Probability and `atlas-preamble`

Responsible for `probability` preset: Tassilo Schwarz[*]

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1 Introduction

To use probability theory macros in your document with `atlas-preamble`, use the `probability` preset option:

`\usepackage[probability]{atlas-preamble}`

2 Basic probability notation

The most commonly used ones are $\mathbb{P}[X + Y]$ and i.i.d. The default `\Pr` command (Pr) is accessible via the alias `\oldPr`. The new `\Pr` command can also be used with an argument to put an event in square brackets. The `\iid` command solves spacing and punctuation problems after `\iid` automatically: You can either end the sentence afterwards or continue writing; the package will work everything out for you:

- Let X and Y be i.i.d. This is a new sentence.
- Let X be i.i.d. and Y be i.i.d.

Caution: use `\iid` only in text mode.

Other elementary probability notation includes:

Expectation	Variance	Covariance	r-th Factorial Moment
`\E{a}{a+b}`	`\Var{a}{a+b}`	`\Cov{a}{A+u v^T}`	`\Efact{r}{X}`
$\mathbb{E}_a[a+b]$	$\mathrm{Var}_a[a+b]$	$\mathrm{Cov}_a\left(A + uv^T\right)$	$\mathbb{E}_r[X]$

If only one argument is given, the subscript will be left out:

`\E{a+b}`	`\Var{a+b}`	`\Cov{A+u v^T}`	(not available)
$\mathbb{E}[a+b]$	$\mathrm{Var}[a+b]$	$\mathrm{Cov}\left(A + uv^T\right)$	(not available)

Parenthesis and brackets scaling is automatic according to the content.

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[*]Email: `lastname@maths.ox.ac.uk`

3   Probability Distributions

The following macros for probability distributions are available:

`\Bernoulli{p}`	`\Bin{n}{p}`	`\Po{c}`
Bernoulli (p)	Bin (n, p)	Po (c)