runif

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```r
knitr::opts_chunk$set(echo = TRUE)
rm(list=ls())
library('forecast')
```

```
## Warning: package 'forecast' was built under R version 3.5.2
```

```r
library('smooth')
```

```
## Warning: package 'smooth' was built under R version 3.5.2
```

```
## Loading required package: greybox
```

```
## Warning: package 'greybox' was built under R version 3.5.2
```

```
## Package "greybox", v0.5.8 loaded.
```

```
## This is package "smooth", v2.5.5
```

```r
library('beanplot')
library('pastecs')
library('scales')
library('ggplot2')

load('runif.Rdata')


iter<-20000
```

ppl vs length

```r
x_axis<-c(40,120,480,1200,4800)
y_40<-c(mean(sapply(re_40[[1]], "[[", 1)),mean(sapply(re_40[[2]], "[[", 1)),
        mean(sapply(re_40[[3]], "[[", 1)))
y_120<-c(mean(sapply(re_120[[1]], "[[", 1)),mean(sapply(re_120[[2]], "[[", 1)),
        mean(sapply(re_120[[3]], "[[", 1)))
y_480<-c(mean(sapply(re_480[[1]], "[[", 1)),mean(sapply(re_480[[2]], "[[", 1)),
        mean(sapply(re_480[[3]], "[[", 1)))
y_1200<-c(mean(sapply(re_1200[[1]], "[[", 1)),mean(sapply(re_1200[[2]], "[[", 1)),
        mean(sapply(re_1200[[3]], "[[", 1)))
y_4800<-c(mean(sapply(re_4800[[1]], "[[", 1)),mean(sapply(re_4800[[2]], "[[", 1)),
        mean(sapply(re_4800[[3]], "[[", 1)))
y_axis<-c(y_40,y_120,y_480,y_1200,y_4800)
mac<-matrix(y_axis,nrow = 3,ncol = 5)
mac<-t(mac)
rownames(mac)<-c('40','120','480','1200','4800')
```

```r
colnames(mac)<-c("DGP", "DJ","CF")
mac
```

```
##             DGP         DJ         CF
## 40    0.05102637 0.05661714 0.05485431
## 120   0.04991514 0.05296796 0.05189598
## 480   0.05029262 0.05127159 0.05120685
## 1200  0.05145874 0.05193280 0.05246670
## 4800  0.04661886 0.04646306 0.04747420
```

```r
v_40<-c(sd(sapply(re_40[[1]], "[[", 1)),sd(sapply(re_40[[2]], "[[", 1)),
        sd(sapply(re_40[[3]], "[[", 1)))
v_120<-c(sd(sapply(re_120[[1]], "[[", 1)),sd(sapply(re_120[[2]], "[[", 1)),
        sd(sapply(re_120[[3]], "[[", 1)))
v_480<-c(sd(sapply(re_480[[1]], "[[", 1)),sd(sapply(re_480[[2]], "[[", 1)),
        sd(sapply(re_480[[3]], "[[", 1)))
v_1200<-c(sd(sapply(re_1200[[1]], "[[", 1)),sd(sapply(re_1200[[2]], "[[", 1)),
        sd(sapply(re_1200[[3]], "[[", 1)))
v_4800<-c(sd(sapply(re_4800[[1]], "[[", 1)),sd(sapply(re_4800[[2]], "[[", 1)),
        sd(sapply(re_4800[[3]], "[[", 1)))
v_axis<-c(v_40,v_120,v_480,v_1200,v_4800)
var<-matrix(v_axis,nrow = 3,ncol = 5)
var<-t(var)
rownames(var)<-c('40','120','480','1200','4800')
colnames(var)<-c("DGP", "DJ","CF")
var
```

```
##             DGP         DJ         CF
## 40    0.1125779 0.10219512 0.11423122
## 120   0.1022064 0.09444466 0.10316507
## 480   0.0956825 0.08841309 0.09671441
## 1200  0.1068847 0.10011423 0.10734143
## 4800  0.4572988 0.44136219 0.46472951
```

```r
par(mar=c(par('mar')[1:3], 0))
plot.new()
l <- legend(0, 0, bty='n',c("DGP", "DJ","PM"),plot=FALSE, pch=1:3,col=1:3)
w <- grconvertX(l$rect$w, to='ndc') - grconvertX(0, to='ndc')
par(omd=c(0, 1-w, 0, 1))
matplot(mac, type = c("b"),pch=c(1,2,4),col = c(1,2,4),xaxt = "n",yaxt = "n"
        ,xlab = 'data length',ylab = 'percetage profit loss')
axis(1, at=1:5, labels=x_axis)
axis(2, at=pretty(y_axis), lab=paste0(pretty(y_axis) * 100, "%"), las=TRUE)
legend(par('usr')[2], par('usr')[4], bty='n', xpd=NA
        ,c("DGP", "DJ","PM"), pch=c(1,2,4),col=c(1,2,4))
```
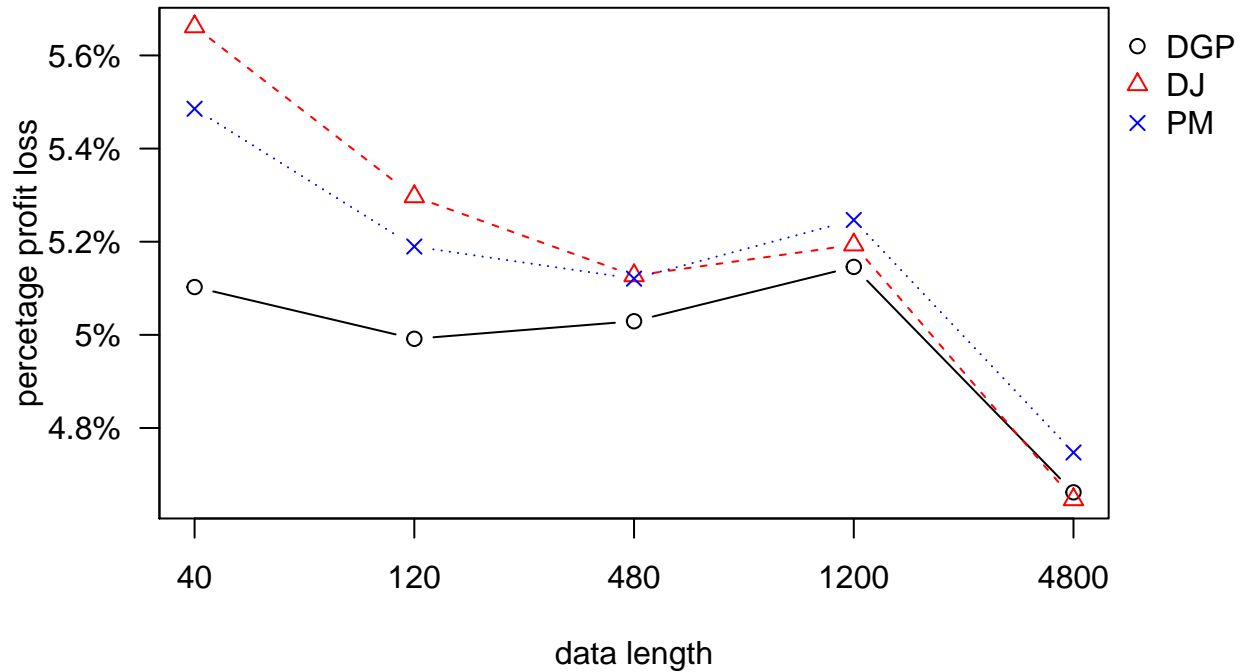
sl vs length

```r
x_axis<-c(40,120,480,1200,4800)
y_40<-c(mean(sapply(re_40[[1]], "[[", 2)),mean(sapply(re_40[[2]], "[[", 2)),
        mean(sapply(re_40[[3]], "[[", 2)))
y_120<-c(mean(sapply(re_120[[1]], "[[", 2)),mean(sapply(re_120[[2]], "[[", 2)),
        mean(sapply(re_120[[3]], "[[", 2)))
y_480<-c(mean(sapply(re_480[[1]], "[[", 2)),mean(sapply(re_480[[2]], "[[", 2)),
        mean(sapply(re_480[[3]], "[[", 2)))
y_1200<-c(mean(sapply(re_1200[[1]], "[[", 2)),mean(sapply(re_1200[[2]], "[[", 2)),
        mean(sapply(re_1200[[3]], "[[", 2)))
y_4800<-c(mean(sapply(re_4800[[1]], "[[", 2)),mean(sapply(re_4800[[2]], "[[", 2)),
        mean(sapply(re_4800[[3]], "[[", 2)))
y_axis<-c(y_40,y_120,y_480,y_1200,y_4800)
mac<-matrix(y_axis,nrow = 3,ncol = 5)
mac<-t(mac)
rownames(mac)<-c('40','120','480','1200','4800')
colnames(mac)<-c("DGP", "DJ","CF")
mac
```

```
##          DGP      DJ      CF
## 40    0.30575 0.21780 0.32370
## 120   0.30045 0.22955 0.31030
## 480   0.29855 0.24035 0.30370
## 1200  0.29815 0.23840 0.30125
## 4800  0.29740 0.23480 0.30035
```

```r
v_40<-c(sd(sapply(re_40[[1]], "[[", 2)),sd(sapply(re_40[[2]], "[[", 2)),
        sd(sapply(re_40[[3]], "[[", 2)))
v_120<-c(sd(sapply(re_120[[1]], "[[", 2)),sd(sapply(re_120[[2]], "[[", 2)),
        sd(sapply(re_120[[3]], "[[", 2)))
v_480<-c(sd(sapply(re_480[[1]], "[[", 2)),sd(sapply(re_480[[2]], "[[", 2)),
```

```
        sd(sapply(re_480[[3]], "[[", 2)))
v_1200<-c(sd(sapply(re_1200[[1]], "[[", 2)),sd(sapply(re_1200[[2]], "[[", 2)),
        sd(sapply(re_1200[[3]], "[[", 2)))
v_4800<-c(sd(sapply(re_4800[[1]], "[[", 2)),sd(sapply(re_4800[[2]], "[[", 2)),
        sd(sapply(re_4800[[3]], "[[", 2)))
v_axis<-c(v_40,v_120,v_480,v_1200,v_4800)
var<-matrix(v_axis,nrow = 3,ncol = 5)
var<-t(var)
rownames(var)<-c('40','120','480','1200','4800')
colnames(var)<-c("DGP", "DJ","CF")
var
```

```
##            DGP        DJ        CF
## 40   0.4607359 0.4127610 0.4678988
## 120  0.4584652 0.4205540 0.4626279
## 480  0.4576334 0.4273067 0.4598662
## 1200 0.4574571 0.4261156 0.4588126
## 4800 0.4571255 0.4238844 0.4584216
```

```
par(mar=c(par('mar')[1:3], 0))
plot.new()
l <- legend(0, 0, bty='n',c("DGP", "DJ","PM"),plot=FALSE, pch=1:3,col=1:3)
w <- grconvertX(l$rect$w, to='ndc') - grconvertX(0, to='ndc')
par(omd=c(0, 1-w, 0, 1))
matplot(mac, type = c("b"),pch=c(1,2,4),col = c(1,2,4),xaxt = "n"
        ,xlab = 'data length',ylab = 'service level')
abline(h=0.3,lty=2,col='black')
axis(1, at=1:5, labels=x_axis)
legend(par('usr')[2], par('usr')[4], bty='n', xpd=NA
        ,c("DGP", "DJ","PM"), pch=c(1,2,4),col=c(1,2,4))
```