

L 20: Weds., March 8.

- Housekeeping:
- Homework due today
 - — " — Friday
 - No { discussion
summary } due Monday (spr. break)
 - Exam 2 will be pushed forward 1 week
 - Extra credit deadlines on Weds. during break

Last time: Finished with permutations, combinations, and counting
Questions?

This time: Review of Venn diagrams $\dot{=}$ how to use the
logical operators AND, OR, NOT

~~Using addition, subtraction rules for probability~~

Events, sets, Venn Diagrams.

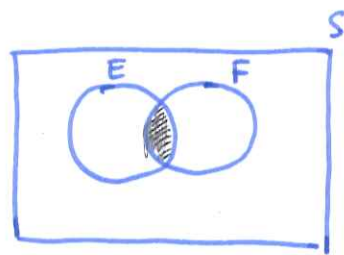
Suppose that E is the event that it snows 20 days or more in January, and F is the event that it snows between 18 and 24 days.

i.e., $E := \{20, 21, 22, \dots, 31\}$ and $F := \{18, 19, \dots, 24\}$.

$S = \{0, 1, \dots, 31\}$.

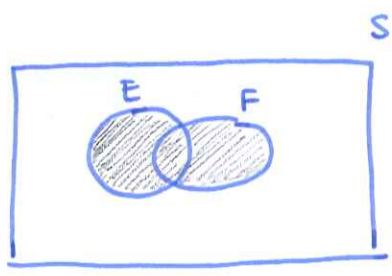
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(a) E and F
 $E \cap F$
"the intersection of E and F "



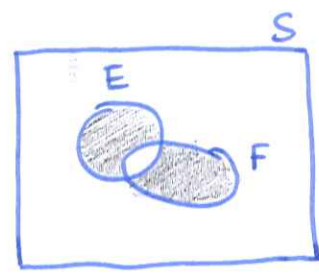
$$E \cap F = \{20, 21, \dots, 24\}$$

(b) E or F
 $E \cup F$
"the union of E and F "



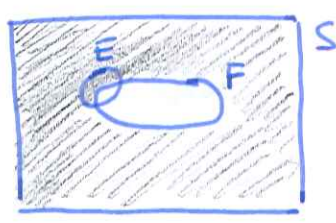
$$E \cup F = \{18, 19, \dots, 31\}$$

(c) E or F but not both
 $E \text{ xor } F$
 $(E \cup F) \setminus (E \cap F)$



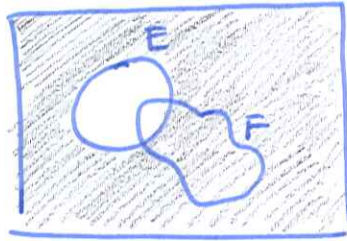
$$E \text{ xor } F = \{18, 19, 25, \dots, 31\}$$

(d) not F
 F^c
the complement of F
 $S \setminus F$



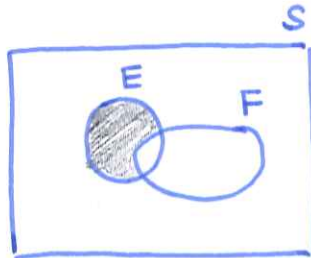
$$\text{not } F = \{0, \dots, 17, 25, \dots, 31\}$$

(e) not E
 E^c
 $S \setminus E$



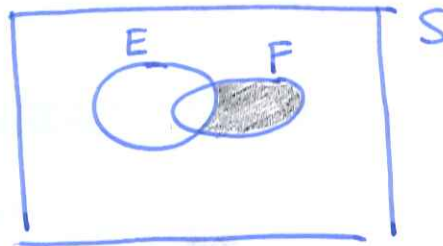
$\text{not } E = \{0, \dots, 19\}$

(f) E but not F
E and (not F)
 $E \setminus F$
 $E \cap F^c$



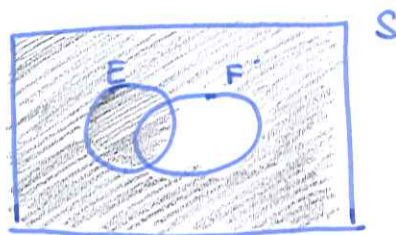
$E \text{ but not } F = \{25, 26, 27, \dots, 31\}$

(g) F but not E
F and (not E)
 $F \setminus E$
 $F \cap E^c$



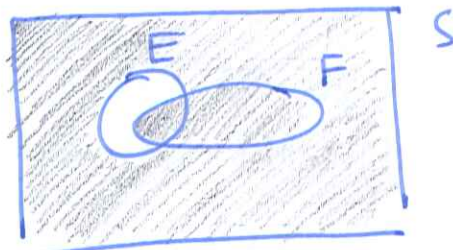
$F \text{ but not } E = \{18, 19\}$

(h) E or not F
E or F^c
 $E \cup F^c$



$E \text{ or not } F = \{0, \dots, 17, 20, \dots, 31\}$

(i) F or not E
F or E^c
 $F \cup E^c$



$F \text{ or not } E = \{0, \dots, 19, 20, \dots, 24\}$