Structural Reliability
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Lecture –78
Monte Carlo Simulations (Part - 10)

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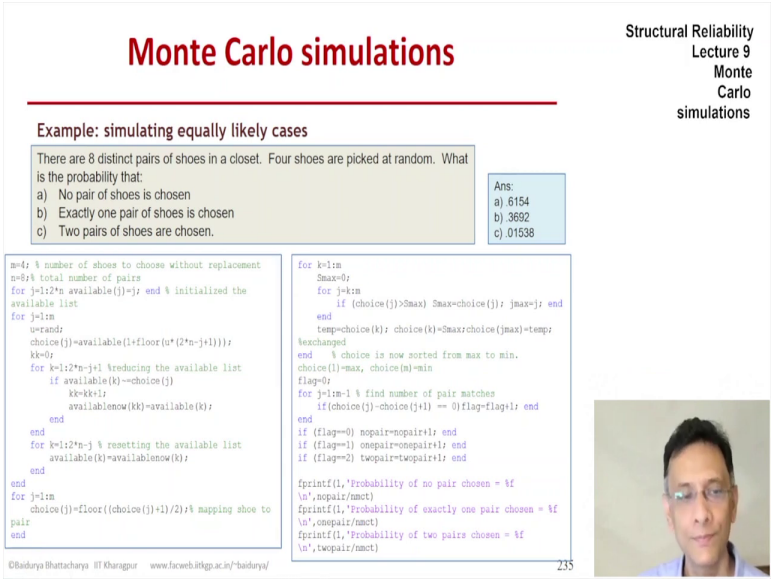

As an example of using discrete random variables to solve problems with Monte Carlo simulation let us go back to a homework problem this is a very classical problem involving the classical probability definition. So, we have eight pairs of shoes in a closet eight distinct pairs and four shoes are blindly drawn what is the probability that no pair is chosen or one pair exactly one pair is chosen or two pairs are chosen.

So, the key here is basically to be able to choose a shoe randomly repeatedly four times from the available ones and then see if there is any pair wise match or not. So, I have produced part of the code that I have written to solve this and this sort of approach can be very useful because problems in combinatorics and problems involving the classical definition of probability can be very challenging.

So, sometimes it may be useful to write a small simulation program to verify your answers. So,

here the key is to be able to choose the four shoes randomly from the available ones uh. So, there you see in the in the first for loop j going from 1 to m uh. So, we we just generate one random number uniform random number by the rand command and then choose from the available shoes.

And then once we keep choosing just making sure that it is taken out of the outer circulation and once that is done. We just map the chosen shoes to the pairs they came from and then make a simple comparison as to if there is any pair match if there is one or two or none. So, then if we do it enough number of times then we can get a good enough approximation to the classical probability provided we have coded the logic correctly.

Now if you want the answer to these three questions here they are if you add these three numbers they should add up to one.