

Math Document Template

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Download all python codes from

svn co <https://github.com/SiddharthPh/Summer2020/trunk/geometry/Probststat/codes>

1 PROBABILITY EXERCISES

1.1 Exercise 1

1.1.1 Problem: Suppose you drop a die at random on the rectangular region shown in Fig.15.6. What is the probability that it will land inside the circle with diameter 1m?

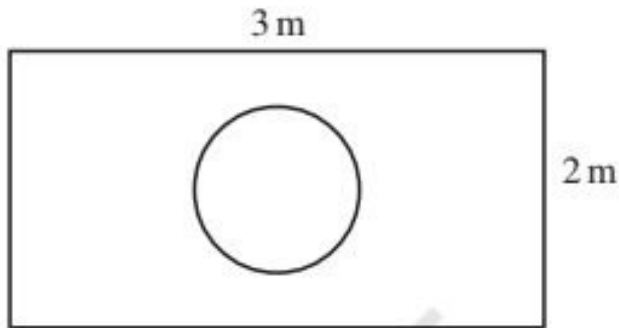


Fig. 15.6

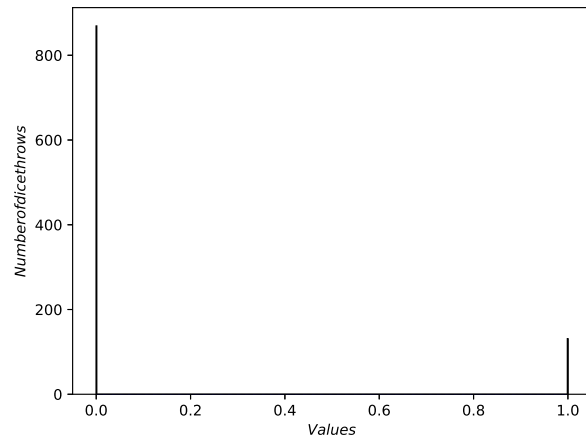


Fig. 1.1.2.1: Histogram

The Value 0 in the figure 1.1.2.1 shows that out of 1000 throws 869 times, it doesn't fall in the circle, for the rest of 131 throws the dice is in the circle.

1.1.2 Solution:

1. In the given question,

The sample size = Total Area of the rectangle =

$$3 \times 2 = 6m^2 \quad (1.1.2.1.1)$$

Favourable outcome = Area of Circle =

$$\pi \left(\frac{1}{2} \right)^2 = \frac{\pi}{4} m^2 \quad (1.1.2.1.2)$$

Probability(P) of the dice landing in the circle = $\frac{\pi}{24}$

$$\therefore P = 0.1308$$

The python code for the figure 1.1.2.1

prob/codes/prob1.py

shows the histogram plot data in 1000 dice throws.