How to plot a plane from an equation in R

Asked 6 years ago Active 2 years, 8 months ago Viewed 11k times

4

I've been tinkering with the RGL package to figure out how to plot a plane from an equation in R, to no avail.

For example, I would like to visualize the following plane:

```
1x + 0y + 0z = 2
0x + 1y + 0z = 3
0x + 0y + 1z = 4
```

It seems the rgl's planes3d function only adds a plane to an existing 3D plot.

r 3d visualization rgl Edit tags

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edited Jun 21 '15 at 2:39

asked Jun 21 '15 at 2:08

matsuo_basho

2,151 7 21 40

What did you try so far? Please add some code to your question. – user3710546 Jun 21 '15 at 2:12

2 The system of equations you provided is a single point, unless all three are independent and make up three separate planes. – Max Candocia Jun 21 '15 at 2:56

3 Answers

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This post is hidden. It was deleted 2 years ago by ChrisF ♦.

Im new to using R. could you please help. How can I create a perspective grid titled at 45 degrees. step by step. Thank you.

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answered Nov 13 '18 at 12:06

khay

1

1 This does not provide an answer to the question. You can search for similar questions, or refer to the related and linked questions on the right-hand side of the page to find an answer. If you have a related but different question, ask a new question, and include a link to this one to help provide context. See: Ask questions, get answers, no distractions – Suraj Rao Nov 13 '18 at 12:07

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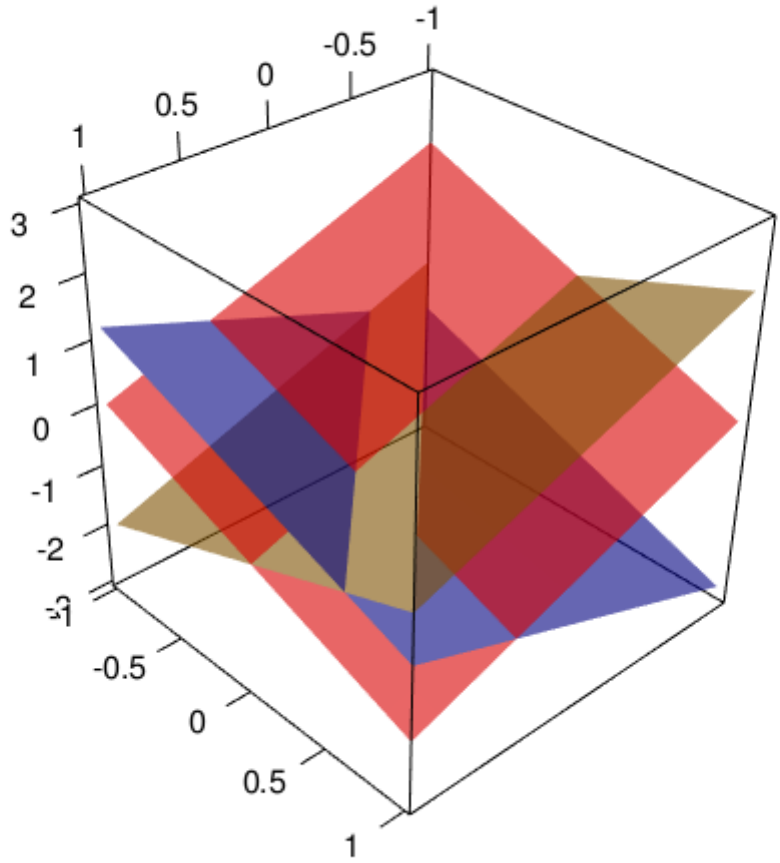
Here is a simple example:

```
library(rgl)
# Create some dummy data
dat <- replicate(2, 1:3)

# Initialize the scene, no data plotted
plot3d(dat, type = 'n', xlim = c(-1, 1), ylim = c(-1, 1), zlim = c(-3, 3), xlab = '',
ylab = '', zlab = '')

# Add planes
planes3d(1, 1, 1, 0, col = 'red', alpha = 0.6)
planes3d(1, -1, 1, 0, col = 'orange', alpha = 0.6)
planes3d(1, -1, -1, -0.8, col = 'blue', alpha = 0.6)
```

Which gives the following result.

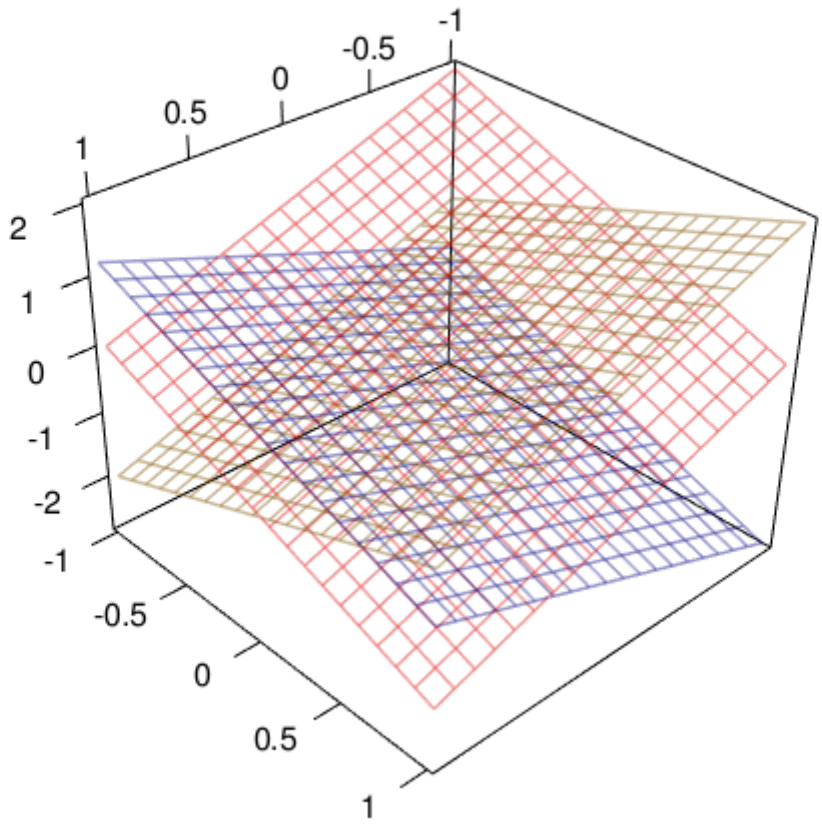


As you can see, it is quite hard to understand the spatial structure from such a plot, but the interactivity of course helps. Alternatively you can plot the planes as wireframes, which will sometimes help in understanding the spatial structure:

```
# Evaluate planes
n <- 20
x <- y <- seq(-1, 1, length = n)
region <- expand.grid(x = x, y = y)

z1 <- matrix(-(region$x + region$y), n, n)
z2 <- matrix(-region$x + region$y, n, n)
z3 <- matrix(region$x - region$y - 0.8, n, n)

surface3d(x, y, z1, back = 'line', front = 'line', col = 'red', lwd = 1.5, alpha = 0.4)
surface3d(x, y, z2, back = 'line', front = 'line', col = 'orange', lwd = 1.5, alpha =
0.4)
surface3d(x, y, z3, back = 'line', front = 'line', col = 'blue', lwd = 1.5, alpha =
0.4)
axes3d()
```



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answered Jul 13 '15 at 11:23

Lars Lau Raket

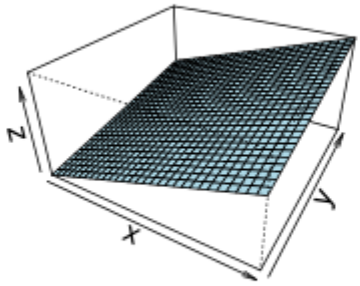
1,586 15 30

3

If you want to plot, e.g., a plane defined by the equation `2*x+y-z-3=0`, you could do this in the following way:

```
x <- y <- seq(-10, 10, length= 30)
f <- function(x,y){ z <- x*2 + y -3 }
z <- outer(x,y,f)
persp(x, y, z, theta = 30, phi = 30, expand = 0.5, col = "lightblue")
```

For more examples see `?persp` .



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answered Jun 21 '15 at 6:11

RHertel
21.7k 5 34 55

RHertel, that is quite helpful and is a great start. Now, what I'm really looking for is the ability to plot a couple of planes (for the purposes of visualizing where they meet, etc).. It looks like the persp function doesn't allow me to add another plane. Additionally, I would ideally like to be able to see the central axes labeled, as well as ability to rotate the image (as the rgl package allows). Thanks. – matsuo_basho Jun 21 '15 at 15:55