

Module 12 self-assessment

Question 1

Suppose each of three persons flips a coin. If the outcome of one of the tosses differs from the others, the game ends, otherwise they flip their coins again. The process repeats until at least one of the coins lands on a different outcome compared to the other two. Assuming fair coins, what is the probability that the game will end after the first round of tosses? If all three coins are biased and have probability $1/4$ of landing H , what is the probability that the game will end at the first round?

Question 2

It is estimated that 50% of received emails are spam emails. A software has been installed by the IT department of the University to filter these spam emails before they reach our inboxes. The supplying software company claims that it can detect 99% of spam emails, and it is believed that the probability for a false positive (a non-spam email classified as spam) is only 5%. If an email is detected as spam, what is the probability that it is in fact a non-spam email? [Hint: Use Bayes' theorem.]