

MAT1830 - Discrete Mathematics for Computer Science
Assignment #7

To be handed in at the beginning of your support class in week 9 (1 – 5 May)

Fully explain your answers for all questions.

1. Find expressions for each of the following. (Leave your answer as a mathematical expression rather than a number.)
 - (a) The number of ternary strings (strings of 0s, 1s and 2s) of length 9.
 - (b) The number of strings of 6 lower case letters (a–z) that do not contain any letter twice or more.
 - (c) The number of binary strings of length 100 that contain at most two 1s.
 - (d) The number of ternary strings of length 10 (strings of 0s, 1s and 2s) containing exactly two 1s and exactly three 2s.

2. A small school with 14 students has a basketball team with 5 players, a chess team with 4 players, a netball team with 7 players, and a soccer team with 11 players.
 - Each student is on at least one of these teams and no student is on all four teams.
 - Only one student, Hawa, is on three of the teams: she plays chess, netball and soccer.
 - There is exactly 1 student who plays basketball and chess.
 - There is exactly 1 student who plays basketball and netball.
 - Hawa is the only student who plays chess and netball.
 - There are exactly 3 students (including Hawa) who play chess and soccer.
 - There are exactly 5 students (including Hawa) who play netball and soccer

How many students play basketball and soccer?

3. What is the coefficient of x^{10} in the expansion of $(5x^2 + 3)^{14}$? (Leave your answer as a mathematical expression rather than a number.)