Assignment 3

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Download all python codes from

https://github.com/sachinkarumanchi/probability_and_random_variables/blob/Assignment3/assignment3.py

and latex-tikz codes from

https://github.com/sachinkarumanchi/probability_and_random_variables/blob/Assignment3/Assignment3.tex

1 Problem

The probability that a number selected at random between 100 and 999 (both inclusive) will not contain digit 7 is.

2 Solution

Let's assume a random 3-digit number be xyz. Where x, y, z are 3 random single-digit integers such that

$$x \in \{1,2,3,4,5,6,7,8,9\} \tag{2.0.1}$$

$$y \in \{0,1,2,3,4,5,6,7,8,9\} \tag{2.0.2}$$

$$z \in \{0,1,2,3,4,5,6,7,8,9\} \tag{2.0.3}$$

1) Probability of selecting x without including 7

$$\Pr(x \neq 7) = \frac{8}{9} \tag{2.0.4}$$

2) Probability of selecting y without including 7

$$\Pr(y \neq 7) = \frac{9}{10} \tag{2.0.5}$$

3) Probability of selecting z without including 7

$$\Pr(z \neq 7) = \frac{9}{10} \tag{2.0.6}$$

So,the total probability of a random 3-digit number xyz will not contain 7

$$= \Pr(x \neq 7) \times \Pr(y \neq 7) \times \Pr(z \neq 7) \tag{2.0.7}$$

$$= \frac{8}{9} \times \frac{9}{10} \times \frac{9}{10} \tag{2.0.8}$$

$$= \frac{18}{25} \tag{2.0.9}$$

The probability of a number selected at random between 100 and 999 (both inclusive) will not contain digit 7 is $\frac{18}{25}$