

Kennesaw State University
College of Computing and Software Engineering
Department of Computer Science
Mathematical Structures for Computer Science
CS5070 Assignment 3

1. A group of 35 programmers are applying for a job. The number of applicants with competency in C++ is 25, the number with competency in Java is 28, and the number with competency in neither languages is 2. How many applicants have competency in both languages?
2. There 26 letters in English. Calculate the number of vehicle license plates that start with three letters followed by 4 digits, with no repetitions.
3. Calculate the number of ways that 4 cards can be drawn, with replacement, from a deck of 52 cards.
4. Calculate the number of ways that 4 cards can be drawn, without replacement, from a deck of 52 cards.
5. Calculate the number of different combinations that can be ordered from a restaurant that allow persons to order exactly two of eight main dishes as part of the dinner special.
6. Find the coefficient of a^5b^7 in the binomial expansion of $(a - 2b)^{12}$
7. Apply the binomial theorem to prove that

$$3^n = \sum_{k=0}^n 2^k C(n, k)$$