

Mathematics in Computing: 4COSC007C

Tutorial 5

1. Find the probabilities of the following questions.
 - i. A die is thrown and a coin is tossed. What is the probability of getting an even score on the die and a tail?
 - ii. Suppose you have two packs each of 52 playing cards. A card is drawn from the first and a card is drawn from the second. What is the probability that both cards are the Ace of Spades?
 - iii. A coin is tossed eight times. What is the probability of obtaining eight tails?
 - iv. A die is thrown four times. What is the probability of obtaining four '1's?
2. A fair die is rolled twice and we obtain two numbers $X1$ = result of the first roll, and $X2$ = result of the second roll. Let A and B be the events defined as follows: **A is $X1 < X2$; B is You observe a 6 at least once.**
 - i. Define the probability space, D, in set builder notation and its cardinality.
 - ii. Find the cardinality of event A represented as a subset of the probability space D. Find the probability of event A
 - iii. Find the cardinality of event B represented as a subset of the probability space D. Find the probability of event B
3. A fair die is rolled twice and we get two numbers X = **result of the first roll** and Y = **result of the second roll.**
 - i. What is the probability that $X = 4$?
 - ii. What is the probability that $Y = 4$?
 - iii. What is the probability that both $X = 4$ and $Y = 4$?
For the problems below let A be the event that $X = 4$ or $Y = 4$ and B be the event that $X + Y = 7$.
 - iv. What is $P(B)$?
 - v. What is $P(A \cap B)$?
 - vi. Given that we know B, what is the probability of A?

Home Work

1. A die is thrown. Find
 - i. the probability of obtaining a score less than 6
 - ii. the probability of obtaining a score more than 6
 - iii. the probability of obtaining an even score less than 5
 - iv. the probability of obtaining an even score less than 2
2. There are four Aces in a pack of 52 playing cards. What is the probability that a card selected at random is not an Ace?
3. A drawer contains six red socks, six black socks and eight blue socks. Find the probability that a sock selected at random from the drawer is
 - i. black
 - ii. red
 - iii. red or blue
4. Two dice are thrown together and their scores are added together. By considering all the possible outcomes, find the probability that the total score will be
 - i. 12
 - ii. 0
 - iii. 1
 - iv. 2
 - v. more than 5
5. basket contains 87 good apples and three bad ones. What is the probability that an apple chosen at random is bad?
6. box contains 16 red blocks, 20 blue blocks, 24 orange blocks and 10 black blocks. A block is picked at random. Calculate the probability that the block is
 - i. black
 - ii. orange
 - iii. blue
 - iv. red or blue
 - v. red or blue or orange
 - vi. not orange
7. Three coins are tossed. By considering all possible outcomes calculate the probability of obtaining
 - i. two heads and one tail
 - ii. at least two heads
 - iii. no heads