Aufgabe01 - Fibonacci

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13 M?rz 2019

Runtimes

12 measurements of the running times of both algorithms. Starting with five, in steps of three up to 40. Summary for both algorithms.

```
effiz <- c(4.074000116816023e-06, 2.814000254147686e-06, 2.83800000033807e-06,
           3.2310003916791175e-06, 3.702000412886264e-06, 4.574000286083901e-06,
           4.707999778474914e-06, 5.094999778521014e-06, 5.843000053573633e-06,
           6.420000318030361e-06, 6.842000402684789e-06, 7.6110000009066425e-06)

ineffiz <- c(3.5749999369727448e-06, 9.649000276112929e-06, 2.789900008792756e-05,
           0.00012931099990964867, 0.0005072600006315042, 0.0020631119996323832,
           0.009552986000016972, 0.03722496200043679, 0.14449450400024944,
           0.6411986390003221, 2.6210973019997255, 11.000656961000459)
```

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
## 2.814e-06 3.584e-06 4.641e-06 4.813e-06 5.987e-06 7.611e-06
```

```
##      Min.   1st Qu.    Median      Mean   3rd Qu.      Max.
##  0.000004  0.000104  0.005808  1.204747  0.268671 11.000657
```

Data preparation for the plot

```
runtime <- c(4.074000116816023e-06, 2.814000254147686e-06, 2.83800000033807e-06,
             3.2310003916791175e-06, 3.702000412886264e-06, 4.574000286083901e-06,
             4.707999778474914e-06, 5.094999778521014e-06, 5.843000053573633e-06,
             6.420000318030361e-06, 6.842000402684789e-06, 7.6110000009066425e-06,
             3.5749999369727448e-06, 9.649000276112929e-06, 2.789900008792756e-05,
             0.00012931099990964867, 0.0005072600006315042, 0.0020631119996323832,
             0.009552986000016972, 0.03722496200043679, 0.14449450400024944,
             0.6411986390003221, 2.6210973019997255, 11.000656961000459)

group <- c(rep("efficient", 12),rep("inefficient",12))

n <- seq(from=5, to = 40, by = 3)

df <- cbind.data.frame(runtime, group, n)

head(df)
```

```
##     runtime     group  n
## 1 4.074e-06 efficient  5
## 2 2.814e-06 efficient  8
## 3 2.838e-06 efficient 11
## 4 3.231e-06 efficient 14
## 5 3.702e-06 efficient 17
## 6 4.574e-06 efficient 20
```

Plot

Plot of runtime depending on the input number (n) for both algorithms.

```
library(ggplot2)

p <- ggplot(df, aes(x= n, y=runtime, colour = group)) + geom_line(size = 1.0) + geom_point(size=2) + sc
p + xlab("input number") + ylab("runtime in seconds")
```