Shade the feasible region with abline in R

I have straight lines as constraints and I seek to shade the feasible region.

I have used abline to plot my lines but i cannot shade in the polygon. This is what i have so far.

I am fairly new to R.

```
plot(c(0, 2), c(0, 2), type='n')

abline(-1/4, 6)
abline(1/2,7)
abline(2,-8)
abline(1,-3)
```

r plot region

edited Mar 18 at 21:25

beresfordt

3,149 7 20 32

asked Mar 11 '14 at 22:36

user3407737

6

2 Answers

Use `polygon` to draw the polygon and shade it. For example:

```
plot(c(0, 3), c(0, 3), type = 'n')
x <- c(1, 2, 2, 1) # The x-coordinate of the vertices
y <- c(2, 1, 2, 1) # The y-coordinate of the vertices
polygon(x, y, col = 'grey')
```

will create and color grey a bow-tie shaped polygon.

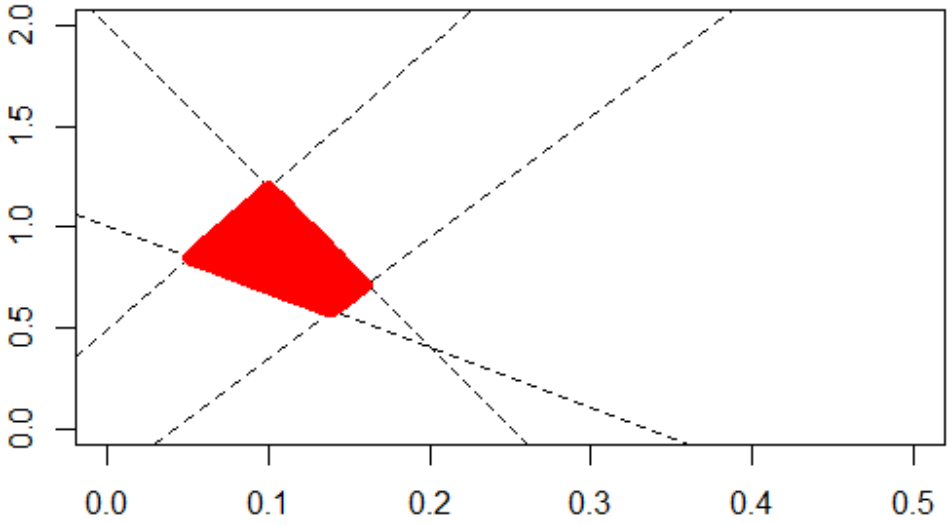
edited Mar 12 '14 at 1:09

Ben Bolker
95.4k 6 131 222

answered Mar 12 '14 at 0:30

Christopher Louden
4,056 1 9 24

So here's one way that does not require calculating the corners:




```
plot(c(0, .5), c(0, 2), type='n')
abline(-1/4, 6, lty=2)
abline(1/2,7, lty=2)
```

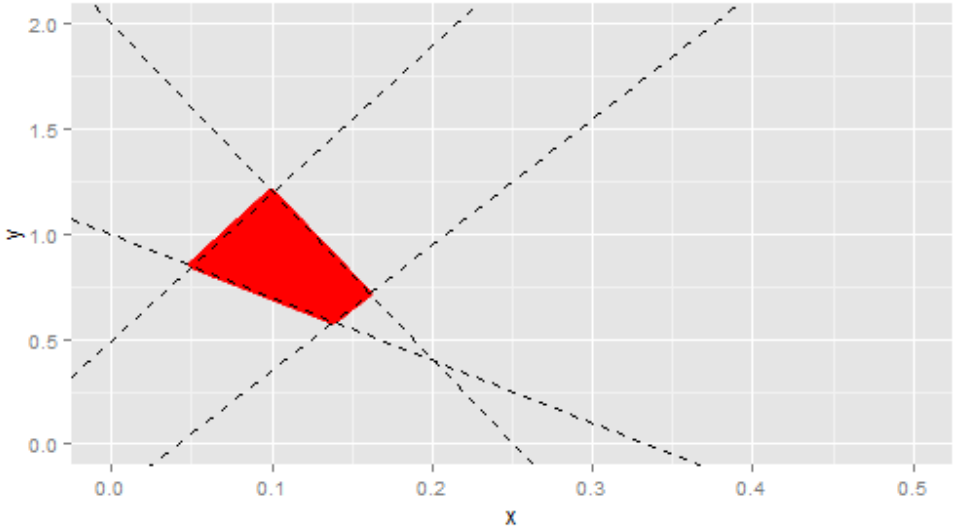
```
abline(2,-8, lty=2)
abline(1,-3, lty=2)

conditions <- function(x,y) {
  c1 <- (y > -1/4 + 6*x)
  c2 <- (y <  1/2 + 7*x)
  c3 <- (y <    2 - 8*x)
  c4 <- (y >    1 - 3*x)
  return(c1 & c2 & c3 & c4)
}

x <- seq(0,0.5,length=1000)
y <- seq(0,2,length=1000)
z <- expand.grid(x=x,y=y)
z <- z[conditions(z$x,z$y),]
points(z, col="red")
```

And the same thing using `ggplot`

```
library(ggplot2)
ggplot(z, aes(x,y))+geom_point(colour="red", alpha=.5)+
  geom_abline(intercept=-1/4,slope=6,  linetype=2)+
  geom_abline(intercept=1/2, slope=7,  linetype=2)+
  geom_abline(intercept=2,   slope=-8, linetype=2)+
  geom_abline(intercept=1,   slope=-3, linetype=2)+
  xlim(0,0.5)+ylim(0,2)
```



edited Mar 12 '14 at 6:19

answered Mar 12 '14 at 6:13

jlhoward

35.8k 3 23 58