

# Assignment 2

## Probability

Swati Mohanty (EE20RESCH11007)

### I. PROBLEM

A die is thrown three times. Events A and B are defined as below:

A : 4 on the third throw.

B : 6 on the first and 5 on the second throw.

Find the probability of A given that B has already occurred?

### II. SOLUTION

Total sample space = 216

Sample space of A (4 on the third throw) = 36

Sample space of B (6 on the first and 5 on second throw) = 6

$$P(A) = \frac{36}{216} \quad (1)$$

$$P(B) = \frac{6}{216} \quad (2)$$

$$P(A \cap B) = P(A) \times P(B) \quad (3)$$

$$= \frac{36}{216} \times \frac{6}{216} = \frac{1}{216} \quad (4)$$

$$P(A|B) = \frac{P(A \cap B)}{P(B)} \quad (5)$$

$$= \frac{\frac{1}{216}}{\frac{6}{216}} = \frac{1}{6} = 0.167 \quad (6)$$

### III. SIMULATION RESULT

Theoretical probability = 0.167

Simulated probability = 0.162

Percentage of error obtained = 3.02

```

39
40 line_bis.p
41 pip-selfc
42 probabili
43 quad_are
44 sheru.py
45
46 External Libraries
47 < Python 2.7
48 Extended
49 DLLs libr
50 Lib libr
51 lib-tk
52 Binary Sk
53 venv libr
54
55 Run: probability x
56
57 [[2, 5, 4]]
58 [[3, 5, 4]]
59 0.162037037037
60 0.0231481481481
61 0.162037037037
62 ('Simulation probability = ', 0.16203703703703703)
63 ('Theoretical probability = ', 0.167)
64 ('Simulation error %:', 3.0628571428571503)
65
66 Process finished with exit code 0
67
68 4: Run 6: TODO Terminal Python Console

```

Python project link

<https://github.com/Swati-Mohanty/EE5600/tr>