Normal Distribution

R Handout

Derek H. Ogle

Wood-Burning Example

Suppose that the amount of wood that I burn per day is approximately normally distributed with a mean of 16 ft^3 and a standard deviation of 4 ft^3. Use this information to answer the questions below.

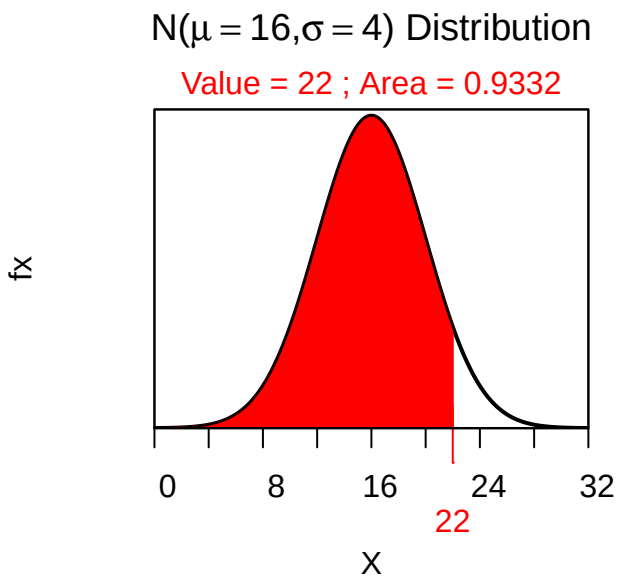
- What is an individual?
- What is the variable and what type of variable is it?
- On what proportion of days do I burn less than 22 ft^3 of wood?
- On what proportion of days do I burn more than 15 ft^3 of wood?
- On what proportion of days do I burn between 11 and 26 ft^3 of wood?
- What is the amount of wood burned per day such that I burn less than that amount on 10% of the days?
- What is the amount of wood burned per day such that I burn more than that amount on 20% of the days?
- What are the most common 50% of amounts of wood burned per day?

Load NCStats Package

```
> library(NCStats)
```

Forward, Less-Than

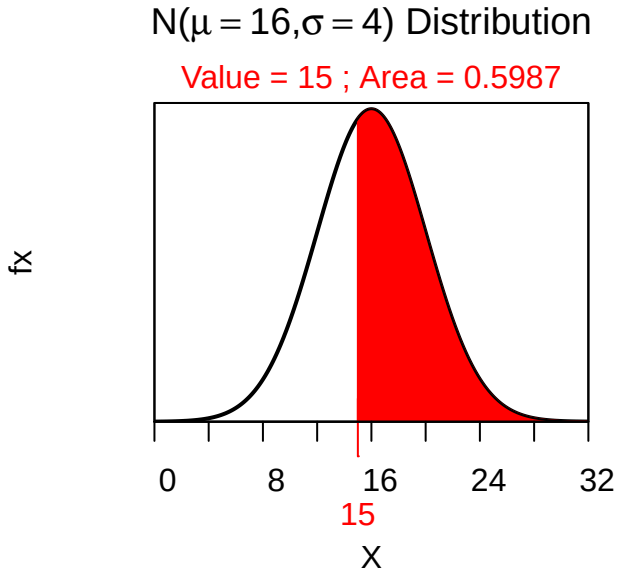
```
> ( distrib(22,mean=16,sd=4) )
```




```
[1] 0.9331928
```

Forward, Greater-Than

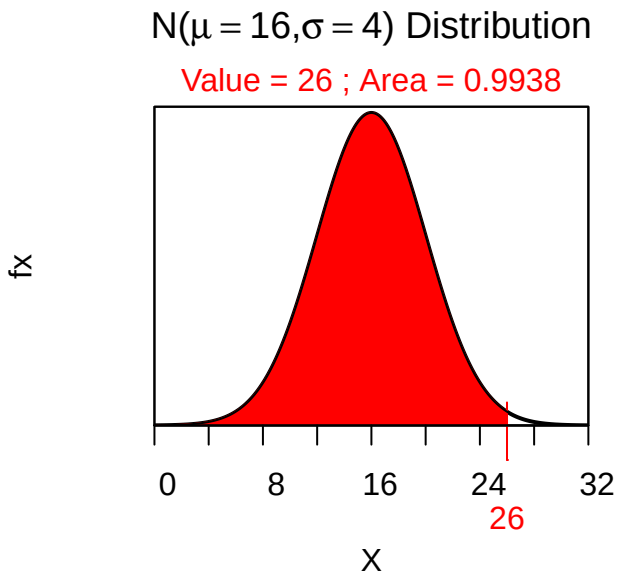
```
> ( distrib(15,mean=16,sd=4,lower.tail=FALSE) )
```



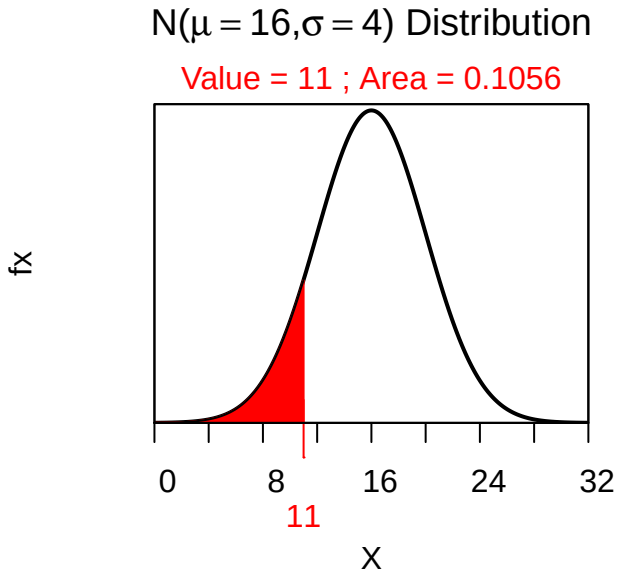

```
[1] 0.5987063
```

Forward, Between

```
> ( ab <- distrib(26,mean=16,sd=4) )
```




```
[1] 0.9937903
> ( a <- distrib(11,mean=16,sd=4) )
```

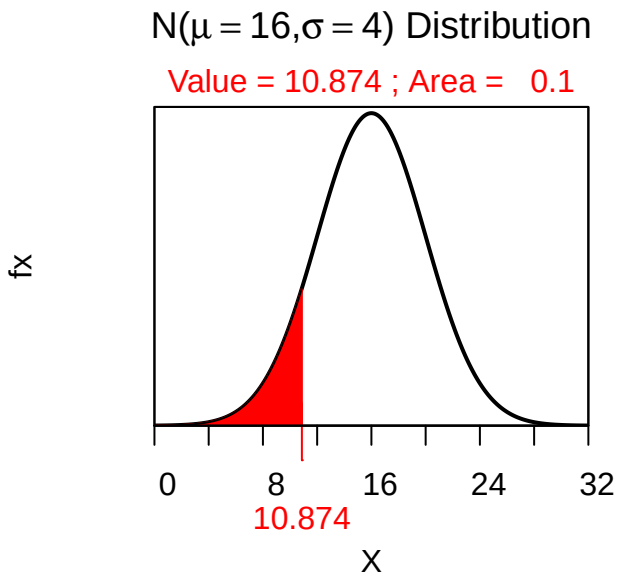



```
[1] 0.1056498
> ab-a
```

```
[1] 0.8881406
```

Reverse, Less-Than}

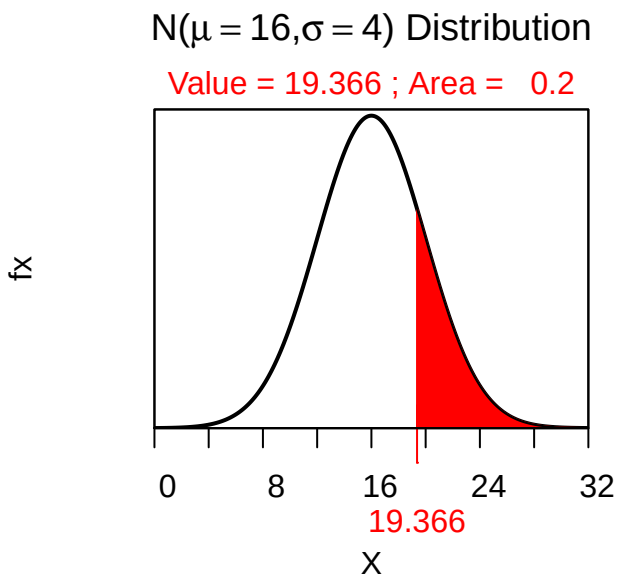
```
> ( distrib(0.1,mean=16,sd=4,type="q") )
```




```
[1] 10.87379
```

Reverse, Greater Than

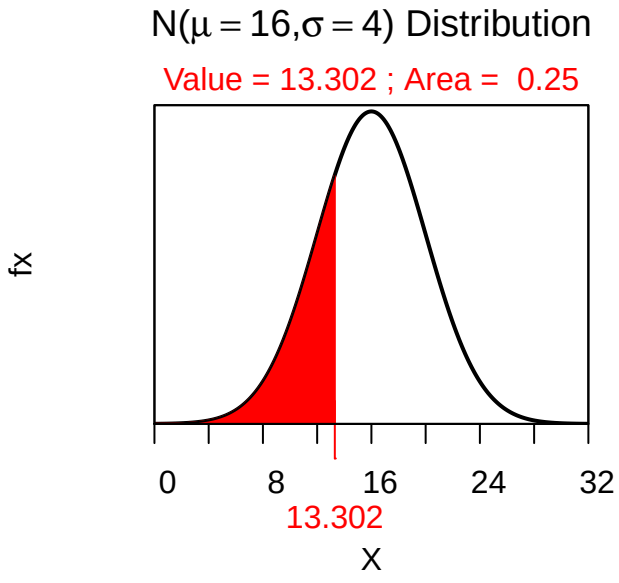
```
> ( distrib(0.20,mean=16,sd=4,type="q",lower.tail=FALSE) )
```




```
[1] 19.36648
```

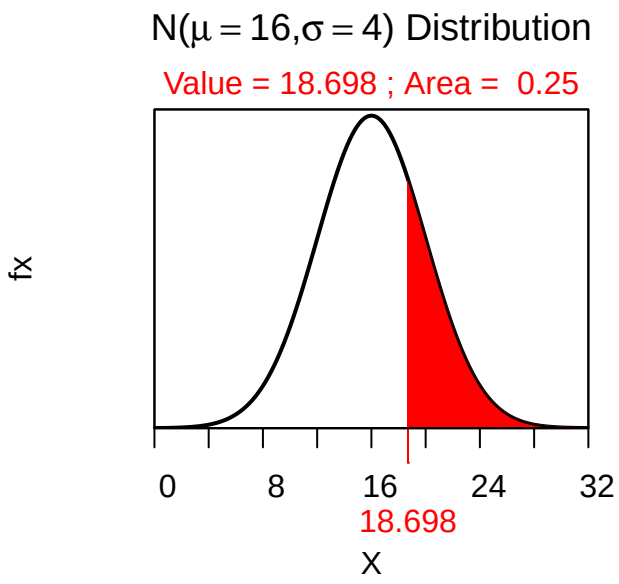
Reverse, Between

```
> ( distrib(0.25,mean=16,sd=4,type="q") )
```




```
[1] 13.30204
```

```
> ( distrib(0.25,mean=16,sd=4,type="q",lower.tail=FALSE) )
```


N(μ = 16,σ = 4) Distribution
Value = 18.698 ; Area = 0.25
fx
0
8
16
24
32
18.698
X

```
[1] 18.69796
```