Using the `Pareto` Package

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1 Introduction

The `pareto` package includes the three of the standard distribution functions for the Pareto distribution: `dpareto()` to calculate the density, `ppareto()` to the cdf and `qpareto()` to calculate the inverse cdf.

2 Simple Examples

Some simple examples:

```
> dpareto(2, 1, 1)

[1] 0.25

> ppareto(2, 1, 1)

[1] 0.5

> qpareto(0.5, 1, 1)

[1] 2
```

The functions also support returning or accepting log probabilities:

```
> dpareto(2, 1, 1, TRUE)

[1] -1.386294

> ppareto(2, 1, 1, TRUE)

[1] 0.5

> qpareto(0.5, 1, 1, TRUE)

[1] 2
```

3 Vectorized Examples

The functions are also designed to accept vector arguments with lengths greater than 1 element. When provided with this input, the functions will recycle the shorter vectors until they match the longest vector in the input. This is the same as the behavior of other density functions, such as those of the gamma family.

```
> dpareto(1:3, 1:2, 1:2)

[1] 0.0000000 0.0000000 0.1111111

> ppareto(1:4, 1, 1)
```

	x	dpareto(x)	ppareto(x)
1	1.00	0.00	0.00
2	2.00	0.25	0.50
3	3.00	0.11	0.67
4	4.00	0.06	0.75
5	5.00	0.04	0.80
6	6.00	0.03	0.83
7	7.00	0.02	0.86
8	8.00	0.02	0.88
9	9.00	0.01	0.89
10	10.00	0.01	0.90

Table 1: The density and cdf of the Pareto(1, 1) distribution

```
[1] 0.0000000 0.5000000 0.6666667 0.7500000
```

```
> qpareto(seq(0.1, 0.9, 0.2), 1, 1)
```

```
[1]  1.111111  1.428571  2.000000  3.333333 10.000000
```

The density and cdf of the Pareto(1, 1) distribution is shown in Table 1. A graph of these results is in Figure 1.

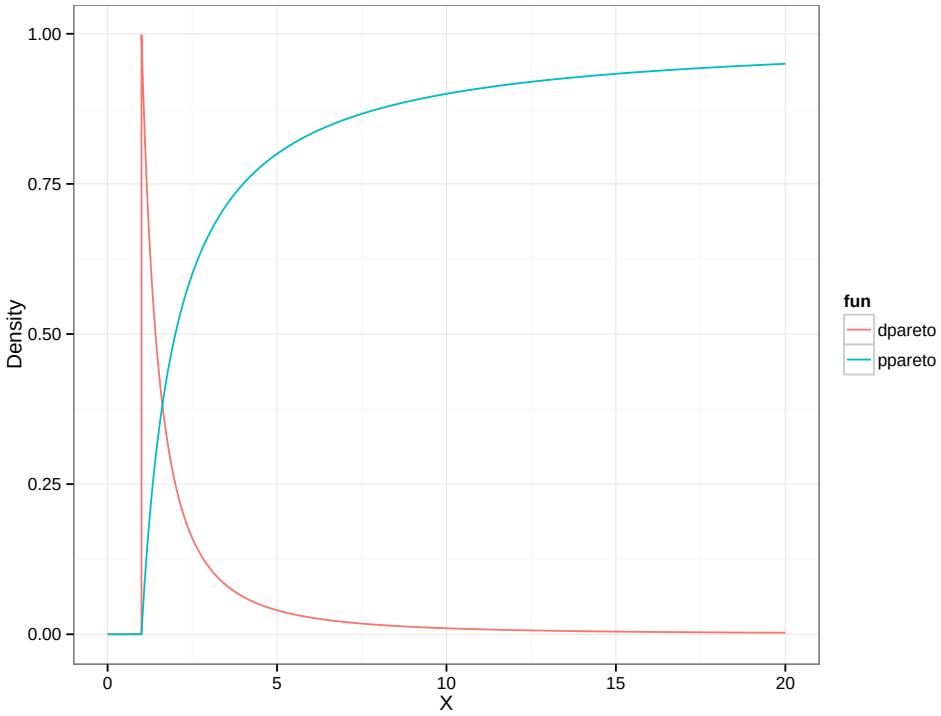

Figure 1: Plots of the Pareto(1, 1) density and cumulative density functions.