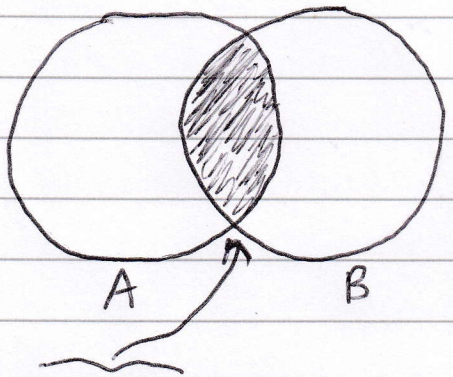
Intersection

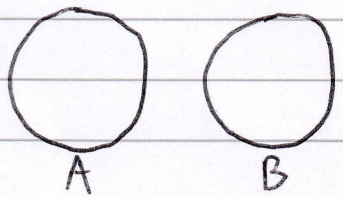


$A \cap B$ = "the intersection of A and B"
= the set of elements in A that are also in B

Symmetric: $A \cap B = B \cap A$

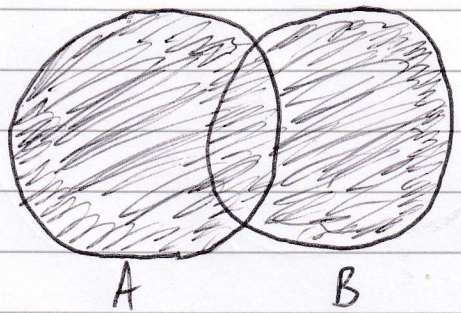
$|A \cap B| \leq |A| \qquad |A \cap B| \leq |B|$

If there is no overlap, the intersection is the empty set



$A \cap B = \{\}$
$|A \cap B| = 0$

Union



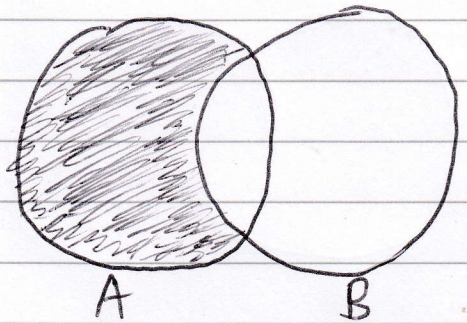
$A \cup B$ = "the union of A and B"
= the set of elements that are in A or in B (or in both)

Symmetric: $A \cup B = B \cup A$

$$|A \cup B| = |A| + |B| - |A \cap B|$$

avoids double-counting duplicates

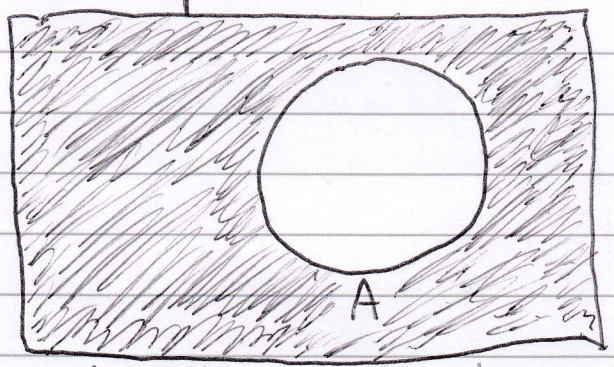
Difference



$A - B$ = "the difference of A and B"
= the set of elements that are in A but not in B

Not symmetric: $A - B \neq B - A$

Complement



U = "universal set"

A' = "the complement of A"
= the set of all elements in U that are not in A

Alternative notation: $\bar{A}$