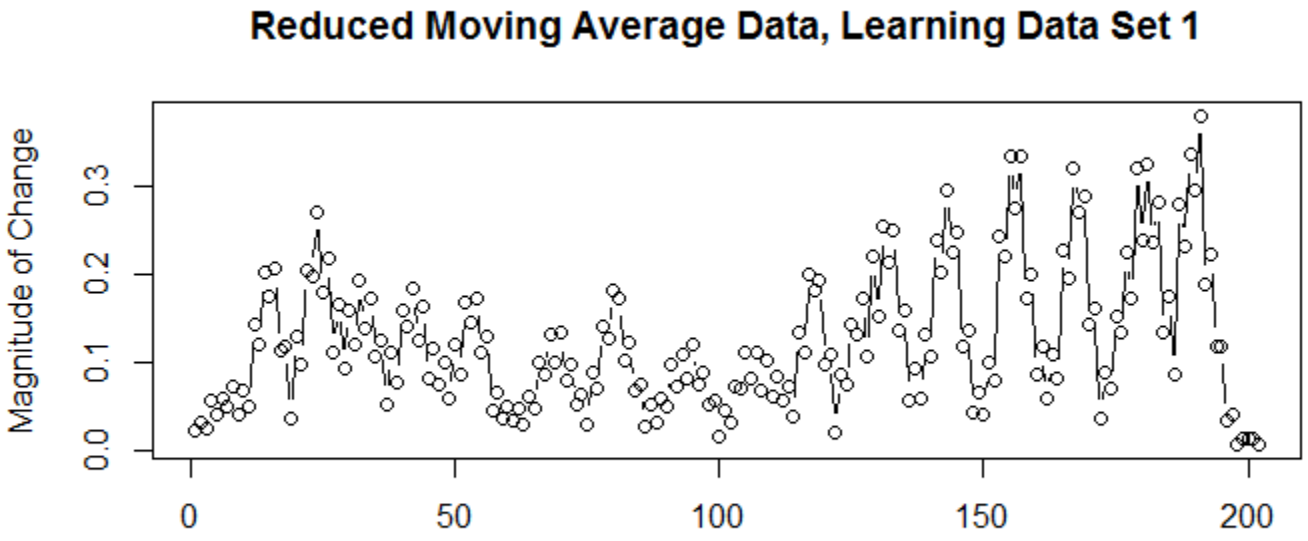
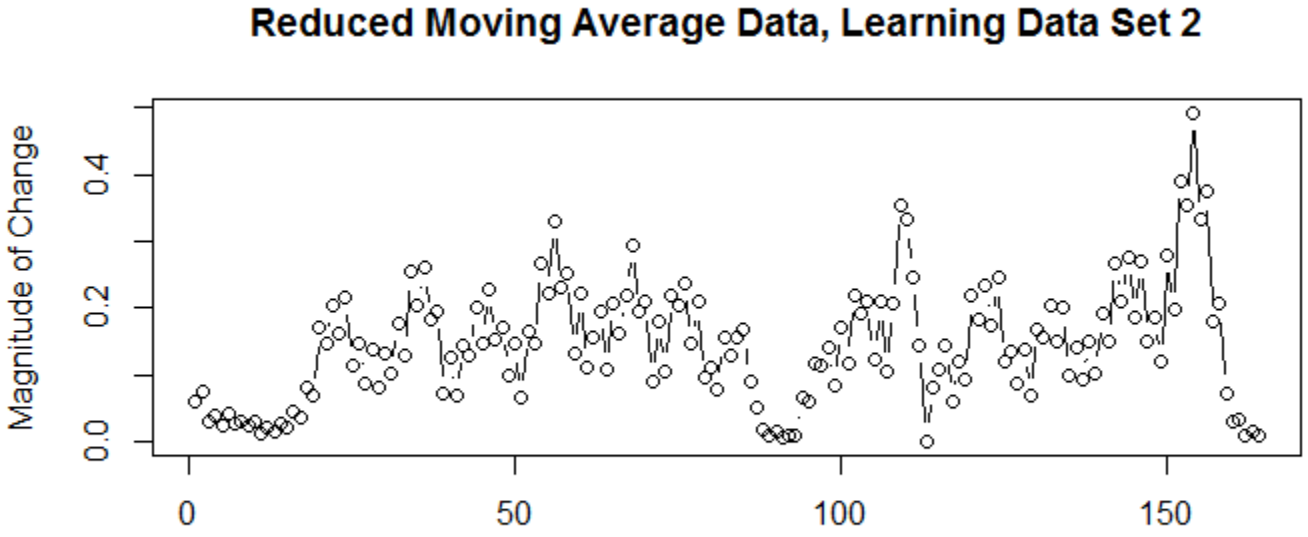
```
> # Access Excel files
> learn1data <- read.table("C:\\Users\\Kate\\Documents\\MU\\MSCS 6050\\data\\Casey\\c
event 2.csv", header=TRUE, sep=",")
> learn2data <- read.table("C:\\Users\\Kate\\Documents\\MU\\MSCS 6050\\data\\Casey\\c
event 3.csv", header=TRUE, sep=",")
> learn3data <- read.table("C:\\Users\\Kate\\Documents\\MU\\MSCS 6050\\data\\Casey\\c
event 4.csv", header=TRUE, sep=",")
> learn4data <- read.table("C:\\Users\\Kate\\Documents\\MU\\MSCS 6050\\data\\Casey\\c
event 5.csv", header=TRUE, sep=",")
> test1data <- read.table("C:\\Users\\Kate\\Documents\\MU\\MSCS 6050\\data\\Casey\\c e
vent 6.csv", header=TRUE, sep=",")
> test2data <- read.table("C:\\Users\\Kate\\Documents\\MU\\MSCS 6050\\data\\Casey\\c e
vent 7.csv", header=TRUE, sep=",")
> test3data <- read.table("C:\\Users\\Kate\\Documents\\MU\\MSCS 6050\\data\\Casey\\c e
vent 8.csv", header=TRUE, sep=",")
> # Select data columns
> a_l1 <- learn1data[,12]; a_l2 <- learn2data[,12]; a_l3 <- learn3data[,12]; a_l4 <- l
earn4data[,12]
> a_t1 <- test1data[,12]; a_t2 <- test2data[,12]; a_t3 <- test3data[,12]
> # Set missing first alpha value to zero
> a_l1[1] <- 0; a_l2[1] <- 0; a_l3[1] <- 0; a_l4[1] <- 0
> a_t1[1] <- 0; a_t2[1] <- 0; a_t3[1] <- 0
> # Assign walking and falling index ranges
> normstart_l1 <- 54; fallstop_l1 <- 461
> normstart_l2 <- 85; fallstop_l2 <- 432
> normstart_l3 <- 90; fallstop_l3 <- 725
> normstart_l4 <- 113; fallstop_l4 <- 771
> normstart_t1 <- 116; fallstop_t1 <- 798
> normstart_t2 <- 114; fallstop_t2 <- 753
> normstart_t3 <- 137; fallstop_t3 <- 1036
> # Useful segments of data set
> learnseg_l1 <- a_l1[normstart_l1:fallstop_l1]; learnseg_l2 <- a_l2[normstart_l2:fall
stop_l2]; learnseg_l3 <- a_l3[normstart_l3:fallstop_l3]; learnseg_l4 <- a_l4[normstart
_l4:fallstop_l4]
> testseg_t1 <- a_t1[normstart_t1:fallstop_t1]; testseg_t2 <- a_t2[normstart_t2:fallst
op_t2]; testseg_t3 <- a_t3[normstart_t3:fallstop_t3]
>
> # Moving average
> install.packages("zoo")
Installing package into 'C:/Users/Kate/Documents/R/win-library/3.2'
(as 'lib' is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/3.2/zoo_1.7-12.zip'
Content type 'application/zip' length 897042 bytes (876 KB)
downloaded 876 KB

package 'zoo' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
        C:\Users\Kate\AppData\Local\Temp\RtmpuocXu1\downloaded_packages
> library(zoo)

Attaching package: 'zoo'

The following objects are masked from 'package:base':

    as.Date, as.Date.numeric

> # Learning moving average
> learn1mvavg <- rollapply(data = learnseg_l1, width = 10, FUN = 'mean')
> learn2mvavg <- rollapply(data = learnseg_l2, width = 10, FUN = 'mean')
> learn3mvavg <- rollapply(data = learnseg_l3, width = 10, FUN = 'mean')
> learn4mvavg <- rollapply(data = learnseg_l4, width = 10, FUN = 'mean')
> lenavg_l1 <- length(learn1mvavg); lenavg_l2 <- length(learn2mvavg); lenavg_l3 <- len
gth(learn3mvavg); lenavg_l4 <- length(learn4mvavg)
> # Value frequencies in subsets
> red1data <- 0; red2data <- 0; red3data <- 0; red4data <- 0
> red1data[1] <- learn1mvavg[1]; j <- 1; k <- 2; for (i in 2: lenavg_l1) if(abs(learn1
mvavg[i] - learn1mvavg[i-1]) > 0) { red1data[j] <- learn1mvavg[i]; j = j + 1 }
> red2data[1] <- learn2mvavg[1]; j <- 1; k <- 2; for (i in 2: lenavg_l2) if(abs(learn2
mvavg[i] - learn2mvavg[i-1]) > 0) { red2data[j] <- learn2mvavg[i]; j = j + 1 }
```

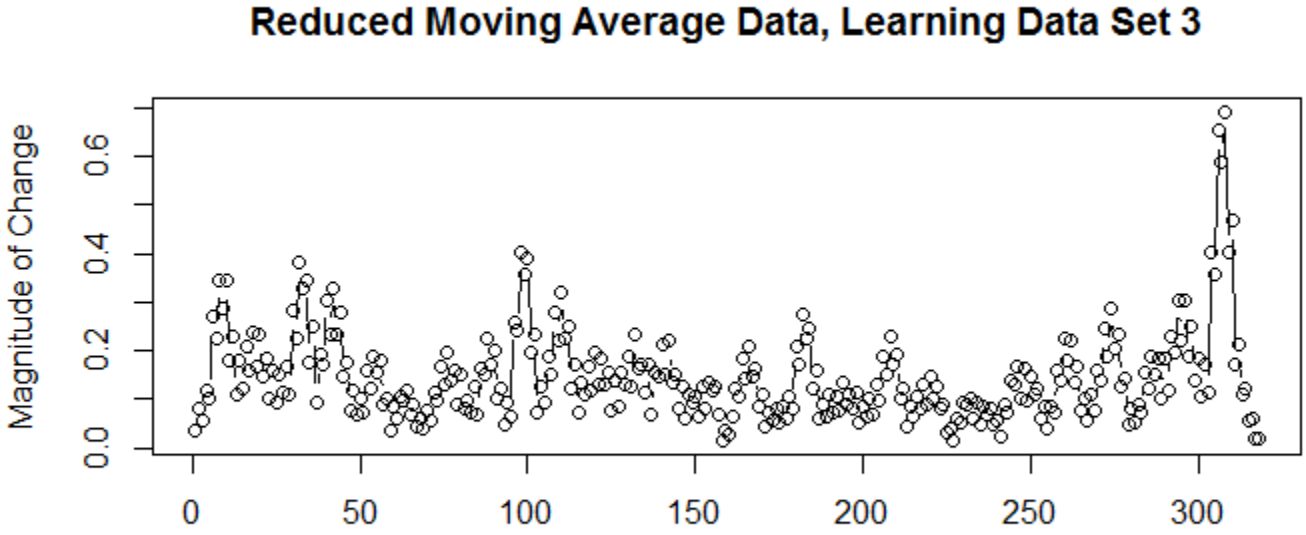
```
> red3data[1] <- learn3mvavg[1]; j <- 1; k <- 2; for (i in 2: lenavg_l3) if(abs(learn3
mvavg[i] - learn3mvavg[i-1]) > 0) { red3data[j] <- learn3mvavg[i]; j = j + 1 }
> red4data[1] <- learn4mvavg[1]; j <- 1; k <- 2; for (i in 2: lenavg_l4) if(abs(learn4
mvavg[i] - learn4mvavg[i-1]) > 0) { red4data[j] <- learn4mvavg[i]; j = j + 1 }
> # Plot concatenated subsets cleaned of duplicated entries
> lenredu_l1 <- length(red1data); lenredu_l2 <- length(red2data); lenredu_l3 <- length
(red3data); lenredu_l4 <- length(red4data)
> plotx_l1 <- cbind(1:lenredu_l1); plot(plotx_l1, red1data, 'b', main = "Reduced Movin
g Average Data, Learning Data Set 1", xlab = "", ylab = "Magnitude of Change")
```



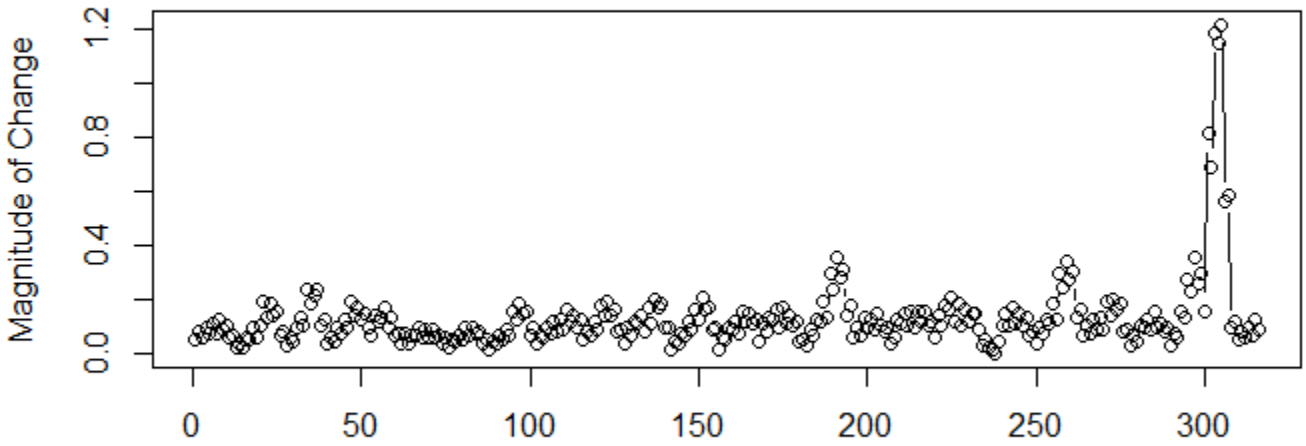

```
> plotx_l2 <- cbind(1:lenredu_l2); plot(plotx_l2, red2data, 'b', main = "Reduced Movin
g Average Data, Learning Data Set 2", xlab = "", ylab = "Magnitude of Change")
```




```
> plotx_l3 <- cbind(1:lenredu_l3); plot(plotx_l3, red3data, 'b', main = "Reduced Movin
g Average Data, Learning Data Set 3", xlab = "", ylab = "Magnitude of Change")
```




```
> plotx_l4 <- cbind(1:lenredu_l4); plot(plotx_l4, red4data, 'b', main = "Reduced Movin
g Average Data, Learning Data Set 4", xlab = "", ylab = "Magnitude of Change")
```

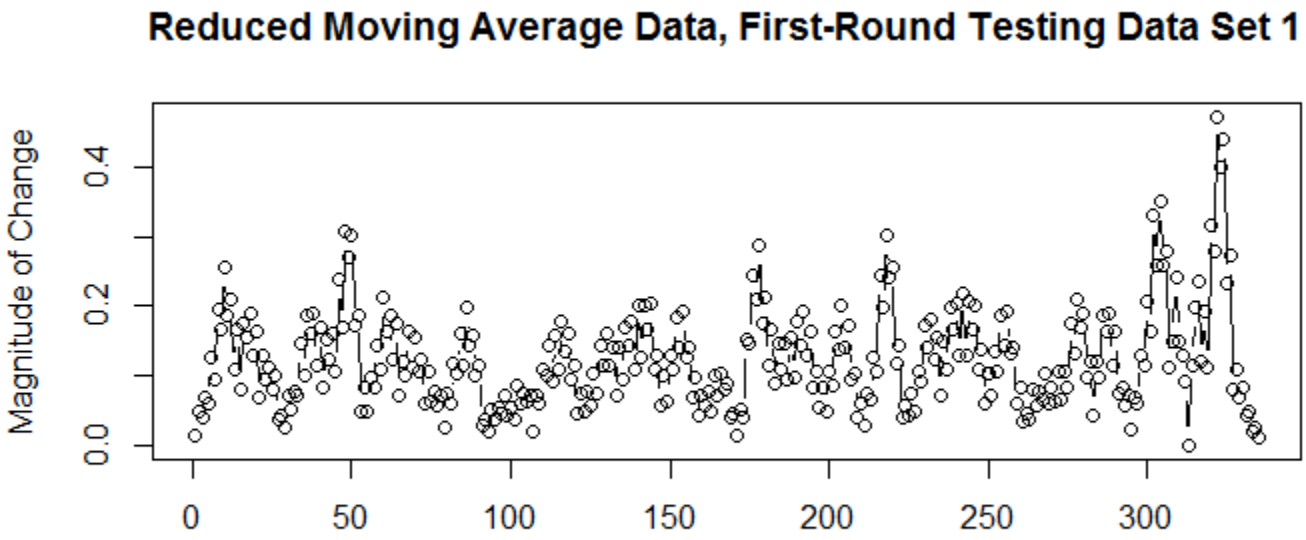



```
> # Methodology for Testing
> max_l1 <- red1data[15]; maxtest_l1 <- 0; maxdiff_l1 <- red1data[15] - red1data[21];
maxdifftest_l1 <- 0; fall_l1 <- 0; for (i in 1:lenredu_l1) fall_l1[i] <- 0
> for (i in 2:(lenredu_l1 - 5)) { if(red1data[i] > max_l1) {
+   maxtest_l1 <- red1data[i];
+   maxdifftest_l1 <- red1data[i] - red1data[i + 6]
+   if(maxdifftest_l1 > maxdiff_l1) {
+     fall_l1[i] <- 1;
+     max_l1 <- maxtest_l1;
+     maxdiff_l1 <- maxdifftest_l1
+   }
+ }
+ }
> fall_l1
  [1] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
```

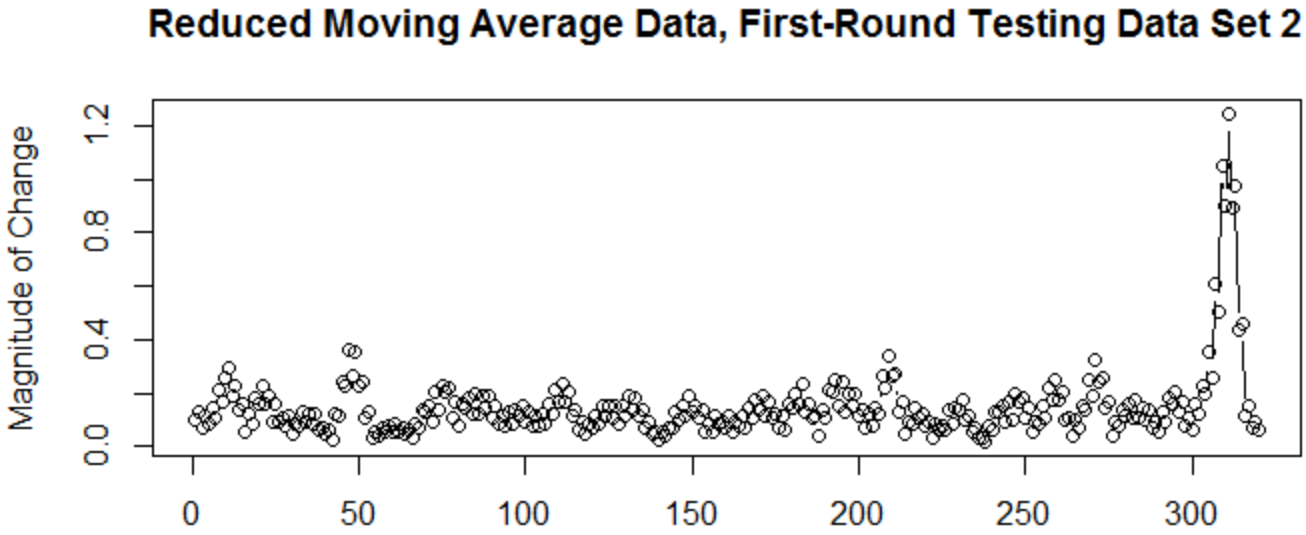
```
 [42] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
 [83] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[124] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[165] 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
> max_l2 <- red2data[15]; maxtest_l2 <- 0; maxdiff_l2 <- red2data[15] - red2data[21];
maxdifftest_l2 <- 0; fall_l2 <- 0; for (i in 1:lenredu_l2) fall_l2[i] <- 0
> for (i in 2:(lenredu_l2 - 5)) {
+   if(red2data[i] > max_l2) {
+     maxtest_l2 <- red2data[i];
+     maxdifftest_l2 <- red2data[i] - red2data[i + 6]
+     if(maxdifftest_l2 > maxdiff_l2) {
+       fall_l2[i] <- 1;
+       max_l2 <- maxtest_l2;
+       maxdiff_l2 <- maxdifftest_l2
+     }
+   }
+ }
> fall_l2
  [1] 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 1 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
0
 [42] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
 [83] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[124] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0
0
> max_l3 <- red3data[15]; maxtest_l3 <- 0; maxdiff_l3 <- red3data[15] - red3data[21];
maxdifftest_l3 <- 0; fall_l3 <- 0; for (i in 1:lenredu_l3) fall_l3[i] <- 0
> for (i in 2:(lenredu_l3 - 5)) {
+   if(red3data[i] > max_l3) {
+     maxtest_l3 <- red3data[i];
+     maxdifftest_l3 <- red3data[i] - red3data[i + 6]
+     if(maxdifftest_l3 > maxdiff_l3) {
+       fall_l3[i] <- 1;
+       max_l3 <- maxtest_l3;
+       maxdiff_l3 <- maxdifftest_l3
+     }
+   }
+ }
> fall_l3
  [1] 0 0 0 0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0
0
 [42] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
 [83] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[124] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[165] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[206] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[247] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[288] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 1 0 0 0 0 0 0 0 0 0
> max_l4 <- red4data[15]; maxtest_l4 <- 0; maxdiff_l4 <- red4data[15] - red4data[21];
maxdifftest_l4 <- 0; fall_l4 <- 0; for (i in 1:lenredu_l4) fall_l4[i] <- 0
> for (i in 2:(lenredu_l4 - 5)) {
+   if(red4data[i] > max_l4) {
+     maxtest_l4 <- red4data[i];
+     maxdifftest_l4 <- red4data[i] - red4data[i + 6]
+     if(maxdifftest_l4 > maxdiff_l4) {
+       fall_l4[i] <- 1;
+       max_l4 <- maxtest_l4;
+       maxdiff_l4 <- maxdifftest_l4
+     }
+   }
+ }
```

```
> fall_l4
  [1] 0 1 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
0
 [42] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
 [83] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[124] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[165] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
0
[206] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[247] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[288] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 1 0 0 0 0 0 0 0 0 0 0
>
> # Testing
> # Local Maximum Followed by Large Difference at Index Maximum + 6
> # # Moving Average
> test1mvavg <- rollapply(data = testseg_t1, width = 10, FUN = 'mean')
> test2mvavg <- rollapply(data = testseg_t2, width = 10, FUN = 'mean')
> test3mvavg <- rollapply(data = testseg_t3, width = 10, FUN = 'mean')
> lenavg_t1 <- length(test1mvavg); lenavg_t2 <- length(test2mvavg); lenavg_t3 <- lengt
h(test3mvavg)
> # # Remove Duplicates
> red1test <- 0; red2test <- 0; red3test <- 0
> red1test[1] <- test1mvavg[1]; j <- 1; k <- 2; for (i in 2: lenavg_t1) if(abs(test1mv
avg[i] - test1mvavg[i-1]) > 0) { red1test[j] <- test1mvavg[i]; j = j + 1 }
> red2test[1] <- test2mvavg[1]; j <- 1; k <- 2; for (i in 2: lenavg_t2) if(abs(test2mv
avg[i] - test2mvavg[i-1]) > 0) { red2test[j] <- test2mvavg[i]; j = j + 1 }
> red3test[1] <- test3mvavg[1]; j <- 1; k <- 2; for (i in 2: lenavg_t3) if(abs(test3mv
avg[i] - test3mvavg[i-1]) > 0) { red3test[j] <- test3mvavg[i]; j = j + 1 }
> lenredu_t1 <- length(red1test); lenredu_t2 <- length(red2test); lenredu_t3 <- length
(red3test)
> # # Testing Methodology
> max_t1 <- red1test[15]; maxtest_t1 <- 0; maxdiff_t1 <- red1test[15] - red1test[21];
maxdifftest_t1 <- 0; fall_t1<- 0; for (i in 1:lenredu_t1) fall_t1[i] <- 0
> for (i in 2:(lenredu_t1 - 10)) {
+   if(red1test[i] > max_t1) {
+     maxtest_t1 <- red1test[i];
+     maxdifftest_t1 <- red1test[i] - red1test[i + 6]
+     if(maxdifftest_t1 > maxdiff_t1) {
+       fall_t1[i] <- 1;
+       max_t1 <- maxtest_t1;
+       maxdiff_t1 <- maxdifftest_t1
+     }
+   }
+ }
> fall_t1
  [1] 0 0 0 0 0 0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
 [42] 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
 [83] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[124] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[165] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[206] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[247] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[288] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0
0
[329] 0 0 0 0 0 0 0
> max_t2 <- red2test[15]; maxtest_t2 <- 0; maxdiff_t2 <- red2test[15] - red2test[21];
maxdifftest_t2 <- 0; fall_t2 <- 0; for (i in 1:lenredu_t2) fall_t2[i] <- 0
> for (i in 2:(lenredu_t2 - 10)) {
+   if(red2test[i] > max_t2) {
```

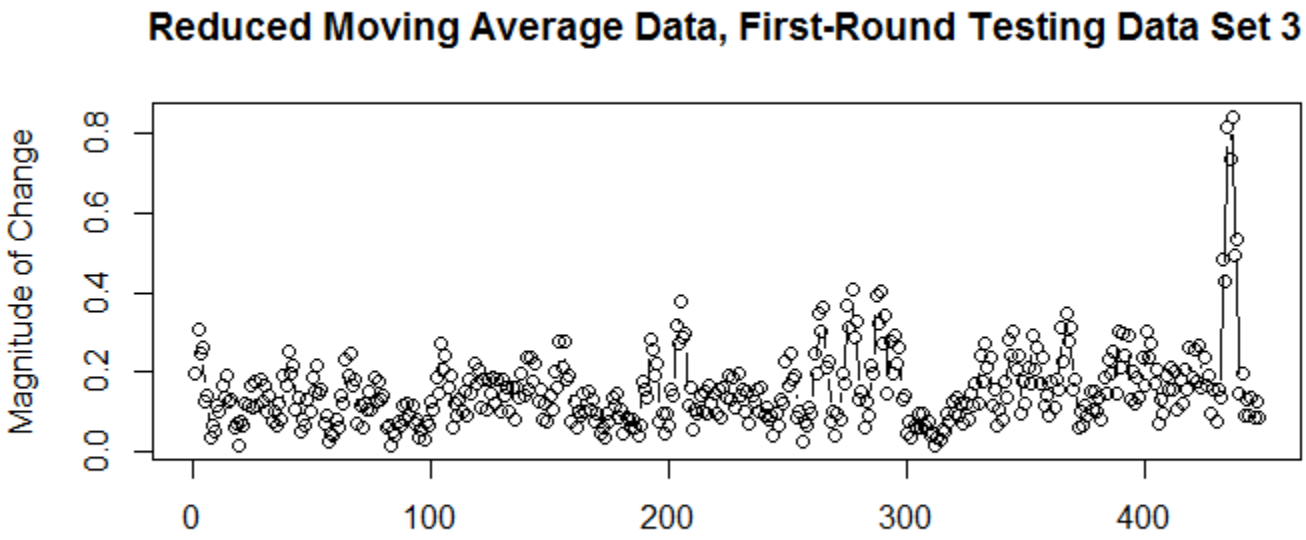
```
+     maxtest_t2 <- red2test[i];
+     maxdifftest_t2 <- red2test[i] - red2test[i + 6]
+     if(maxdifftest_t2 > maxdiff_t2) {
+       fall_t2[i] <- 1;
+       max_t2 <- maxtest_t2;
+       maxdiff_t2 <- maxdifftest_t2
+     }
+   }
+ }
> fall_t2
  [1] 0 0 0 0 0 0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
 [42] 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
 [83] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[124] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[165] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[206] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[247] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[288] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
> max_t3 <- red3test[15]; maxtest_t3 <- 0; maxdiff_t3 <- red3test[15] - red3test[21];
maxdifftest_t3 <- 0; fall_t3 <- 0; for (i in 1:lenredu_t3) fall_t3[i] <- 0
> for (i in 2:(lenredu_t3 - 10)) {
+   if(red3test[i] > max_t3) {
+     maxtest_t3 <- red3test[i];
+     maxdifftest_t3 <- red3test[i] - red3test[i + 6]
+     if(maxdifftest_t3 > maxdiff_t3) {
+       fall_t3[i] <- 1;
+       max_t3 <- maxtest_t3;
+       maxdiff_t3 <- maxdifftest_t3
+     }
+   }
+ }
> fall_t3
  [1] 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
 [42] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
 [83] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[124] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[165] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
1
[206] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[247] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0
0
[288] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[329] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[370] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[411] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0
> # # Plots
> plotx_t1 <- cbind(1:lenredu_t1); plot(plotx_t1, red1test, 'b', main = "Reduced Movin
g Average Data, First-Round Testing Data Set 1", xlab = "", ylab = "Magnitude of Chang
e")
```




```
> plotx_t2 <- cbind(1:lenredu_t2); plot(plotx_t2, red2test, 'b', main = "Reduced Movin
g Average Data, First-Round Testing Data Set 2", xlab = "", ylab = "Magnitude of Chang
e")
```

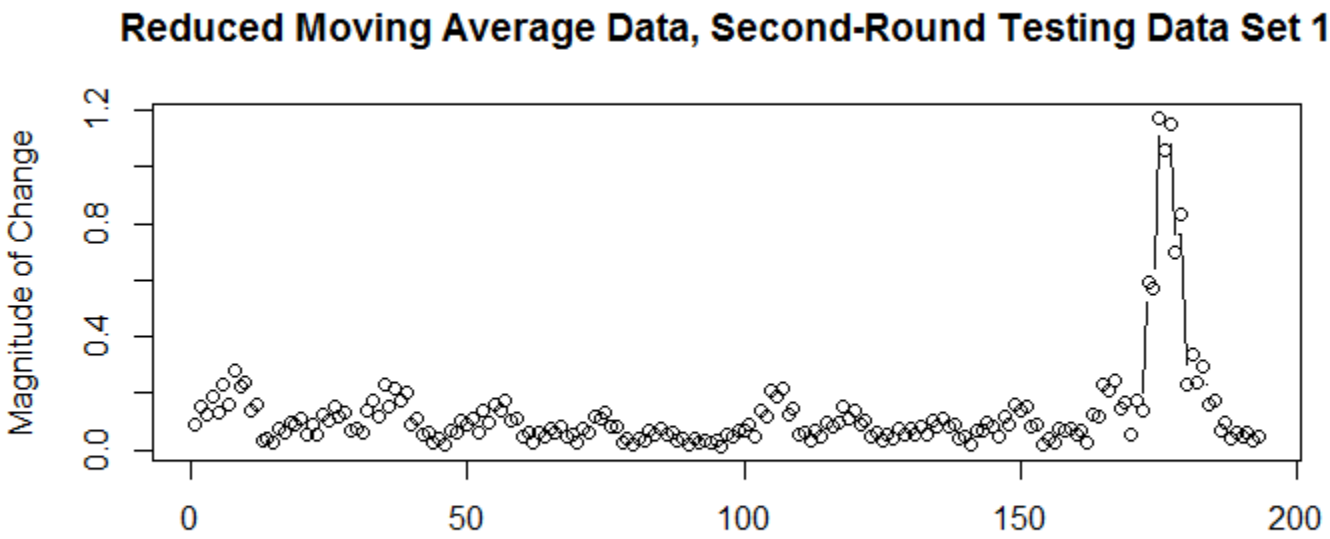



```
> plotx_t3 <- cbind(1:lenredu_t3); plot(plotx_t3, red3test, 'b', main = "Reduced Movin
g Average Data, First-Round Testing Data Set 3", xlab = "", ylab = "Magnitude of Chang
e")
```

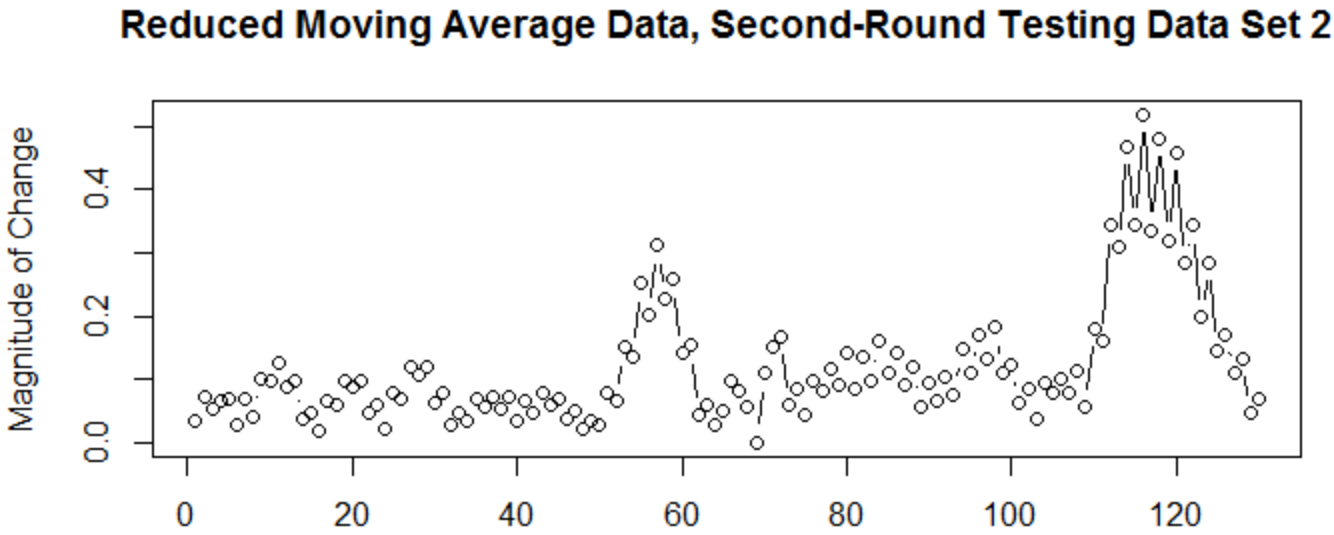



```
>
> # Second-Round Testing; Different Subject
> # Access Excel files
> learn1data <- read.table("C:\\Users\\Kate\\Documents\\MU\\MSCS 6050\\data\\Jahangir\
\person 1 event 2.csv", header=TRUE, sep=",")
> learn2data <- read.table("C:\\Users\\Kate\\Documents\\MU\\MSCS 6050\\data\\Jahangir\
\s1e3.csv", header=TRUE, sep=",")
> learn3data <- read.table("C:\\Users\\Kate\\Documents\\MU\\MSCS 6050\\data\\Jahangir\
\s1e4.csv", header=TRUE, sep=",")
> learn4data <- read.table("C:\\Users\\Kate\\Documents\\MU\\MSCS 6050\\data\\Jahangir\
\s1e5.csv", header=TRUE, sep=",")
> # Select data columns
> # ERROR BELOW WITH FOURTH PART
> a_l1 <- learn1data[,15]; a_l2 <- learn2data[,12]; a_l3 <- learn3data[,12]; a_l4 <- l
earn4data[,12]
Error in `[.data.frame`(learn4data, , 12) : undefined columns selected
> # Set missing first alpha value to zero
> a_l1[1] <- 0; a_l2[1] <- 0; a_l3[1] <- 0; a_l4[1] <- 0
> # Assign walking and falling index ranges
> normstart_l1 <- 271; fallstop_l1 <- 683
> normstart_l2 <- 164; fallstop_l2 <- 463
> normstart_l3 <- 63; fallstop_l3 <- 331
> normstart_l4 <- 47; fallstop_l4 <- 337
> # Useful segments of data set
> learnseg_l1 <- a_l1[normstart_l1:fallstop_l1]; learnseg_l2 <- a_l2[normstart_l2:fall
stop_l2]; learnseg_l3 <- a_l3[normstart_l3:fallstop_l3]; learnseg_l4 <- a_l4[normstart
_l4:fallstop_l4]
>
> # Moving average
> install.packages("zoo")
Error in install.packages : Updating loaded packages
> library(zoo)
> # Learning moving average
> learn1mvavg <- rollapply(data = learnseg_l1, width = 10, FUN = 'mean')
> learn2mvavg <- rollapply(data = learnseg_l2, width = 10, FUN = 'mean')
> learn3mvavg <- rollapply(data = learnseg_l3, width = 10, FUN = 'mean')
> learn4mvavg <- rollapply(data = learnseg_l4, width = 10, FUN = 'mean')
> lenavg_l1 <- length(learn1mvavg); lenavg_l2 <- length(learn2mvavg); lenavg_l3 <- len
gth(learn3mvavg); lenavg_l4 <- length(learn4mvavg)
> # # Value frequencies in subsets
> red1data <- 0; red2data <- 0; red3data <- 0; red4data <- 0
> red1data[1] <- learn1mvavg[1]; j <- 1; k <- 2; for (i in 2: lenavg_l1) if(abs(learn1
mvavg[i] - learn1mvavg[i-1]) > 0) { red1data[j] <- learn1mvavg[i]; j = j + 1 }
```

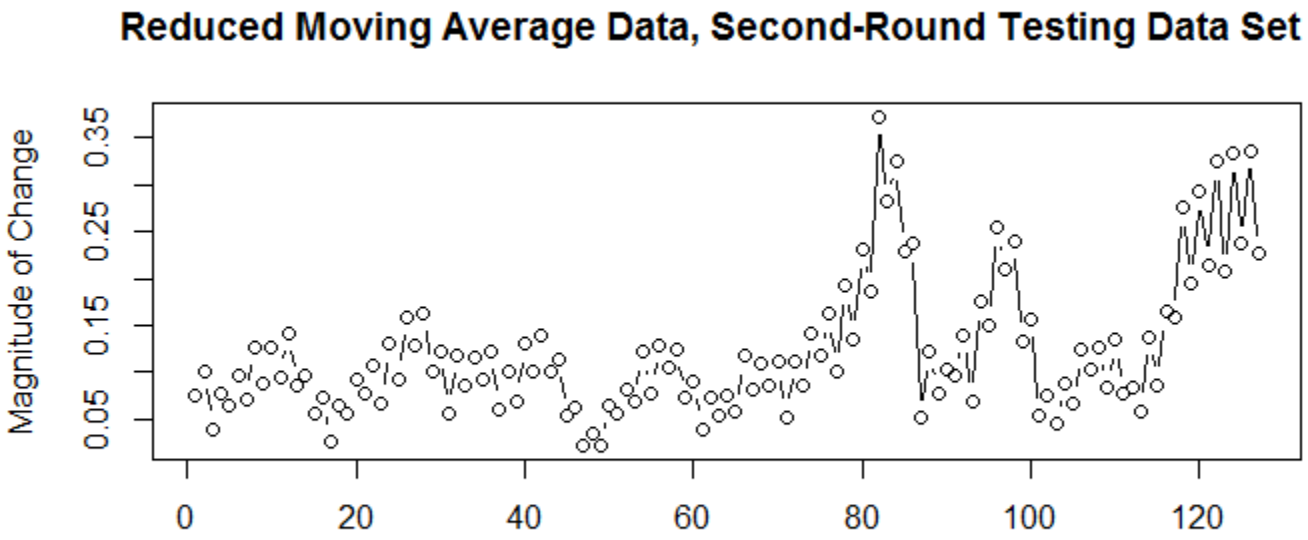
```
> red2data[1] <- learn2mvavg[1]; j <- 1; k <- 2; for (i in 2: lenavg_l2) if(abs(learn2
mvavg[i] - learn2mvavg[i-1]) > 0) { red2data[j] <- learn2mvavg[i]; j = j + 1 }
> red3data[1] <- learn3mvavg[1]; j <- 1; k <- 2; for (i in 2: lenavg_l3) if(abs(learn3
mvavg[i] - learn3mvavg[i-1]) > 0) { red3data[j] <- learn3mvavg[i]; j = j + 1 }
> red4data[1] <- learn4mvavg[1]; j <- 1; k <- 2; for (i in 2: lenavg_l4) if(abs(learn4
mvavg[i] - learn4mvavg[i-1]) > 0) { red4data[j] <- learn4mvavg[i]; j = j + 1 }
> # # Plot concatenated subsets cleaned of duplicated entries
> lenredu_l1 <- length(red1data); lenredu_l2 <- length(red2data); lenredu_l3 <- length
(red3data); lenredu_l4 <- length(red4data)
> plotx_l1 <- cbind(1:lenredu_l1); plot(plotx_l1, red1data, 'b', main = "Reduced Movin
g Average Data, Second-Round Testing Data Set 1", xlab = "", ylab = "Magnitude of Chan
ge")
```



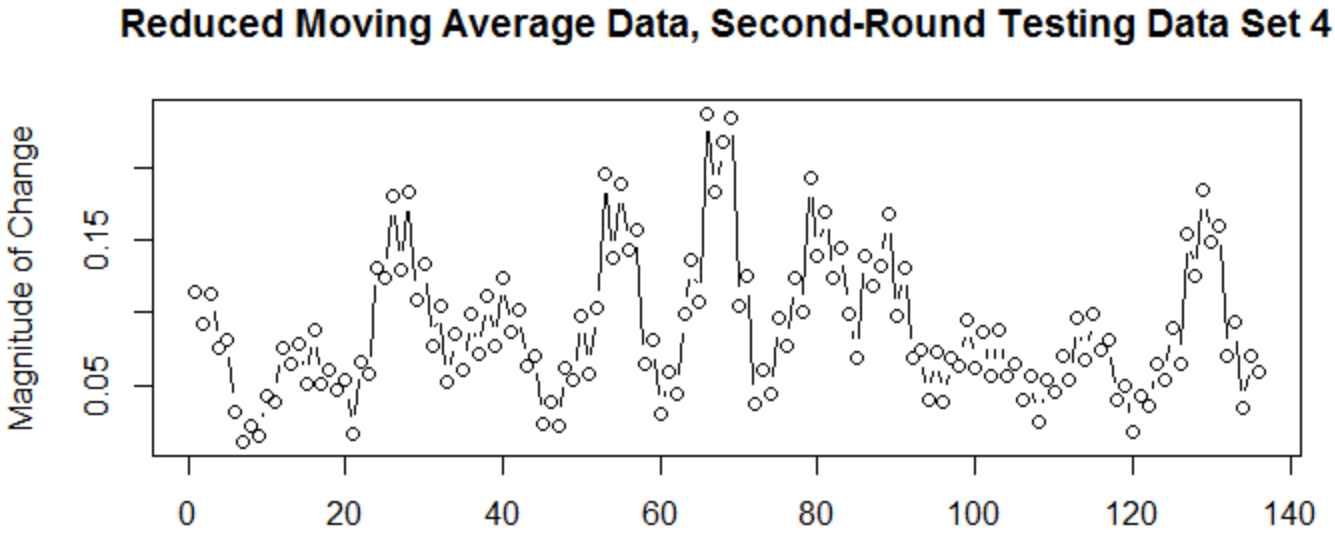

```
> plotx_l2 <- cbind(1:lenredu_l2); plot(plotx_l2, red2data, 'b', main = "Reduced Movin
g Average Data, Second-Round Testing Data Set 2", xlab = "", ylab = "Magnitude of Chan
ge")
```




```
> plotx_l3 <- cbind(1:lenredu_l3); plot(plotx_l3, red3data, 'b', main = "Reduced Movin
g Average Data, Second-Round Testing Data Set 3", xlab = "", ylab = "Magnitude of Chan
ge")
```




```
> plotx_l4 <- cbind(1:lenredu_l4); plot(plotx_l4, red4data, 'b', main = "Reduced Movin
g Average Data, Second-Round Testing Data Set 4", xlab = "", ylab = "Magnitude of Chan
ge")
```




```
> # # Methodology for Testing
> max_l1 <- red1data[15]; maxtest_l1 <- 0; maxdiff_l1 <- red1data[15] - red1data[21];
maxdifftest_l1 <- 0; fall_l1 <- 0; for (i in 1:lenredu_l1) fall_l1[i] <- 0
> for (i in 2:(lenredu_l1 - 5)) { if(red1data[i] > max_l1) {
+   maxtest_l1 <- red1data[i];
+   maxdifftest_l1 <- red1data[i] - red1data[i + 6]
+   if(maxdifftest_l1 > maxdiff_l1) {
+     fall_l1[i] <- 1;
+     max_l1 <- maxtest_l1;
+     maxdiff_l1 <- maxdifftest_l1
+   }
+ }
+ }
> fall_l1
```

```
  [1] 0 0 0 0 1 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
 [42] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
 [83] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[124] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[165] 0 0 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
> max_l2 <- red2data[15]; maxtest_l2 <- 0; maxdiff_l2 <- red2data[15] - red2data[21];
maxdifftest_l2 <- 0; fall_l2 <- 0; for (i in 1:lenredu_l2) fall_l2[i] <- 0
> for (i in 2:(lenredu_l2 - 5)) {
+   if(red2data[i] > max_l2) {
+     maxtest_l2 <- red2data[i];
+     maxdifftest_l2 <- red2data[i] - red2data[i + 6]
+     if(maxdifftest_l2 > maxdiff_l2) {
+       fall_l2[i] <- 1;
+       max_l2 <- maxtest_l2;
+       maxdiff_l2 <- maxdifftest_l2
+     }
+   }
+ }
> fall_l2
  [1] 0 1 0 0 0 0 0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
 [42] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
 [83] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0
0
[124] 0 0 0 0 0 0 0
> max_l3 <- red3data[15]; maxtest_l3 <- 0; maxdiff_l3 <- red3data[15] - red3data[21];
maxdifftest_l3 <- 0; fall_l3 <- 0; for (i in 1:lenredu_l3) fall_l3[i] <- 0
> for (i in 2:(lenredu_l3 - 5)) {
+   if(red3data[i] > max_l3) {
+     maxtest_l3 <- red3data[i];
+     maxdifftest_l3 <- red3data[i] - red3data[i + 6]
+     if(maxdifftest_l3 > maxdiff_l3) {
+       fall_l3[i] <- 1;
+       max_l3 <- maxtest_l3;
+       maxdiff_l3 <- maxdifftest_l3
+     }
+   }
+ }
> fall_l3
  [1] 0 0 0 0 0 0 1 1 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
 [42] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1
1
 [83] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
[124] 0 0 0 0
> max_l4 <- red4data[15]; maxtest_l4 <- 0; maxdiff_l4 <- red4data[15] - red4data[21];
maxdifftest_l4 <- 0; fall_l4 <- 0; for (i in 1:lenredu_l4) fall_l4[i] <- 0
> for (i in 2:(lenredu_l4 - 5)) {
+   if(red4data[i] > max_l4) {
+     maxtest_l4 <- red4data[i];
+     maxdifftest_l4 <- red4data[i] - red4data[i + 6]
+     if(maxdifftest_l4 > maxdiff_l4) {
+       fall_l4[i] <- 1;
+       max_l4 <- maxtest_l4;
+       maxdiff_l4 <- maxdifftest_l4
+     }
+   }
+ }
> fall_l4
  [1] 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
0
 [42] 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
 [83] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0
```

[124] 0 0 0 0 0 0 0 0 0 0 0 0 0 0