

**problem #1**

A theater has 7 seats left ( $S_1, \dots, S_7$ ) (reserved seating). Some people show up, each wanting to buy one ticket. In how many ways can the tickets be sold if there are

- (a) 7 people  $P_1, \dots, P_7$
- (b) 9 people  $P_1, \dots, P_9$
- (c) 5 people  $P_1, \dots, P_5$

**solution**

(a) Match the people and the seats. (Or use the people as slots. Or use the seats as slots) Answer is  $7!$

(b) Use the seats as the slots.  $9 \cdot 8 \cdot 7 \cdot \dots \cdot 3$  ( $= 9!/2!$ )

(c) Use the people as the slots.  $7 \cdot 6 \cdot 5 \cdot 4 \cdot 3$  ( $= 7!/2!$ )