Assignment 1

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Download all python codes from

https://github.com/CS20BTECH11054/AI1103/blob/main/codes/Assignment_1.py

and latex-tikz codes from

https://github.com/CS20BTECH11054/AI1103/blob/main/Assignment_1.tex

1 Problem

(Prob, 5.1) It is given that in a group of three students, the probability of 2 students not having the same birthday is 0.992.What is the probability that the two students has the same birthday?

2 Solution

We know that two students either have birthday on same date or they don't have same birthday. No other cases are possible.
Therefore, we can consider this as a bernoulli distribution, by defining a random variable X such that,if $X = 0$, then they don't have same birthday, if $X = 1$, then they have same birthday. Therefore,

$$Pr(X = 0) + Pr(X = 1) = 1 \tag{2.0.1}$$
$$Pr(X = 0) = 0.992 \tag{2.0.2}$$
$$Pr(X = 1) = 1 - Pr(X = 0) \tag{2.0.3}$$
$$Pr(X = 0) = 1 - 0.992 \tag{2.0.4}$$
$$Pr(X = 0) = 0.008 \tag{2.0.5}$$

Therefore, the probability of two people not having same birthday is 0.008.