Assignment 7
Probability and Random Variables

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I. Problem

The probability that k-digit number does not contain 0,5 or 9 is?

II. Solution

Total possibilities $=10^k$, because every digit has 10 options from 0 to 9.
Possibility of not containing any digit 0,5,9$=7^k$, now every digit has 7 options. Required probability $=\frac{7^k}{10^k} = 0.7^k$
Answer : (C)

Let P(X) denote the probability of that k-digit number does not contain 0, 5 or 9. The probabilities were simulated for k varying from 1 to 10 digit using the python code. The theoretical and simulated probabilities were plotted and found to be almost same.

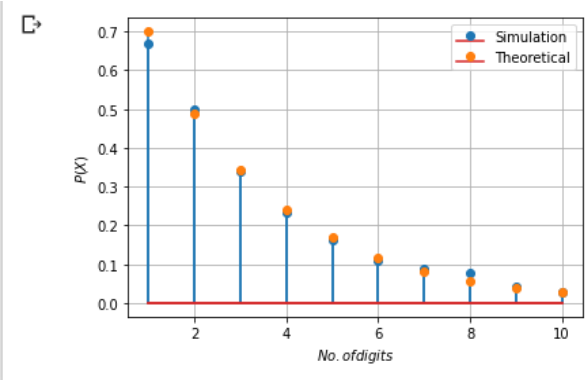

Figure 1: Simulation for tossing a fair coin

Download python code from here

https://github.com/Swati-Mohanty/AI5002/blob/main/Assignment_7/codes/sim.py

Download latex code from here-

https://github.com/Swati-Mohanty/AI5002/blob/main/Assignment_7/codes/assignment7.tex