

Generating Random Data

- Built-in statistical distribution functions

R has several built-in statistical distributions. For each distribution four functions are available,

- r: random number generator rbinom (.)
- d: density function $f(x)$ dbinom () = $P[X=x]$
- p: cumulative distribution function pbinom ()
- q: quantile function qbinom ()

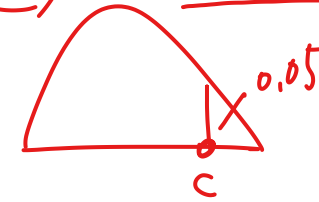
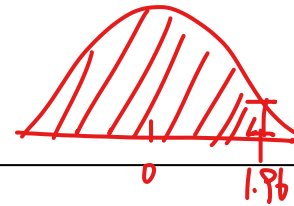
Each latter can be added as a prefix to any of the R distribution names

below. Distribution	R Name	Additional Arguments
✓ <u>binomial</u>	<u>binom</u>	size, prob
chi-squared	chisq	df
exponential	exp	rate
F	f	df1, df2
<u>normal</u>	<u>norm</u>	mean, sd
Poisson	pois	lambda
Student's t	t	df
uniform	unif	min, max

$qnorm(0.05, 0.1)$

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$qnorm(0.05, 0.1, \text{lower.tail}=\text{FALSE})$



```
> dnorm(1.96, mean=0, sd=1)
```

```
[1] 0.05844094 f(1.96)
```

```
> dnorm(1.96)
```

```
[1] 0.05844094 ✓
```

```
> pnorm(1.96, mean=0, sd=1)
```

```
[1] 0.9750021
```

```
> pnorm(1.96, mean=0, sd=1, lower.tail=FALSE)
```

```
[1] 0.0249979
```

```
> qnorm(0.975, 0, 1)
```

```
[1] 1.959964
```

```
> rnorm(5, mean=2, sd=1)
```

```
[1] 4.5283366 2.5490967 2.2382129 0.9511069 3.2947633
```

