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$B_1 = [\qquad)$

$B_2 = [\qquad)$

$B_3 = [\qquad)$

$\vdots$

$m(B_n) = \frac{1}{2}$, $B_1, B_2, B_3, \ldots$ are independent.

sequences with 1 in n^{th} place $\longrightarrow A_1, A_2, \ldots$ are independent

We can discount the 2-representation guys.

Moral: tossing a coin $\mathbb{N}$-many times $\approx$ choosing a random $x \in [0,1]$ (probabilistically).

eg toss a biased coin until it lands heads:

$P(\#$ of tosses required is odd$) = ?$

Solution: Let p be the probability of heads on any toss. (assume $0 < p < 1$).

$$? = p + (1-p)^2 p + (1-p)^4 p + \ldots$$

$$= p \sum_{k=0}^{\infty} (1-p)^{2k} = \frac{p}{2p - p^2} = \frac{1}{2-p}.$$

$\mathrm{inj}(A, B) =$ set of injections from A to B.

$\forall n \in \mathbb{Z}_{\geq 0}$, $\forall k \leq n$, if $|A| = k$ & $|B| = n$,

$$|\text{inj}(A,B)| = (n)_k = n\cdot(n-1)\cdot(n-2)\cdot\cdots\cdot(n-(k-1))$$

"n permute k"

The number of permutation of n objects, k at a time.