Selected Problems Chapter 2
Probability Theory, Grinstead/Snell, Second Edition

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May 28, 2020

Problem 4 Statement. Describe in words the events specified by the following subsets of

$$\Omega = \{HHH, HHT, HTH, HTT, THH, THT, TTH, TTT\}$$

(a) E = {HHH, HHT, HTH ,HTT}
(b) E = {HHH, TTT}
(c) E = {HHT, HTH, THH}
(d) E = {HHT, HTH ,HTT, THH ,THT ,TTH, TTT}

Problem 4 .

(a) The first flip is H.
(b) All flips are of the same type.
(c) Exactly 2 Heads.
(d) At least 1 T.

Problem 5 Statement. What are the probabilities of the events described in Exercise 4?

Problem 5 .

(a) 1/2
(b) 1/4
(c) 3/8
(d) 7/8

Problem 6 Statement. A die is loaded in such a way that the probability of each face turning up is proportional to the number of dots on the face. (For example, a six is three times as probable as a two.) What is the probability of getting an even number in one throw?

Problem 6 . Let $s = P(6)$. Since the probabilities are proportional to the number of dots on the face, we have :

$$P(\Omega) = 1 = s + \frac{5}{6}s + \frac{4}{6}s + \frac{3}{6}s + \frac{2}{6}s + \frac{1}{6}s,$$

thus, $s = \frac{2}{7}$, and

$$\begin{aligned} P(6) &= \frac{2}{7} \\ P(5) &= \frac{10}{42} \\ P(4) &= \frac{8}{42} \\ P(3) &= \frac{6}{42} \\ P(2) &= \frac{4}{42} \\ P(1) &= \frac{2}{42} \end{aligned}$$

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