Example: 5 dice in a hat, choose die blindly (at random), roll it once.

$$S = \{ \underbrace{(1,1),(1,2),(1,3),(1,4)}_{\text{1st die has 4 sides}}, \underbrace{(2,1),(2,2),\dots,(2,6)}_{\text{6 outcomes for the 6-sided die}}, \underbrace{(3,1),\dots,(3,8)}_{\text{8 sided die}}, \underbrace{(4,1),\dots,(4,12)}_{\text{12 sided die}}, \underbrace{(5,1),\dots,(5,20)}_{\text{20 sided die}} \}$$

S has 50 outcomes.

The 50 outcomes are not equally likely.

If we define the random variable $X(\omega)$ as the value appearing on outcome ω, then $X(\omega) = X((i,j)) = j$.

Or we could define $Y(\omega) = Y((i,j)) = i$ as the type of the die that appears.

Notice $1 \le X \le 20$, $1 \le Y \le 5$. Often suppress the outcome in the notation, e.g. $X = j$ and $Y = i$ if (i,j) is understood to be the outcome.