

CSCE 317 Spring 2016

QUIZ 3

Assigned Tuesday, 16-02-02

1. In the following quote from Phil Dawid's "On Individual Risk," <http://arxiv.org/abs/1406.5540>, June 24, 2014, the author describes one of the three major interpretations of probability (classical, limiting frequency, and subjectivistic). Which one?

The underlying conception is that we have a number of elementary outcomes of an experiment, exactly one of which will actually be realised when the experiment is performed. For example, there are $N = 53,644,737,765,488,792,839,237,440,000$ ways in which the cards at Bridge can be distributed among 4 players, and just one of these ways will materialise when the cards are dealt. Any event of interest, for example "North holds 3 aces," can be represented by the set of all the elementary outcomes for which it is the case; and the number n of these, divided by the total number N of all elementary outcomes, is taken as the measure of the probability of the event in question. The mathematics of ... Probability is thus really a branch of Combinatorial Analysis, the far from trivial mathematical theory of counting.

Answer: Classical

2. Each of the three interpretations of probability mentioned in the first question is a model of a set of axioms, sometimes simply called "probability axioms," but usually named after a Russian mathematician who lived from 1903 to 1987. What is this mathematician's name?

Answer: (Andrey Nikolaevich) Kolmogorov

3. How many axioms does the set mentioned in the previous question have?

Answer: 4 or 3, depending on whether you take the definition of conditional probability as an axiom, as done by Neapolitan and De Finetti, or as a definition, as Kolmogorov apparently did. Also, even if one takes the definition of conditional probability to be an axiom, it may be argued that it should not be called one of the axioms of Kolmogorov.