



### Why

How should we talk about objects which are associated with some uncertain outcome?

### Definition

We use the language of functions. Let  $\Omega$  be a set of outcomes. An *outcome variable* (or *random variable*) is a function on a set of outcomes  $\Omega$ . We call the codomain of the function the set of *values* of the outcome variable. If the set is named  $\_$ , we call the function a  $\_$ -valued outcome variable on  $\Omega$ .

### Example: two dice

Model the outcomes of the number of pips facing up after rolling two dice with the set  $\{1, \dots, 6\}^2$ . Define the outcome variable  $s : \{1, \dots, 6\}^2 \rightarrow \{1, \dots, 12\}$  by

$$s((d_1, d_2)) = d_1 + d_2.$$

We interpret the outcome variable  $s$  as the sum of the two dice.



