The Geometric Probability Distribution

- Used for binary data (1 or 0; success or failure, etc).
- In a sequence of trials, the trial yielding the first success (all previous trials ending in failure) has a geometric distribution.
- The assumption required is that separate trials are independent and the probability of success p is the same in every trial.
- The probability of failure in each trial is $1 - p$.

The Geometric Probability Distribution

```
# p is the probability of success
dgeom(X, prob = p)
# log of the probability instead
dgeom(X, prob = p, log=TRUE)
```

The Geometric Probability Distribution

In probability theory and statistics, the **geometric distribution** is either of two discrete probability distributions:

- The probability distribution of the number X of Bernoulli trials needed to get one success, supported on the set { 1, 2, 3, ...}
- The probability distribution of the number $Y = X - 1$ of failures before the first success, supported on the set { 0, 1, 2, 3, ... }

Which of these one calls "the" geometric distribution is a matter of convention and convenience.

The Geometric Probability Distribution

```
> dgeom(0,0.25)
[1] 0.25
> dgeom(1,0.25)
[1] 0.1875
> pgeom(1,0.25)
[1] 0.4375
>
```