COMP9020 18s1

Week 12 Problem Set
Random Variables and Expectation

Foundations of Computer Science

[Show with no answers] [Show with all answers]

Congratulations on reaching the end of this course!

Just one exercise for the last lecture. A sample solution will be posted on Friday (week 13).

1. (Expectation, variance)

   You randomly draw one card at a time from a deck of 52 Poker cards: {*2, 3, …, 10, J, Q, K, A*} × {♠, ♣, ♥, ♦}.

   a. Assume that the cards are not put back into the deck after each drawing.

      i. Is the event of drawing a specific card independent of the previous draw?

      ii. Calculate the expected number of drawing attempts until a card other than an ace is drawn.

      iii. Calculate the expected number of drawing attempts until the sum of the cards drawn is ≥5. (2–10 are counted as their numeric value; *J, Q, K* are counted as 10; *A* is counted as 11).

      iv. Calculate the variances of the two random variables considered in questions (ii) and (iii).

   b. Answer questions (i)–(iii) for the case when the cards are put back after each drawing.

   [show answer]