Findbeta extensions ver 1

Konstantinos Pateras

2023-04-05

Updated basic findbeta

```
library(PriorGen)
```

```
## Loading required package: rootSolve
```

```
## Loading required package: nleqslv
```

```
## Warning: package 'nleqslv' was built under R version 4.2.2
```

```
fb_per0=findbeta(themedian = 0.5,lower.v = T,percentile = 0.999,percentile.value = 0.999)
fb_per0
```

```
## The desired Beta distribution that satisfies the specified conditions is: Beta( 1 , 1 )
##  Verification: The percentile value 1 corresponds to the 0.999 th percentile
```

```
print(fb_per0)
```

```
## [1] "The desired Beta distribution that satisfies the specified conditions is: Beta( 1 , 1 ) \n Veri
```

```
#findbeta(themode = 0.5,lower.v = T,percentile = 0.80,percentile.value = 0.95)
fb_per=findbeta(themean = 0.5,lower.v = T,percentile = 0.90,percentile.value = 0.95)
fb_per
```

```
## The desired Beta distribution that satisfies the specified conditions is: Beta( 0.67 , 0.67 )
##  Verification: The percentile value 0.95 corresponds to the 0.9 th percentile
```

```
fb_per$parameters
```

```
##         a         b
## 0.6658199 0.6658199
```

```
fb_per$summary
```

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 0.0000004 0.1923723 0.4975507 0.4977591 0.8030204 0.9999862
```

```
fb_per$input
```

```
##          themean       percentile percentile.value
##             0.50             0.90             0.95
```

Raw findbeta (mean/median/mode/variance/range input)

```
source("~/GitHub/PriorGen-1/R/findbeta_raw.r")
findbeta_raw(themedian = 0.5,therange = c(0,1))
```

```
## The desired Beta distribution that satisfies the specified conditions is: Beta( 1 , 1 )
##  Verification: The percentile value 1 corresponds to the 1 th percentile
```

```
#findbeta_raw(themode = 0.5,therange = c(0,1))
fb_raw=findbeta_raw(themean = 0.8,thevariance = 0.2)
fb_raw$parameters
```

```
##        a        b
## 5.157879 1.289470
```

```
fb_raw$summary
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.1156  0.7171  0.8315  0.8004  0.9130  0.9997
```

```
fb_raw$input
```

```
##                   themean scalemetric_var_or_range
##                 0.8000000                0.0408861
```

Abstract findbeta (General statements input)

```
source("~/GitHub/PriorGen-1/R/findbeta_abstract.r")
findbeta_abstract(themean.cat = "Low",thevariance.cat = "High")
```

```
## The desired Beta distribution that satisfies the specified conditions is: Beta( 2.14 , 4.99 )
##  Verification: The percentile value 0.1 corresponds to the 0.09175 th percentile
```

```
#findbeta_abstract(themean.cat = "Very low",thevariance.cat = "Low")
fb_abstract=findbeta_abstract(themean.cat =  "Low",thevariance.cat = "High")
fb_abstract$parameters
```

```
##        a        b
## 2.136687 4.985604
```

```
fb_abstract$summary
```

```
##     Min.  1st Qu.   Median     Mean  3rd Qu.     Max.
## 0.004841 0.178599 0.281261 0.301769 0.404847 0.869414
```

```
fb_abstract$input
```

```
##          themean      scalemetric percentile.value
##          0.30000          0.09175          0.99900
```

Panel findbeta (Vector input)

```
source("~/GitHub/PriorGen-1/R/findbeta_panel.r")
#findbeta_panel(themedian.vec = c(0.2,0.02,0.5,0.03,0.04,0.05))
findbeta_panel(themode.vec = c(0.2,0.02,0.5,0.03,0.04,0.05))
```

```
## The desired Beta distribution that satisfies the specified conditions is: Beta( 4.57 , 22.94 )
##  Verification: The percentile value 0.5 corresponds to the 0.9999 th percentile
```

```
fb_panel=findbeta_panel(themean.vec = c(0.2,0.02,0.5,0.03,0.04,0.05))
fb_panel$parameters
```

```
##        a        b
## 11.90200 73.11232
```

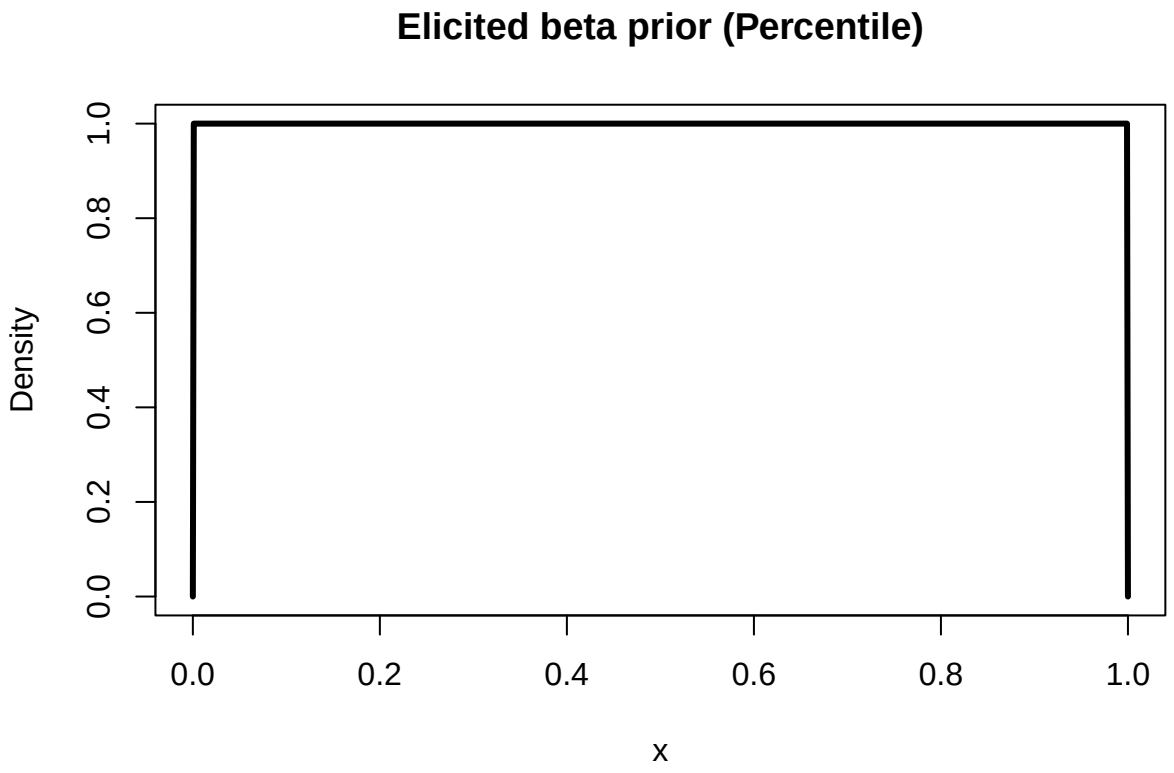
```
fb_panel$summary
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
## 0.04516 0.11378 0.13739 0.14026 0.16347 0.30894
```

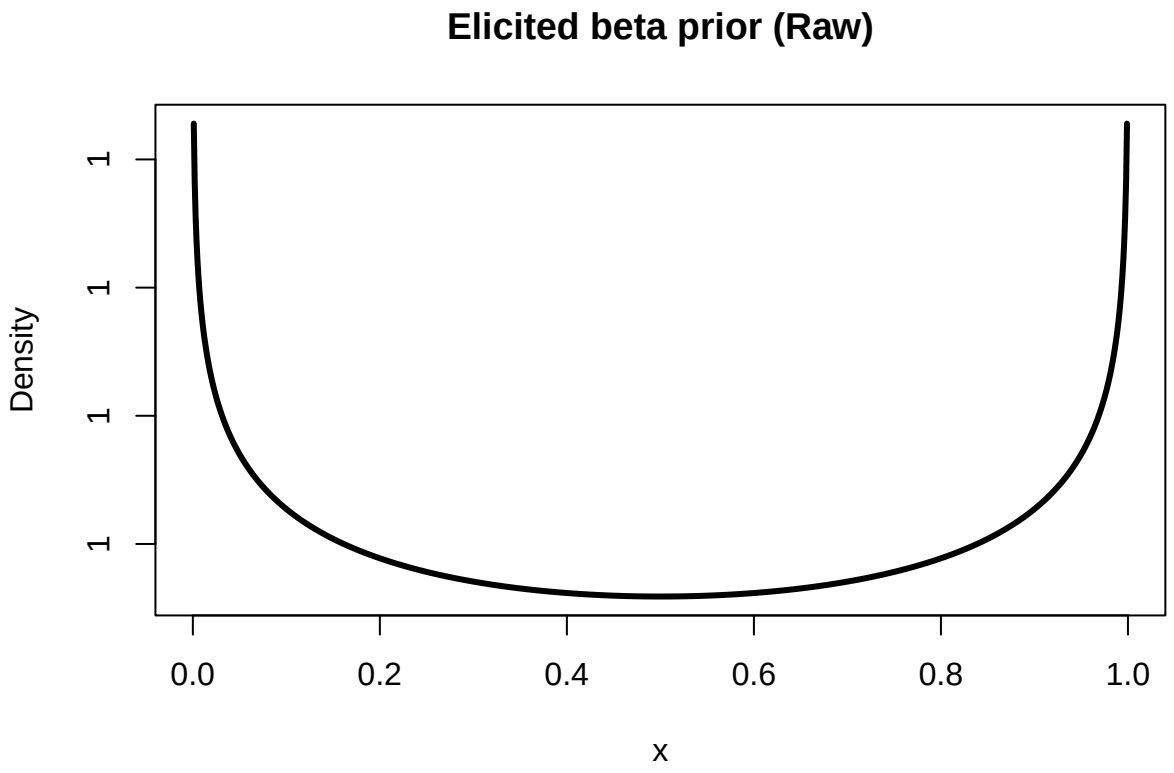
```
fb_panel$input
```

```
##          themean       percentile       scalevalue percentile.value
##        0.1400000        0.9999000        0.0355600        0.2773494
```

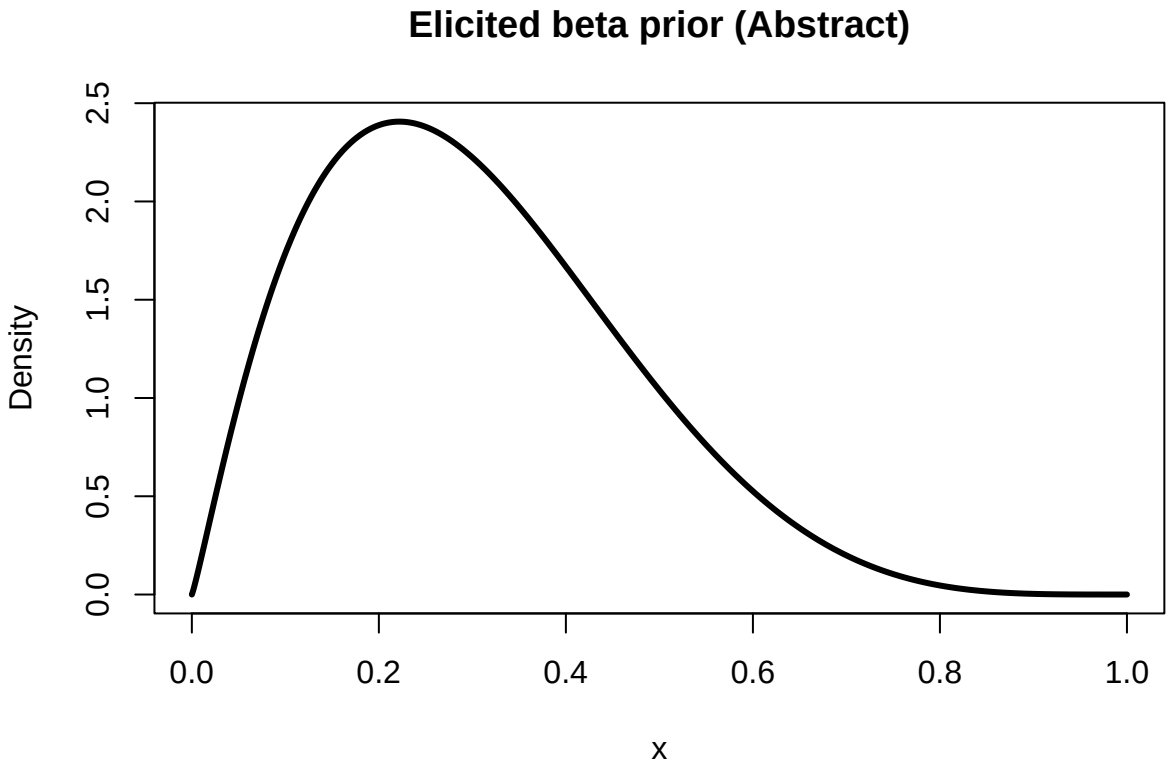
```r
source("~/GitHub/PriorGen-1/R/findbeta_plot.r")
fb_pr=findbeta(themean = 0.5,lower.v = T,percentile = 0.999,percentile.value = 0.999)
plot(fb_pr,main="Elicited beta prior (Percentile)",ylab = "Density",lwd=3,type="l")
```



```r
source("~/GitHub/PriorGen-1/R/findbeta_plot.r")
fb_raw=findbeta_raw(themean = 0.5,thevariance = 0.5)
plot(fb_raw,main="Elicited beta prior (Raw)",ylab = "Density",lwd=3,type="l")
```



```
source("~/GitHub/PriorGen-1/R/findbeta_plot.r")
fb_abstract=findbeta_abstract(themean.cat = "Low",thevariance.cat = "High")
plot(fb_abstract,main="Elicited beta prior (Abstract)",ylab = "Density",lwd=3,type="l")
```



```
source("~/GitHub/PriorGen-1/R/findbeta_plot.r")
source("~/GitHub/PriorGen-1/R/findbeta_lines.r")
fb_panel1=findbeta_panel(themean.vec = c(0.2,0.02,0.5,0.03,0.04,0.05))
fb_panel2=findbeta_panel(themean.vec = c(0.2,0.02,0.5,0.4,0.04,0.05))
plot(fb_panel1,main="Elicited beta prior  (Panel)",ylab = "Density",lwd=3,lty=1,type="l")
lines(fb_panel2,lty=2,lwd=3,type="l")
```