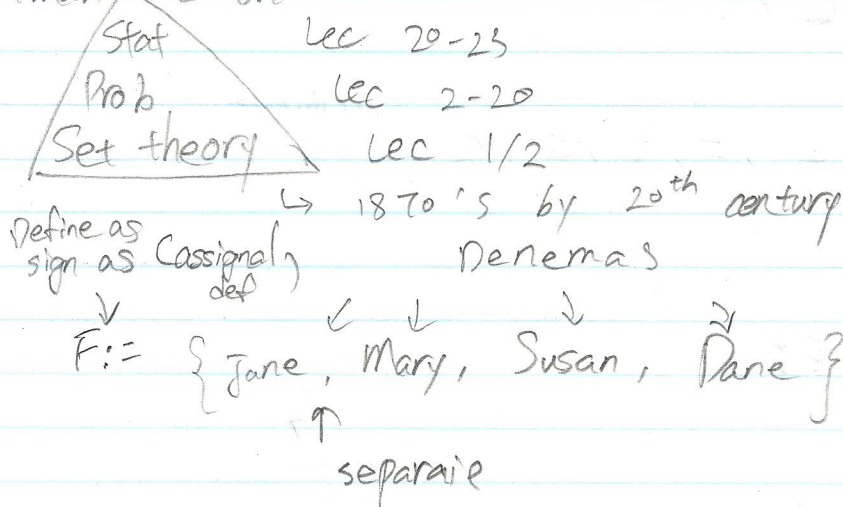


8/27 ★) H.W #0

All math based on it:



$M = \{ \text{Bob, Joe, Max, Darn} \}$

$N = \{ 1, 2, 3, \dots \}$ infinite number

integers

$\mathbb{Z} = \{ \dots, -1, 0, 1, \dots \}$

$\text{Jane} \in F$

\in = set inclusion
"element of"

$\text{Jane} \notin M$

\notin = not

$\{ \text{Jane, ...} \}$

$= F$

"=" = equality

$\{ \text{Joe, ...} \}$

$\neq F$

" \neq " = inequality

$\{ \text{Jane, Mary} \} \subseteq F$

\subseteq = all elements in set
subset

$\{ \text{Jane, Mary} \} \subset F$

\subset = proper subset
same def but not equal

"shaglerden"

$$\{Jane\} \subset F$$

$\in, \notin, =, \neq, \subseteq, \subset$ ^{credicards}



$f(A,B)$

range $\{T, F\}$

Union

$F \cup M$

Combine both sets elements

$$\{Jane\} \cup \{Jane\} = \{Jane\}$$

non-exclusive or

$$N_0 := N \cup \{0\}$$

Intersection

$F \cap M =$ only elements in both
"and"

$$F \cap M = \{Dana\}$$

No set



empty set

odd #s \cap Even #s

$$\emptyset = \{\}$$

$$= \{\}$$

$$F \cap \{Bad\} = \emptyset$$

Def. sets A, B are exclusive
if $A \cap B = \emptyset$

$$\emptyset \subset F \quad \emptyset \subseteq F \quad \emptyset \notin F$$

Difference / strategy

$$F \setminus M = \{ \text{Jane, Mary, Susan} \}$$

all elements in F not in M

$$A \cap B = \emptyset$$

$$A \setminus B = A$$

$$B \setminus A = B$$

$$A=B \Rightarrow A \cap B = A \cup B$$

$$A \subseteq B$$

$$= A \setminus B = \emptyset$$

$$\{ 2n : n \in \mathbb{Z} \} = \{ \dots, -2, 0, 2, \dots \} = \mathbb{E}$$

all element $2 \cdot n$ such that n is \mathbb{Z}

$$A = \{1, 2, 3\} \quad \mathcal{Z}^A = \{ B : B \subseteq A \} = \left\{ \begin{array}{l} \{1, 2, 3\}, A, \emptyset, \\ \{2, 3\}, \{1, 3\}, \\ \{1\}, \{2\}, \{3\} \end{array} \right\}$$

↑
powered set

$$\{3, 2\} \in \mathcal{Z}^A$$

Size AKA cardinality

$$\begin{array}{c} |A| = 3 \\ \uparrow \uparrow \\ \text{pipe operation} \end{array} \quad ||: \text{set} \rightarrow \mathbb{N}_0$$

$$|F \vee M| = 7 |F| + |B|$$

$$|F \wedge M| = 1$$

$$|F|M| = 3$$

$$|2^F| = 16$$

"counting in a heretic"

$$|S| < \infty, \\ |2^S| = 2^{|S|}$$

special set $\Omega = \text{"Universe"}$, "sample space",
"space of discourse",
"scope"

$$\Omega = F \vee M$$

$$F \subseteq \Omega$$

$$2^F \subseteq \Omega \text{ [False]}$$

$$\text{Coin flip } \Omega = \{H, T\}$$

$$\Omega = \{1, 2, 3, 4, 5, 6\}$$

what is the probability that a random name is female?
Assume $\Omega = F \cup M$

$$P(F) = \frac{|F|}{|\Omega|}$$

random - which all are equal
likely

Working definition

$$P(A) = \frac{|A|}{|\Omega|} \text{ for all } A$$