

R Notebook

```
# max delay of response
max.response = 40

# init
a1 = matrix(c(0.5,0.1,0,0.5), 2, 2)
a2 = matrix(c(0,0.1,-0.9,0.2), 2, 2)
b = array(NA, c(max.response,2,2))

# first steps
b0 = matrix(c(1,0,0,1), 2, 2)
b[1,,] = a1%*%b0
b[2,,] = a1%*%b[1,,] + a2%*%b0

# rest
for (i in 3:max.response) {
  b[i,,] = a1 %*% b[i-1,,] + a2 %*% b[i-2,,]
}

for (i in 0:10) {
  print(b[i,,])
}
```

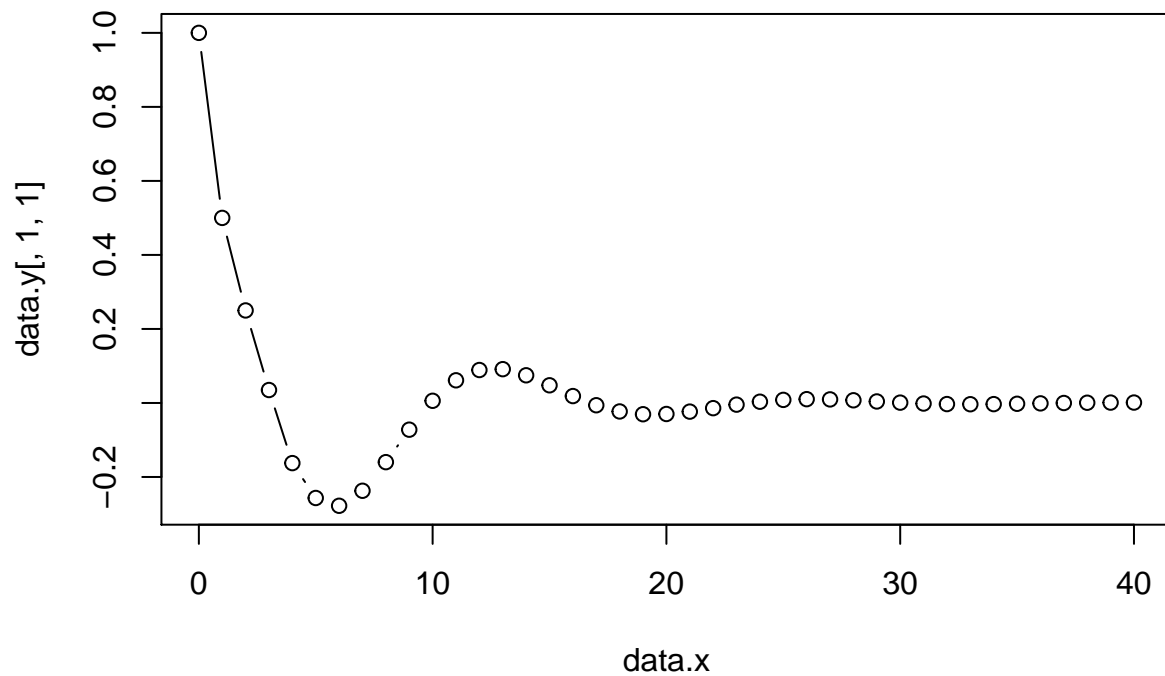
```
## , , 1
##
##      [,1] [,2]
##
## , , 2
##
##      [,1] [,2]
##
##      [,1] [,2]
## [1,]  0.5  0.0
## [2,]  0.1  0.5
##      [,1] [,2]
## [1,] 0.25 -0.90
## [2,] 0.20  0.45
##      [,1] [,2]
## [1,] 0.035 -0.900
## [2,] 0.195  0.235
##      [,1] [,2]
## [1,] -0.1625 -0.8550
## [2,]  0.1660  0.0275
##      [,1] [,2]
## [1,] -0.25675 -0.63900
## [2,]  0.10925 -0.11475
##      [,1] [,2]
## [1,] -0.277775 -0.344250
## [2,]  0.045900 -0.201275
##      [,1] [,2]
## [1,] -0.2372125 -0.0688500
## [2,] -0.0086525 -0.2219125
```

```
##           [,1]      [,2]
## [1,] -0.1599162  0.1467225
## [2,] -0.0466450 -0.1925213
##           [,1]      [,2]
## [1,] -0.07217087  0.2730825
## [2,] -0.06476588 -0.1328559
##           [,1]      [,2]
## [1,]  0.005895063  0.30981038
## [2,] -0.064920650 -0.06295169

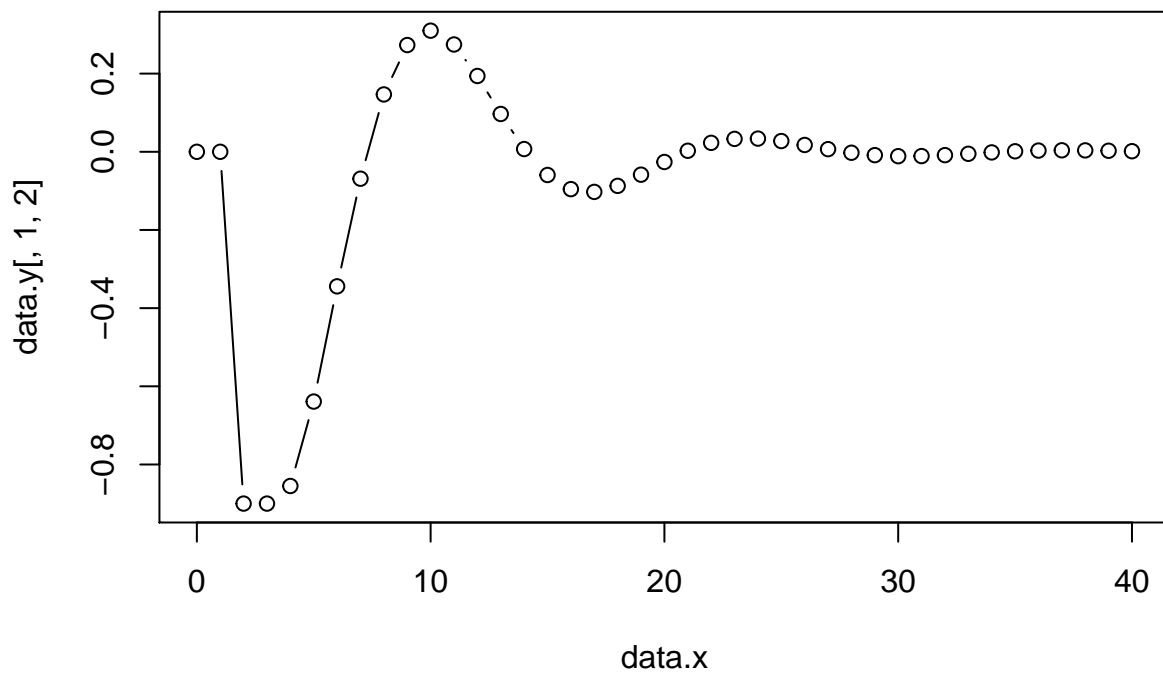
data.x = 0:max.response

data.y = array(NA, c(max.response+1,2,2))
data.y[1,,] = b0
data.y[2:(max.response+1),,] = b[1:max.response,,]

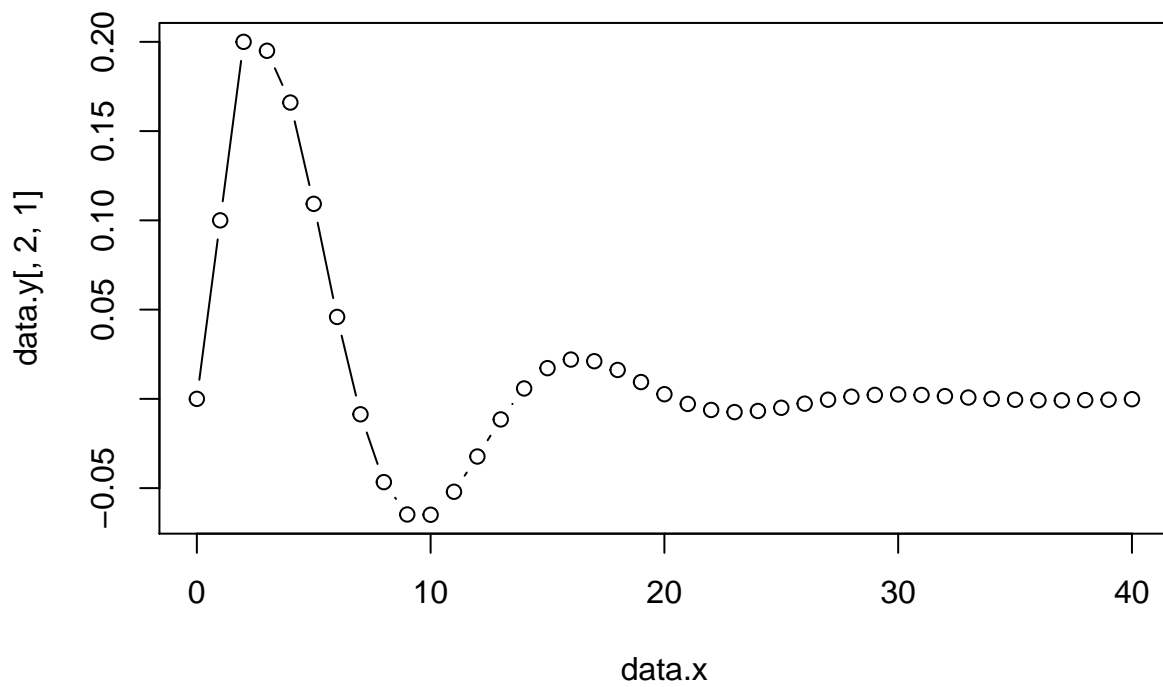
plot(x=data.x, y=data.y[,1,1], type = "b")
```



```
plot(x=data.x, y=data.y[,1,2], type = "b")
```



```
plot(x=data.x, y=data.y[,2,1], type = "b")
```



```
plot(x=data.x, y=data.y[,2,2], type = "b")
```

