Lecture3 Tutorial Exercises

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```
library(matlib)
```

Exercise 2.4.2

c

```
A = matrix(c(1, 0, -1, 3, 2, 0, -1, -1, 0), nrow = 3, byrow = TRUE)
I3 = diag(3)
gaussianElimination(A, I3)
```

```
##      [,1] [,2] [,3] [,4] [,5] [,6]
## [1,]    1    0    0    0    1    2
## [2,]    0    1    0    0   -1   -3
## [3,]    0    0    1   -1    1    2
```

d

```
A = matrix(c(1, -1, 2, -5, 7, -11, -2, 3, -5), nrow = 3, byrow = TRUE)
I3 = diag(3)
gaussianElimination(A, I3)
```

```
##      [,1] [,2] [,3] [,4] [,5] [,6]
## [1,]    1    0    0    2   -1    3
## [2,]    0    1    0    3    1   -1
## [3,]    0    0    1    1    1   -2
```

Exercise 3.1.1

f

```
A = matrix(c(2, 0, -3, 1, 2, 5, 0, 3, 0), nrow = 3, byrow = TRUE)
det(A)
```

```
## [1] -39
```

g

```r
A = matrix(c(1, 2, 3, 4, 5, 6, 7, 8, 9), nrow = 3, byrow = TRUE)
det(A)
```

```
## [1] 6.661338e-16
```

```r
b = c(0, 0, 0)
gaussianElimination(A, b)
```

```
##      [,1] [,2] [,3] [,4]
## [1,]    1    0   -1    0
## [2,]    0    1    2    0
## [3,]    0    0    0    0
```

k

```r
A = matrix(c(0, 1, -1, 0, 3, 0, 0, 2, 0, 1, 2, 1, 5, 0, 0, 7), nrow = 4, byrow = TRUE)
det(A)
```

```
## [1] -33
```

k

```r
A = matrix(c(1, 0, 3, 1, 2, 2, 6, 0, -1, 0 ,-3, 1, 4, 1, 12, 0), nrow = 4, byrow = TRUE)
det(A)
```

```
## [1] 0
```

```r
b = c(0, 0, 0, 0)
gaussianElimination(A, b)
```

```
##      [,1] [,2] [,3] [,4] [,5]
## [1,]    1    0    3    0    0
## [2,]    0    1    0    0    0
## [3,]    0    0    0    1    0
## [4,]    0    0    0    0    0
```