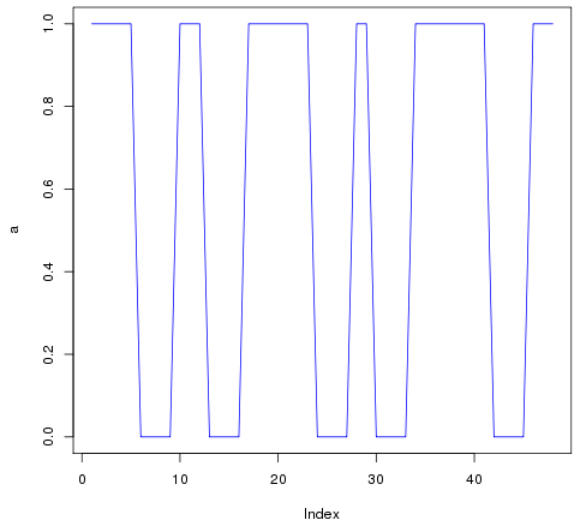
```
library(zoo)
```

```
##
## Attaching package: 'zoo'
```

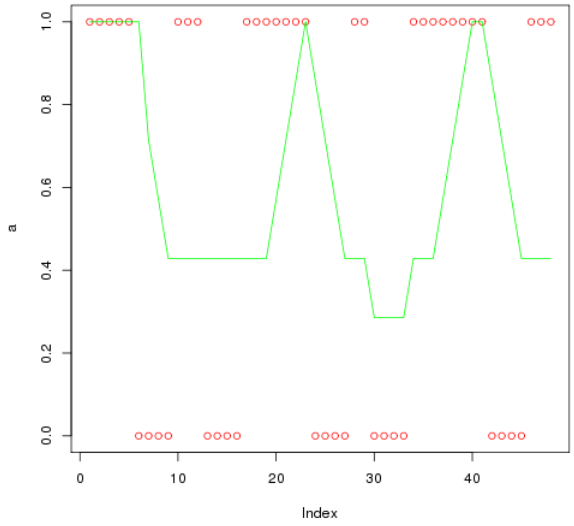
```
## The following objects are masked from 'package:base':
##
##     as.Date, as.Date.numeric
```

```
# same length pattern == 4
a <- c(1,1,1,1,1,0,0,0,0,1,1,1,0,0,0,0,1,1,1,1,1,1,1,0,0,0,0,1,1,1,1,1,1,1,0,0,0,0,1,1,1,1,1,1,1,0,0,0,0,1,1,1)

plot(a, type="l", col="blue")
```



```
# window = 7
n = 7
# calculate mean of the first 7 element
b <- sapply(seq(1:(n-1)), function(x) mean(a[rep(1,len=x)]))
# mean of the window of 8
d <- rollapply(a, n, mean)
# plot
plot(a, col="red")
lines(c(b,d), col="green")
```




```
# window = 4
n = 4
# calculate mean of the first 7 element
b <- sapply(seq(1:(n-1)), function(x) mean(a[rep(1,len=x)]))
# mean of the window of 8
d <- rollapply(a, n, mean)
# plot
plot(a, col="red")
lines(c(b,d), col="green")
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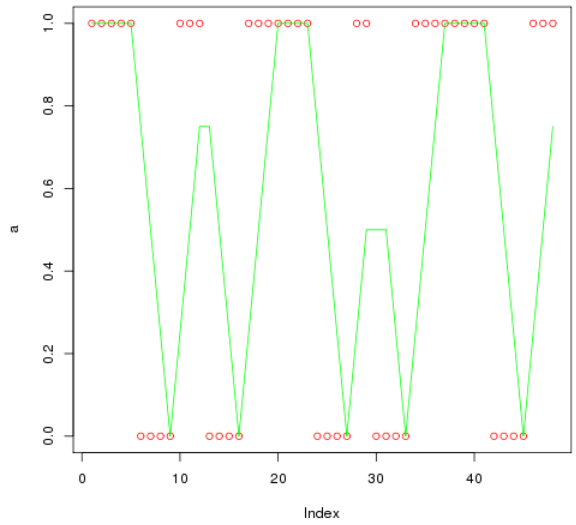
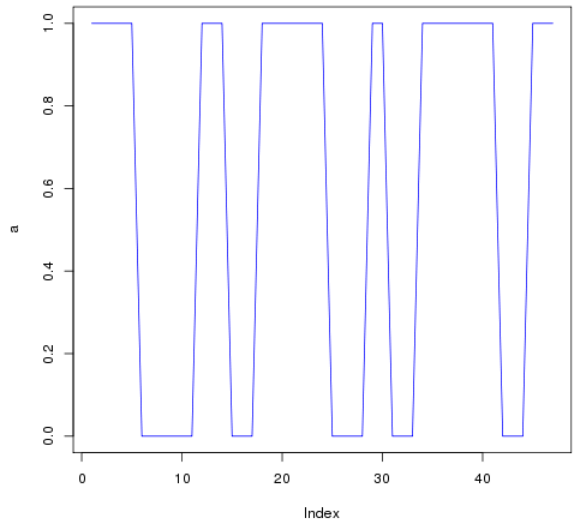



```
# pattern length varies from 3 to 5
a <- c(1,1,1,1,1,0,0,0,0,0,0,1,1,1,0,0,0,1,1,1,1,1,1,1,0,0,0,0,1,1,0,0,0,1,1,1,1,1,1,1,1,0,0,0,1,1,1)

plot(a, type="l", col="blue")
```

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# window = 7
n = 7
# calculate mean of the first 7 element
b <- sapply(seq(1:(n-1)), function(x) mean(a[rep(1,len=x)]))
# mean of the window of 8
d <- rollapply(a, n, mean)
# plot
plot(a, col="red")
lines(c(b,d), col="green")
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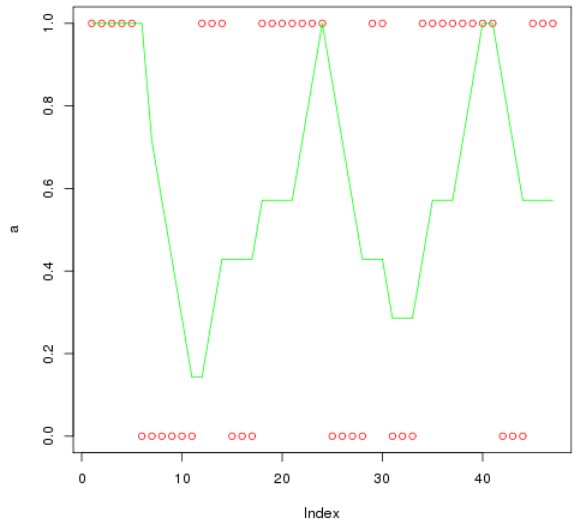


```
# window = 4
n = 4
# calculate mean of the first 7 element
b <- sapply(seq(1:(n-1)), function(x) mean(a[rep(1,len=x)]))
# mean of the window of 8
d <- rollapply(a, n, mean)
# plot
plot(a, col="red")
lines(c(b,d), col="green")
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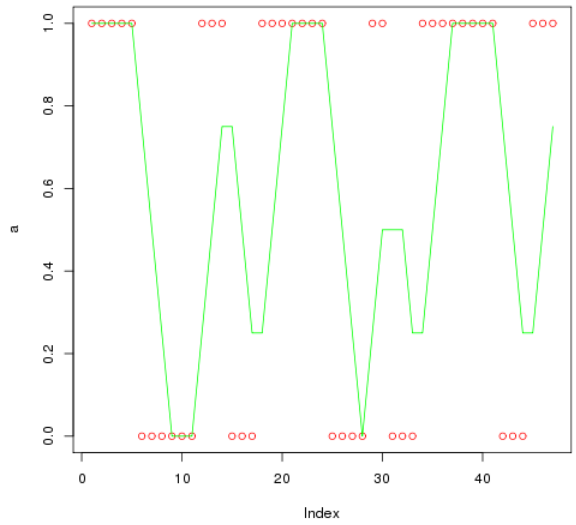
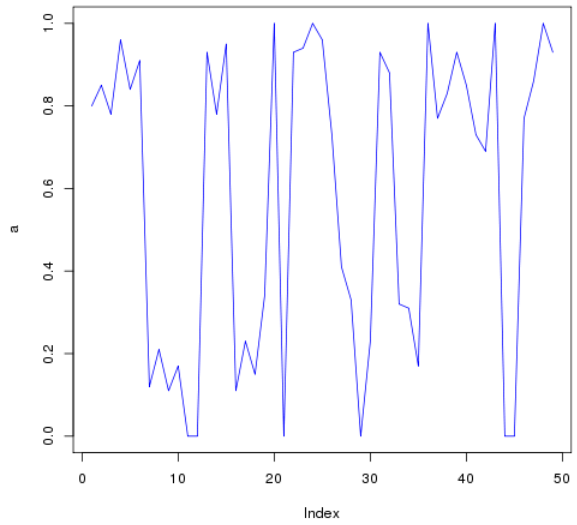



```
# value varying
a <- c(0.8,0.85,0.78,0.96,0.84,0.91,0.12,0.21,0.11,0.17,0,0,0.93,0.78,0.95,0.11,0.23,0.15,0.34,1,0,0.93,0.94,1,0.96,0.73,0.41,0.33,0,0.23,0.93,0.88,0.32,0.31,0.17,1,0.

plot(a, type="l", col="blue")
```




```
# window = 7
n = 7
# calculate mean of the first 7 element
b <- sapply(seq(1:(n-1)), function(x) mean(a[rep(1,len=x)]))
# mean of the window of 8
d <- rollapply(a, n, mean)
# plot
plot(a, col="red")
lines(c(b,d), col="green")
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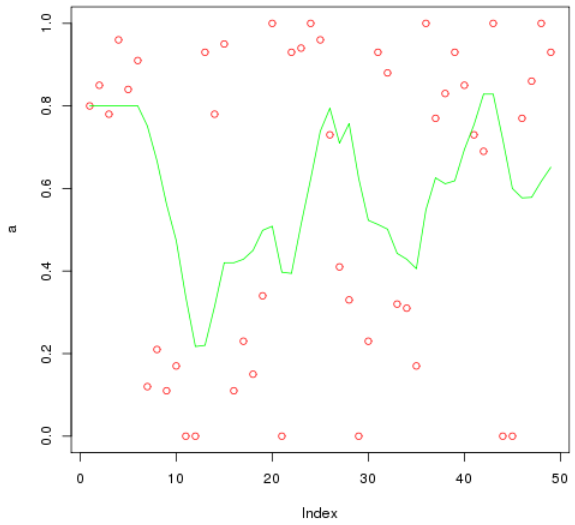
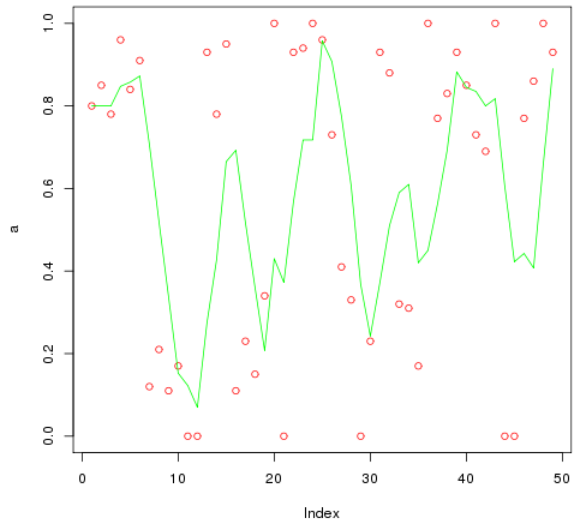
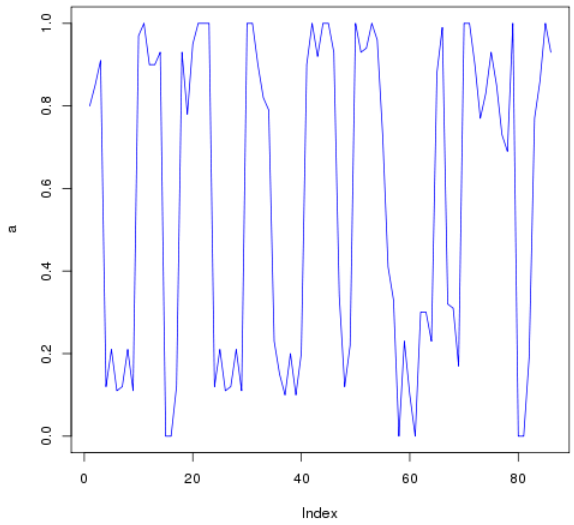



```
# window = 4
n = 4
# calculate mean of the first 7 element
b <- sapply(seq(1:(n-1)), function(x) mean(a[rep(1,len=x)]))
# mean of the window of 8
d <- rollapply(a, n, mean)
# plot
plot(a, col="red")
lines(c(b,d), col="green")
```

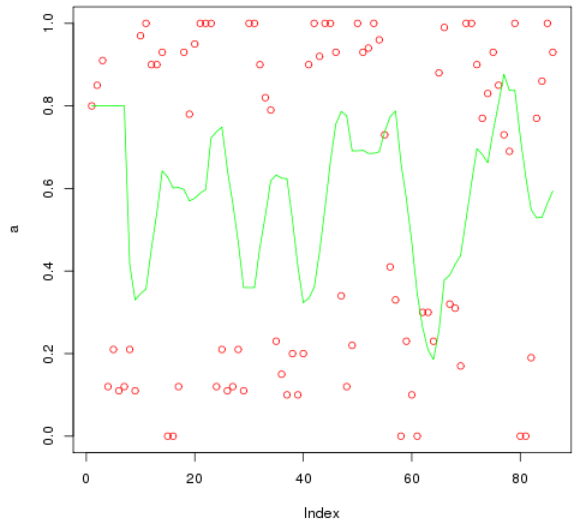



```
# value varying and pattern varying
a <- c(0.8,0.85,0.91,0.12,0.21,0.11,0.12,0.21,0.11,
    0.97,1,0.9,0.9,0.93,0,0,0.12,
    0.93,0.78,0.95,1,1,1,0.12,0.21,0.11,0.12,0.21,0.11,
    1,1,0.9,0.82,0.79,0.23,0.15,0.1,0.2,0.1,0.2,
    0.9,1,0.92,1,1,0.93,0.34,0.12,0.22,
    1,0.93,0.94,1,0.96,0.73,0.41,0.33,0,0.23,0.1,0,
    0.3,0.3,0.23,
    0.88,0.99,0.32,0.31,0.17,
    1,1,0.9,0.77,0.83,0.93,0.85,0.73,0.69,1,0,0,0.19,0.77,0.86,1,0.93)

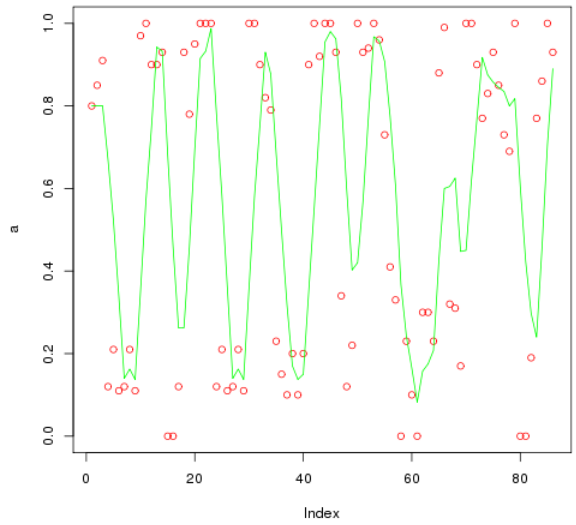
plot(a, type="l", col="blue")
```



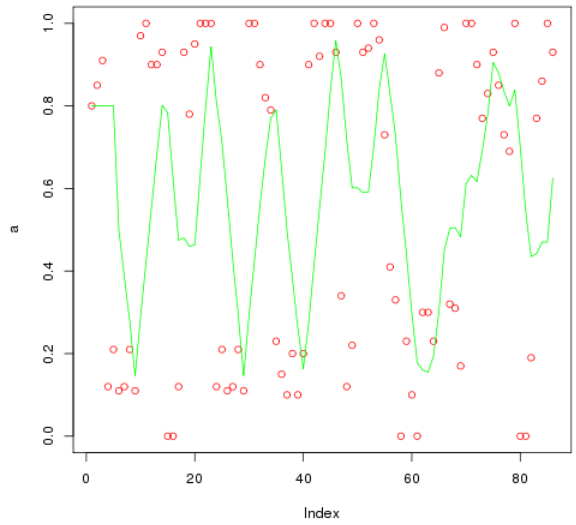

```
# window = 8
n = 8
# calculate mean of the first 7 element
b <- sapply(seq(1:(n-1)), function(x) mean(a[rep(1,len=x)]))
# mean of the window of 8
d <- rollapply(a, n, mean)
# plot
plot(a, col="red")
lines(c(b,d), col="green")
```




```
# window = 4
n = 4
# calculate mean of the first 7 element
b <- sapply(seq(1:(n-1)), function(x) mean(a[rep(1,len=x)]))
# mean of the window of 8
d <- rollapply(a, n, mean)
# plot
plot(a, col="red")
lines(c(b,d), col="green")
```




```
# window = 6
n = 6
# calculate mean of the first 7 element
b <- sapply(seq(1:(n-1)), function(x) mean(a[rep(1,len=x)]))
# mean of the window of 8
d <- rollapply(a, n, mean)
# plot
plot(a, col="red")
lines(c(b,d), col="green")
```


a
0.0
0.2
0.4
0.6
0.8
1.0
0
20
40
60
80
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