2}$.

Q.) 2) A coin is flipped 4 times,

(i) Two heads atleast

(ii) ~~One head~~ (One tail. Atmost)

(i) $P(0H) = \frac{1}{16}$

$P(1H) = \frac{4}{16}$

$1 - \left(\frac{1}{16} + \frac{4}{16}\right) = 1 - \frac{5}{16} = \frac{11}{16}$.

(ii)

$P(1T) = \frac{4}{16}$

$P(0T) = \frac{1}{16}$

$P = \frac{5}{16}$

Q.) Design a problem of getting a success with 9 heads

{ } ( )

Q. Write a simulation to experimentally simulate the coin flipping game of the example & of (experimentally determine the probability of a winning in

Syllabus

Ch-1

Ch-3

Ch-4

Ch-8

8.2, 8.4,

Kelton Ch-1, 2.

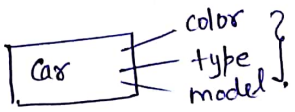
end Sem

28/8/2018

Objects of Simulation Model

Entities.

Attributes



Global variables

Local variables

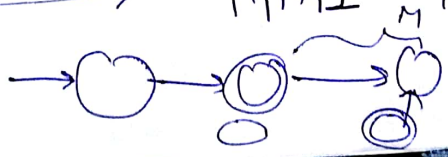
Resources. (OS part)

Fuel is a resource for a car.

→ What are the different pieces of simulation model?

→ Queues

M/M/1 queing model.



Simulation Clock

Discrete — 0, 1 

Continuous 

Starting & Stopping state.

System.