Assignment 1

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Download all python codes from

https://github.com/Yagna20/AI1103/blob/main/Assignment1/Assignment%201.py

and latex-tikz codes from

https://github.com/Yagna20/AI1103/blob/main/Assignment1/Assignment1.tex

1 Problem 2.5

'A couple has two children, (i) Find the probability that both children are males, if it is known that at least one of the children is male. (ii) Find the probability that both children are females, if it i

2 Solution

Let $X\epsilon\{0,1,2,3\}$ represent a random variable where

- $0 \rightarrow$ both males.
- $1 \rightarrow$ elder male and younger female.
- $2 \rightarrow$ elder female and younger male.
- $3 \rightarrow$ both females.

(i)From the given information

$$\Pr(X=3) = 0 \tag{2.0.1}$$

$$\Pr(X=0) = \frac{1}{3} \tag{2.0.2}$$

$$\Pr(X=1) = \frac{1}{3} \tag{2.0.3}$$

$$\Pr(X=2) = \frac{1}{3} \tag{2.0.4}$$

$$\tag{2.0.5}$$

So the probability that both the children are male is $\frac{1}{3}$. (ii) From the given information

$$\Pr(x=0) = \Pr(x=1) \qquad = 0 \tag{2.0.6}$$

$$\Pr(x=2) = \frac{1}{2} \tag{2.0.7}$$

$$\Pr(x=3) = \frac{1}{2} \tag{2.0.8}$$

$$\tag{2.0.9}$$

So the probability that both the children are female is $\frac{1}{2}$.