Assignment2

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***Abstract*— This document explains the concept of independent events and also test whether given 2 events are independent or not.**

Download all python codes from
https://github.com/cs19resch11004/5600/hari
Download all Latex-tikz codes from
https://github.com/cs19resch11004/5600/hari

I. Problem

A die is thrown. If E is the event the number appearing is a multiple of 3 and F be the event the number appearing is even then find whether E and F are independent ?

II. Explanation

Two events E and F are said to be independent iff $Pr(A \cap B) = Pr(A)Pr(B)$

III. Solution

Let S be a sample space, for the random experiment, rolling a die.

$$S = \{1, 2, 3, 4, 5, 6\} \tag{1}$$
$$n(S) = 6 \tag{2}$$
$$E = \{3, 6\} \tag{3}$$
$$n(E) = 2 \tag{4}$$
$$F = \{2, 4, 6\} \tag{5}$$
$$n(F) = 3 \tag{6}$$

We need to check whether the following equation is true or false, $Pr(E \cap F) = Pr(E)Pr(F)$

$$Pr(E \cap F) = \frac{1}{6} \tag{7}$$
$$Pr(E)Pr(F) = (\frac{2}{6})(\frac{3}{6}) = \frac{1}{6} \tag{8}$$

IV. Conclusion

Above two values are equal, so given two events E and F are independent.