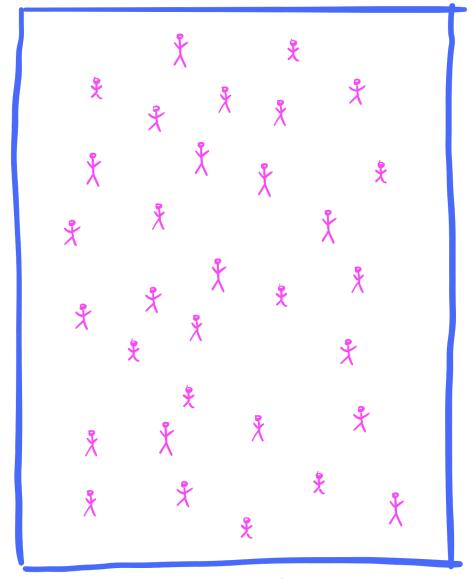
4.1. Random variables

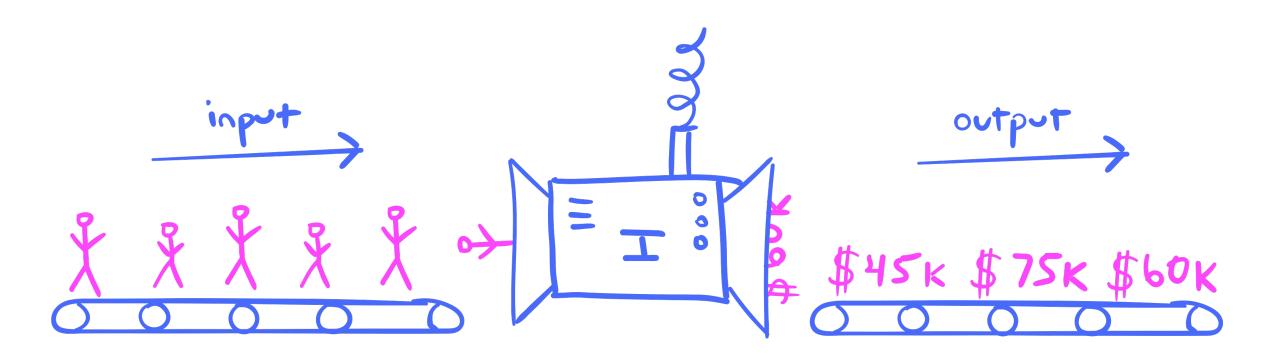
"Random variables are neither random, nor are they variables."

- Someone

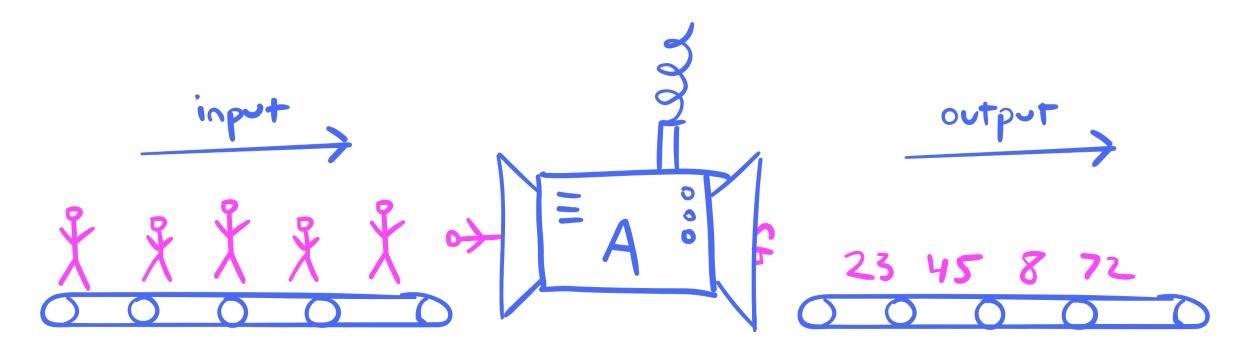


population

annual income machine



age machine



$$I(X) = $70k$$

$$A(X) = 3Z$$



Definition 4.1

Let S be a probability space. A *random variable* on S is a function $X:S o\mathbb{R}$.



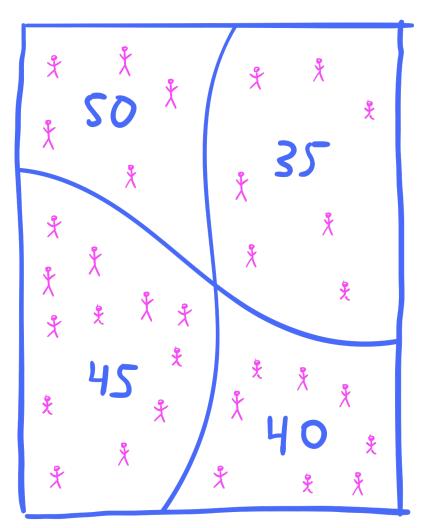
Problem Prompt

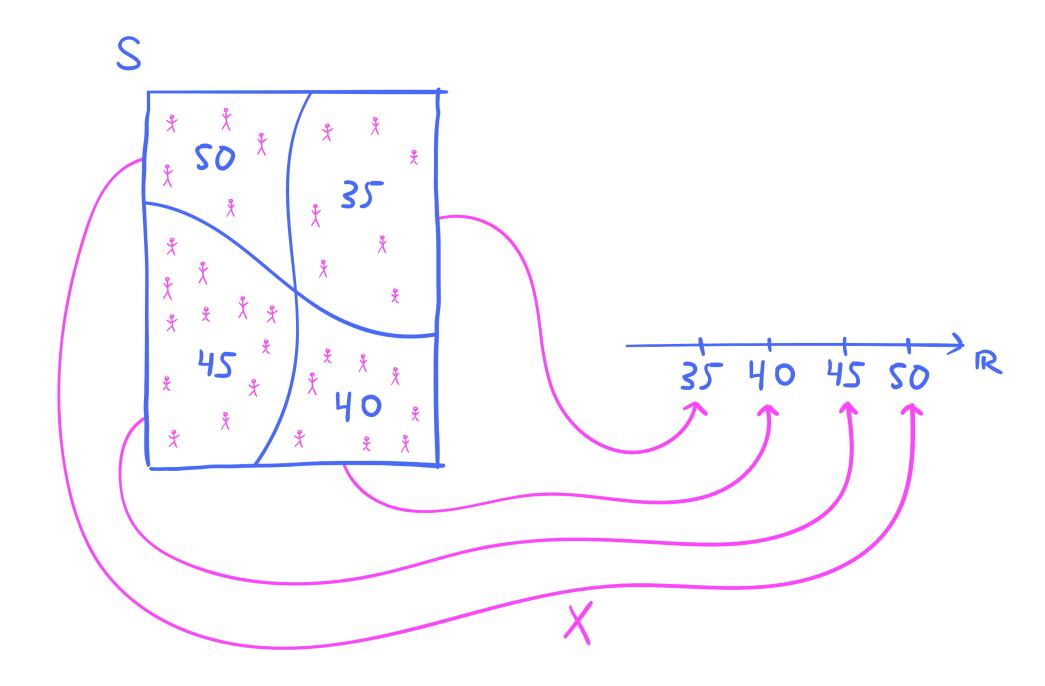
Let's get some practice with random variables! Do problems 1-4 on the worksheet.

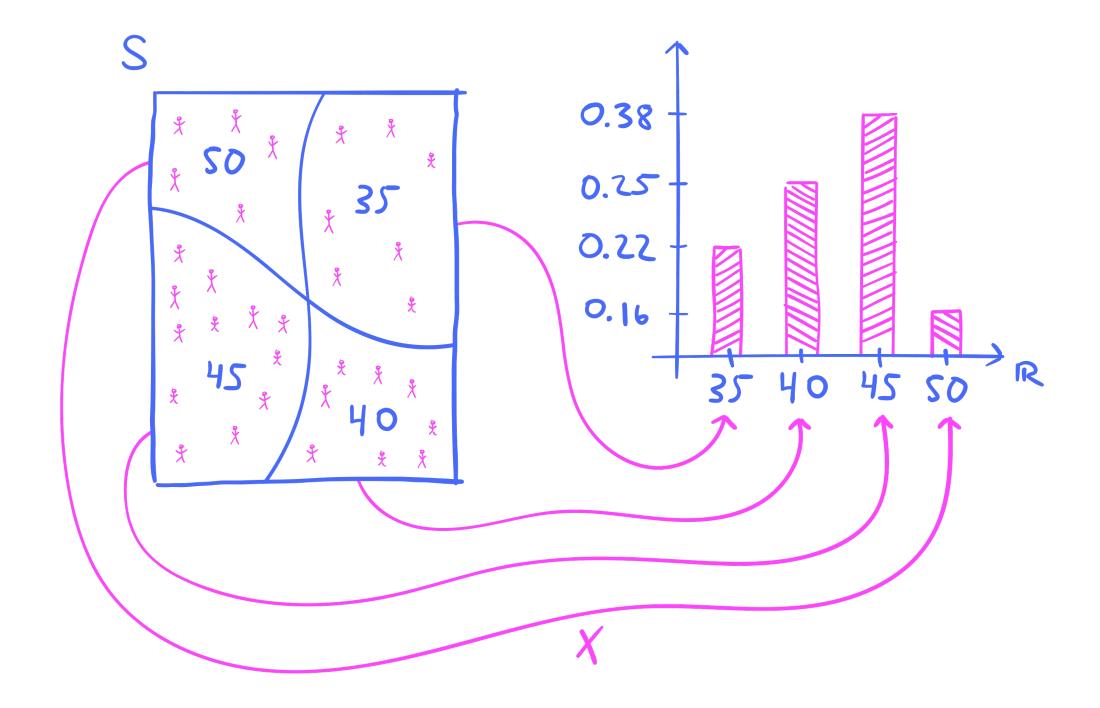
4.2. Probability measures of random variables

Pmeasures P_x measures probability here probability here

S







Definition 4.2

Let $X:S o \mathbb{R}$ be a random variable on a probability space S with probability measure P. We define the *probability measure of X*, denoted P_X , via the formula

$$P_X(A) = P(\{s \in S : X(s) \in A\}),$$
 (4.2)

for all events $A \subset \mathbb{R}$.



Problem Prompt

Let's practice! Have a go at problems 5-7 on the worksheet.