

Discussion 8  
Elementary Discrete Structures  
Spring 2023  
CSCI-H 241

February 24, 2023

1. The name of a variable in the C programming language is a string that can contain uppercase letters, lowercase letters, digits, or underscores. Further, the first character in the string must be a letter, either uppercase or lowercase, or an underscore. If the name of a variable is determined by its first eight characters, how many different variables can be named in C? (Note that the name of a variable may contain fewer than eight characters.)
2. A standard deck of 52 cards has 13 kinds of cards, with four cards of each of kind, one in each of the four suits, hearts, diamonds, spades, and clubs. How many cards must be selected from a standard deck of 52 cards to guarantee that at least three cards of the same suit are selected?
3. Thirteen people on a softball team show up for a game.
  - (a) How many ways are there to choose 10 players to take the field?
  - (b) How many ways are there to assign the 10 positions by selecting players from the 13 people who show up?
  - (c) Of the 13 people who show up, three are women. How many ways are there to choose 10 players to take the field if at least one of these players must be a woman?
4. Use the binomial theorem to expand  $(3x - y^2)^4$  into a sum of terms of the form  $cx^ay^b$ , where c is a real number and a and b are nonnegative integers.
5. How many ways are there to distribute 12 indistinguishable balls into six distinguishable bins?