

TUTORIAL 4

- (1) Suppose that everyone in Australia has a jar of 100 coins. These coins are either 5 cent, 10 cent, 20 cent, 50 cent, one dollar, or two dollar coins. Is it possible that no two people have the same number of coins of each type?
- (2) Give a combinatorial proof of the chairperson identity:

$$k \binom{n}{k} = n \binom{n-1}{k-1}$$

- (3) Count the number of five-card hands from a standard 52-card deck having
- (a) A flush
 - (b) A full house
 - (c) A straight flush

Just for fun.

- (1) Give a combinatorial proof of the following summation identities
- (a) $\sum_{i=1}^n (i-1) = \binom{n}{2}$
 - (b) $\sum_{i=1}^n (i-1)(n-i) = \binom{n}{3}$