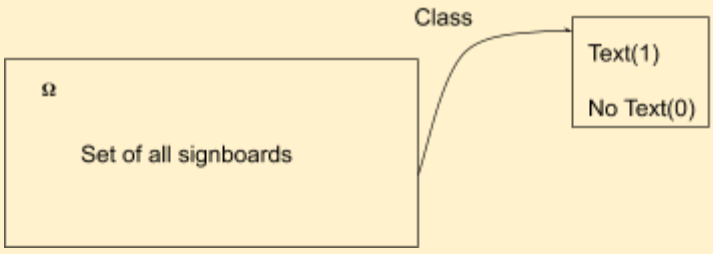
PadhAI: Probability Theory

One Fourth Labs

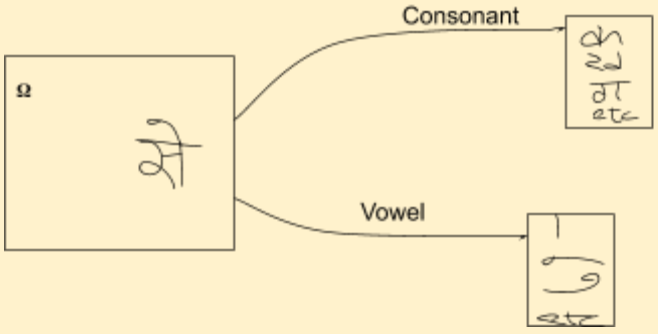
Random Variable Formal Definition

What is a random variable (formal definition)

1. A random variable is a function which maps each outcome in Ω to a value
2. In the previous example, G (or f_{grade}) maps each student in Ω to a value: A, B or C
3. The event Grade=A is a shorthand for the event
   a. $\{\omega \in \Omega : f_{grade} = A\}$
   b. In other words, All the elements such that when you apply f_{grade} the answer is A
   c. Grade is a random variable
   d. P(grade = A) = $\frac{\{\omega \in \Omega : f_{grade} = A\}}{Total\ number\ of\ students}$
   e. In the context of our example



4. This also applies to multiclass classification
   a. Mapping one Letter to its respecting vowel, and consonant.



5. Here, it would be P(Consonant=स) and P(Vowel = ी)