AI1103-Assignment 1

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Download all python codes from

https://github.com/asishcs2011010/demo/blob/main/assignment−1/assignment−1.py

and latex-tikz codes from

https://github.com/asishcs2011010/demo/blob/main/assignment−1/assignment.tex

Question

A box of oranges is inspected by examining three randomly selected oranges drawn without replacement. if all the three oranges are good,the box is approved for sale, otherwise, it is rejected. find the probability that a box containing 15 oranges out of which 12 are good and 3 are bad ones will be approved for sale

Solution

Given, there are 15 orange out of which 12 are good one sand 3 are bad

let $X \in \{0, 1\}$ be the random variable which denotes
whether the picked up orange is good or bad.
1 represents picking up of good orange
0 represent picking up of bad orange

1) For the first draw of the inspection

X	$X = 0$	$X = 1$
Pr	3/15	12/15

(0.0.1)

the probability of getting good orange in first draw is $Pr(X = 1)$ is 12/15 = 0.8

2) For the second draw of the inspection

X	$X = 0$	$X = 1$
Pr	3/14	11/14

(0.0.2)

the probability of getting good orange in second draw is $Pr(X = 1)$ is 11/14 = 0.786

3) For the third draw of the inspection

X	$X = 0$	$X = 1$
Pr	3/13	10/13

(0.0.3)

the probability of getting good orange in third draw is $Pr(X = 1)$ is 10/13 = 0.769

For approval to sale, we need 3 oranges to be good
As they are independent events, the probability of selecting 3 good oranges is $=(0.8) * (0.786) * (0.769) = 0.483$
The probability that a box containing 15 oranges out of which 12 are good and 3 are bad ones will be approved for sale is = 0.483