R Program To Create Plots For Performance Response Variables (res)

```
library(gdata)
library(xlsx)

path1 = "C:/Users/Devarsh Dani/Desktop/UH/Spring 2017/Statistical methods in research/HW1/Other Study Data"
pdf("C:/Users/Devarsh Dani/Desktop/finalRES.pdf", height = 30, width = 30)
par(mfrow = c(7,5))
#Iteration 1 PD

#SPEED for PD RES
setwd(path1)
dir = grep("T???/??PD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,3))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Speed"

 reading$Speed <- as.numeric(as.character(reading$Speed))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]
 invalidValue2 = which(reading$Speed<(0.1) & reading$Speed>(-0.1))

 invalidValue1 = which(reading$Speed<(-0.1))
 yvector = reading[,"Speed"]
 xvector = reading[,"Time"]
 if( length(invalidValue2) > 0) {

  yvector<-replace(yvector,invalidValue2,0)
  #xvector<-replace(xvector,invalidValue2,0)

 }

 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,NA)
  xvector<-replace(xvector,invalidValue1,NA)
```

R Program To Create Plots For Performance Response Variables (res)

```
 }

 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Speed[kmph]", main = "RES
Speed signal plotting for all PD")
legend("topright",legend = paste("n = ",n))

#ACCELERATION FOR PD RES
setwd(path1)
dir = grep("T???/??PD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,4))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "acceleration"

 reading$acceleration <- as.numeric(as.character(reading$acceleration))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]
 invalidValue1 = which(reading$acceleration<0)
 invalidValue2 = which(reading$acceleration > 90)

 if( length(invalidValue2) > 0) {

  setwd("../..")
  unlink(dir[i])
```

R Program To Create Plots For Performance Response Variables (res)

```
  next
 }
 yvector = reading[,"acceleration"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,NA)
  xvector<-replace(xvector,invalidValue1,NA)
 }
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Acceleration[∘]", main = "RES
Acceleration signal plotting for all PD")
legend("topright",legend = paste("n = ",n))

#BRAKING for PD RES
setwd(path1)
dir = grep("T???/??PD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,5))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Brake"

 reading$Brake <- as.numeric(as.character(reading$Brake))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]
```

R Program To Create Plots For Performance Response Variables (res)

```
 invalidValue1 = which(reading$Brake>300)

 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,300)

 }
 yvector = reading[,"Brake"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Brake[N]", main = "RES Brake
signal plotting for all PD")
legend("topright",legend = paste("n = ",n))


# STEERING FOR PD RES
setwd(path1)
dir = grep("T???/??PD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,6))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Steering"

 reading$Steering <- as.numeric(as.character(reading$Steering))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]
```

R Program To Create Plots For Performance Response Variables (res)

```
 #invalidValue1 = which(reading$Brake>300)


 #if( length(invalidValue1) > 0) {
 #  yvector<-replace(yvector,invalidValue1,300)

 #}
 yvector = reading[,"Steering"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Steering[rad]", main = "RES
Steering signal plotting for all PD")
legend("topright",legend = paste("n = ",n))


#LANE POSITION FOR PD RES
setwd(path1)
dir = grep("T???/??PD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,8))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "LanePosition"

 reading$LanePosition <- as.numeric(as.character(reading$LanePosition))
```

R Program To Create Plots For Performance Response Variables (res)

```
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]

 yvector = reading[,"LanePosition"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "LanePosition[m]", main = "RES
LanePosition signal plotting for all PD")
legend("topright",legend = paste("n = ",n))


#ITERATION 2 RD

setwd(path1)
dir = grep("T???/??RD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,3))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Speed"

 reading$Speed <- as.numeric(as.character(reading$Speed))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]
 invalidValue2 = which(reading$Speed<(0.1) & reading$Speed>(-0.1))
```

R Program To Create Plots For Performance Response Variables (res)

```
 invalidValue1 = which(reading$Speed<(-0.1))
 yvector = reading[,"Speed"]
 xvector = reading[,"Time"]
 if( length(invalidValue2) > 0) {

  yvector<-replace(yvector,invalidValue2,0)
  #xvector<-replace(xvector,invalidValue2,0)

 }

 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,NA)
  xvector<-replace(xvector,invalidValue1,NA)
 }

 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Speed[kmph]", main = "RES
Speed signal plotting for all RD")
legend("topright",legend = paste("n = ",n))

#ACCELERATION FOR RD RES
setwd(path1)
dir = grep("T???/??RD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,4))
```

R Program To Create Plots For Performance Response Variables (res)

```
 names(reading)[1] <- "Time"
 names(reading)[2] <- "acceleration"

 reading$acceleration <- as.numeric(as.character(reading$acceleration))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]
 invalidValue1 = which(reading$acceleration<0)
 invalidValue2 = which(reading$acceleration > 90)

 if( length(invalidValue2) > 0) {

  setwd("../..")
  unlink(dir[i])
  next
 }
 yvector = reading[,"acceleration"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,NA)
  xvector<-replace(xvector,invalidValue1,NA)
 }
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Acceleration[∘]", main = "RES
Acceleration signal plotting for all RD")
legend("topright",legend = paste("n = ",n))

#BRAKING for RD RES
setwd(path1)
dir = grep("T???/??RD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
```

R Program To Create Plots For Performance Response Variables (res)

```
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,5))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Brake"

 reading$Brake <- as.numeric(as.character(reading$Brake))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]

 invalidValue1 = which(reading$Brake>300)

 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,300)

 }
 yvector = reading[,"Brake"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Brake[N]", main = "RES Brake
signal plotting for all RD")
legend("topright",legend = paste("n = ",n))


# STEERING FOR RD RES
setwd(path1)
dir = grep("T???/??RD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
```

R Program To Create Plots For Performance Response Variables (res)

```
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,6))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Steering"

 reading$Steering <- as.numeric(as.character(reading$Steering))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]

 #invalidValue1 = which(reading$Brake>300)


 #if( length(invalidValue1) > 0) {
 #  yvector<-replace(yvector,invalidValue1,300)

 #}
 yvector = reading[,"Steering"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Steering[rad]", main = "RES
Steering signal plotting for all RD")
legend("topright",legend = paste("n = ",n))


#LANE POSITION FOR RD RES
setwd(path1)
dir = grep("T???/??RD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
```

R Program To Create Plots For Performance Response Variables (res)

```
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,8))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "LanePosition"

 reading$LanePosition <- as.numeric(as.character(reading$LanePosition))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]

 yvector = reading[,"LanePosition"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "LanePosition[m]", main = "RES
LanePosition signal plotting for all RD")
legend("topright",legend = paste("n = ",n))


#ITERATION 3 ND

setwd(path1)
dir = grep("T???/??ND", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
```

R Program To Create Plots For Performance Response Variables (res)

```
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,3))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Speed"

 reading$Speed <- as.numeric(as.character(reading$Speed))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]
 invalidValue2 = which(reading$Speed<(0.1) & reading$Speed>(-0.1))

 invalidValue1 = which(reading$Speed<(-0.1))
 yvector = reading[,"Speed"]
 xvector = reading[,"Time"]
 if( length(invalidValue2) > 0) {

  yvector<-replace(yvector,invalidValue2,0)
  #xvector<-replace(xvector,invalidValue2,0)

 }

 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,NA)
  xvector<-replace(xvector,invalidValue1,NA)
 }

 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Speed[kmph]", main = "RES
Speed signal plotting for all ND")
legend("topright",legend = paste("n = ",n))

#ACCELERATION FOR ND RES
setwd(path1)
dir = grep("T???/??ND", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
```

R Program To Create Plots For Performance Response Variables (res)

```
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,4))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "acceleration"

 reading$acceleration <- as.numeric(as.character(reading$acceleration))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]
 invalidValue1 = which(reading$acceleration<0)
 invalidValue2 = which(reading$acceleration > 90)

 if( length(invalidValue2) > 0) {

  setwd("../..")
  unlink(dir[i])
  next
 }
 yvector = reading[,"acceleration"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,NA)
  xvector<-replace(xvector,invalidValue1,NA)
 }
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time [sec]", ylab = "Acceleration[◦]", main = "RES
Acceleration signal plotting for all ND")
legend("topright",legend = paste("n = ",n))
```

R Program To Create Plots For Performance Response Variables (res)

```
#BRAKING for ND RES
setwd(path1)
dir = grep("T???/??ND", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,5))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Brake"

 reading$Brake <- as.numeric(as.character(reading$Brake))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]

 invalidValue1 = which(reading$Brake>300)

 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,300)

 }
 yvector = reading[,"Brake"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Brake[N]", main = "RES Brake
signal plotting for all ND")
legend("topright",legend = paste("n = ",n))
```

R Program To Create Plots For Performance Response Variables (res)

```
# STEERING FOR ND RES
setwd(path1)
dir = grep("T???/??ND", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,6))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Steering"

 reading$Steering <- as.numeric(as.character(reading$Steering))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]

 #invalidValue1 = which(reading$Steering>300)


 #if( length(invalidValue1) > 0) {
 # yvector<-replace(yvector,invalidValue1,300)

 #}
 yvector = reading[,"Steering"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}
```

R Program To Create Plots For Performance Response Variables (res)

```
plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Steering[rad]", main = "RES
Steering signal plotting for all ND")
legend("topright",legend = paste("n = ",n))


#LANE POSITION FOR ND RES
setwd(path1)
dir = grep("T???/??ND", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
  setwd(dir[i])
  fil = list.files(pattern = ".res")
  if(identical(fil, character(0))) {
    setwd("../..")
    unlink(dir[i])
    next
  }
  reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,8))

  names(reading)[1] <- "Time"
  names(reading)[2] <- "LanePosition"

  reading$LanePosition <- as.numeric(as.character(reading$LanePosition))
  reading$Time <- as.numeric(as.character(reading$Time))
  reading = reading[order(reading$Time), , drop = FALSE]

  yvector = reading[,"LanePosition"]
  xvector = reading[,"Time"]
  xvector = c(xvector,NA)
  yvector = c(yvector,NA)
  vectorForgraphx = append(vectorForgraphx, xvector)
  vectorForgraphy = append(vectorForgraphy, yvector)
  n = n+1

  setwd("../..")
  unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "LanePosition[m]", main = "RES
LanePosition signal plotting for all ND")
legend("topright",legend = paste("n = ",n))
```

R Program To Create Plots For Performance Response Variables (res)

```
#ITERATION 4 CD

setwd(path1)
dir = grep("T???/??CD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,3))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Speed"

 reading$Speed <- as.numeric(as.character(reading$Speed))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]
 invalidValue2 = which(reading$Speed<(0.1) & reading$Speed>(-0.1))

 invalidValue1 = which(reading$Speed<(-0.1))
 yvector = reading[,"Speed"]
 xvector = reading[,"Time"]
 if( length(invalidValue2) > 0) {

  yvector<-replace(yvector,invalidValue2,0)
  #xvector<-replace(xvector,invalidValue2,0)

 }

 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,NA)
  xvector<-replace(xvector,invalidValue1,NA)
 }

 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
```

R Program To Create Plots For Performance Response Variables (res)

```
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Speed[kmph]", main = "RES
Speed signal plotting for all CD")
legend("topright",legend = paste("n = ",n))

#ACCELERATION FOR CD RES
setwd(path1)
dir = grep("T???/??CD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,4))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "acceleration"

 reading$acceleration <- as.numeric(as.character(reading$acceleration))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]
 invalidValue1 = which(reading$acceleration<0)
 invalidValue2 = which(reading$acceleration > 90)

 if( length(invalidValue2) > 0) {

  setwd("../..")
  unlink(dir[i])
  next
 }
 yvector = reading[,"acceleration"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
```

R Program To Create Plots For Performance Response Variables (res)

```
 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,NA)
  xvector<-replace(xvector,invalidValue1,NA)
 }
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time [sec]", ylab = "Acceleration[◦]", main = "RES
Acceleration signal plotting for all CD")
legend("topright",legend = paste("n = ",n))

#BRAKING for CD RES
setwd(path1)
dir = grep("T???/??CD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,5))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Brake"

 reading$Brake <- as.numeric(as.character(reading$Brake))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]

 invalidValue1 = which(reading$Brake>300)

 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,300)

 }
```

R Program To Create Plots For Performance Response Variables (res)

```
  yvector = reading[,"Brake"]
  xvector = reading[,"Time"]
  xvector = c(xvector,NA)
  yvector = c(yvector,NA)
  vectorForgraphx = append(vectorForgraphx, xvector)
  vectorForgraphy = append(vectorForgraphy, yvector)
  n = n+1

  setwd("../..")
  unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Brake[N]", main = "RES Brake
signal plotting for all CD")
legend("topright",legend = paste("n = ",n))


# STEERING FOR CD RES
setwd(path1)
dir = grep("T???/??CD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
  setwd(dir[i])
  fil = list.files(pattern = ".res")
  if(identical(fil, character(0))) {
    setwd("../..")
    unlink(dir[i])
    next
  }
  reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,6))

  names(reading)[1] <- "Time"
  names(reading)[2] <- "Steering"

  reading$Steering <- as.numeric(as.character(reading$Steering))
  reading$Time <- as.numeric(as.character(reading$Time))
  reading = reading[order(reading$Time), , drop = FALSE]

  #invalidValue1 = which(reading$Brake>300)


  #if( length(invalidValue1) > 0) {
  #  yvector<-replace(yvector,invalidValue1,300)
```

R Program To Create Plots For Performance Response Variables (res)

```
 #}
 yvector = reading[,"Steering"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Steering[rad]", main = "RES
Steering signal plotting for all CD")
legend("topright",legend = paste("n = ",n))


#LANE POSITION FOR CD RES
setwd(path1)
dir = grep("T???/??CD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,8))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "LanePosition"

 reading$LanePosition <- as.numeric(as.character(reading$LanePosition))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]

 yvector = reading[,"LanePosition"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
```

R Program To Create Plots For Performance Response Variables (res)

```
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "LanePosition[m]", main = "RES
LanePosition signal plotting for all CD")
legend("topright",legend = paste("n = ",n))



#ITERATION 5 ED

setwd(path1)
dir = grep("T???/??ED", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,3))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Speed"

 reading$Speed <- as.numeric(as.character(reading$Speed))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]
 invalidValue2 = which(reading$Speed<(0.1) & reading$Speed>(-0.1))

 invalidValue1 = which(reading$Speed<(-0.1))
 yvector = reading[,"Speed"]
 xvector = reading[,"Time"]
 if( length(invalidValue2) > 0) {
```

R Program To Create Plots For Performance Response Variables (res)

```
  yvector<-replace(yvector,invalidValue2,0)
  #xvector<-replace(xvector,invalidValue2,0)

 }

 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,NA)
  xvector<-replace(xvector,invalidValue1,NA)
 }

 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Speed[kmph]", main = "RES
Speed signal plotting for all ED")
legend("topright",legend = paste("n = ",n))

#ACCELERATION FOR ED RES
setwd(path1)
dir = grep("T???/??ED", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,4))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "acceleration"

 reading$acceleration <- as.numeric(as.character(reading$acceleration))
 reading$Time <- as.numeric(as.character(reading$Time))
```

R Program To Create Plots For Performance Response Variables (res)

```
 reading = reading[order(reading$Time), , drop = FALSE]
 invalidValue1 = which(reading$acceleration<0)
 invalidValue2 = which(reading$acceleration > 90)

 if( length(invalidValue2) > 0) {

  setwd("../..")
  unlink(dir[i])
  next
 }
 yvector = reading[,"acceleration"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,NA)
  xvector<-replace(xvector,invalidValue1,NA)
 }
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time [sec]", ylab = "Acceleration[◦]", main = "RES
Acceleration signal plotting for all ED")
legend("topright",legend = paste("n = ",n))

#BRAKING for ED RES
setwd(path1)
dir = grep("T???/??ED", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,5))
```

R Program To Create Plots For Performance Response Variables (res)

```
 names(reading)[1] <- "Time"
 names(reading)[2] <- "Brake"

 reading$Brake <- as.numeric(as.character(reading$Brake))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]

 invalidValue1 = which(reading$Brake>300)

 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,300)

 }
 yvector = reading[,"Brake"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Brake[N]", main = "RES Brake
signal plotting for all ED")
legend("topright",legend = paste("n = ",n))


# STEERING FOR ED RES
setwd(path1)
dir = grep("T???/??ED", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
```

R Program To Create Plots For Performance Response Variables (res)

```
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,6))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Steering"

 reading$Steering <- as.numeric(as.character(reading$Steering))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]

 #invalidValue1 = which(reading$Brake>300)


 #if( length(invalidValue1) > 0) {
 #  yvector<-replace(yvector,invalidValue1,300)

 #}
 yvector = reading[,"Steering"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Steering[rad]", main = "RES
Steering signal plotting for all ED")
legend("topright",legend = paste("n = ",n))


#LANE POSITION FOR ED RES
setwd(path1)
dir = grep("T???/??ED", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
```

R Program To Create Plots For Performance Response Variables (res)

```
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,8))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "LanePosition"

 reading$LanePosition <- as.numeric(as.character(reading$LanePosition))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]

 yvector = reading[,"LanePosition"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "LanePosition[m]", main = "RES
LanePosition signal plotting for all ED")
legend("topright",legend = paste("n = ",n))



#ITERATION 6 MD

setwd(path1)
dir = grep("T???/??MD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,3))
```

R Program To Create Plots For Performance Response Variables (res)

```
 names(reading)[1] <- "Time"
 names(reading)[2] <- "Speed"

 reading$Speed <- as.numeric(as.character(reading$Speed))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]
 invalidValue2 = which(reading$Speed<(0.1) & reading$Speed>(-0.1))

 invalidValue1 = which(reading$Speed<(-0.1))
 yvector = reading[,"Speed"]
 xvector = reading[,"Time"]
 if( length(invalidValue2) > 0) {

  yvector<-replace(yvector,invalidValue2,0)
  #xvector<-replace(xvector,invalidValue2,0)

 }

 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,NA)
  xvector<-replace(xvector,invalidValue1,NA)
 }

 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Speed[kmph]", main = "RES
Speed signal plotting for all MD")
legend("topright",legend = paste("n = ",n))

#ACCELERATION FOR MD RES
setwd(path1)
dir = grep("T???/??MD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
```

R Program To Create Plots For Performance Response Variables (res)

```
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,4))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "acceleration"

 reading$acceleration <- as.numeric(as.character(reading$acceleration))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]
 invalidValue1 = which(reading$acceleration<0)
 invalidValue2 = which(reading$acceleration > 90)

 if( length(invalidValue2) > 0) {

  setwd("../..")
  unlink(dir[i])
  next
 }
 yvector = reading[,"acceleration"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,NA)
  xvector<-replace(xvector,invalidValue1,NA)
 }
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time [sec]", ylab = "Acceleration[◦]", main = "RES
Acceleration signal plotting for all MD")
legend("topright",legend = paste("n = ",n))

#BRAKING for MD RES
setwd(path1)
dir = grep("T???/??MD", list.dirs(), value = TRUE)
```

R Program To Create Plots For Performance Response Variables (res)

```
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
  setwd(dir[i])
  fil = list.files(pattern = ".res")
  if(identical(fil, character(0))) {
    setwd("../..")
    unlink(dir[i])
    next
  }
  reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,5))

  names(reading)[1] <- "Time"
  names(reading)[2] <- "Brake"

  reading$Brake <- as.numeric(as.character(reading$Brake))
  reading$Time <- as.numeric(as.character(reading$Time))
  reading = reading[order(reading$Time), , drop = FALSE]

  invalidValue1 = which(reading$Brake>300)

  if( length(invalidValue1) > 0) {
    yvector<-replace(yvector,invalidValue1,300)

  }
  yvector = reading[,"Brake"]
  xvector = reading[,"Time"]
  xvector = c(xvector,NA)
  yvector = c(yvector,NA)
  vectorForgraphx = append(vectorForgraphx, xvector)
  vectorForgraphy = append(vectorForgraphy, yvector)
  n = n+1

  setwd("../..")
  unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Brake[N]", main = "RES Brake
signal plotting for all MD")
legend("topright",legend = paste("n = ",n))


# STEERING FOR MD RES
setwd(path1)
```

R Program To Create Plots For Performance Response Variables (res)

```
dir = grep("T???/??MD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,6))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Steering"

 reading$Steering <- as.numeric(as.character(reading$Steering))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]

 #invalidValue1 = which(reading$Brake>300)


 #if( length(invalidValue1) > 0) {
 #  yvector<-replace(yvector,invalidValue1,300)

 #}
 yvector = reading[,"Steering"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Steering[rad]", main = "RES
Steering signal plotting for all MD")
legend("topright",legend = paste("n = ",n))
```

R Program To Create Plots For Performance Response Variables (res)

```
#LANE POSITION FOR MD RES
setwd(path1)
dir = grep("T???/??MD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,8))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "LanePosition"

 reading$LanePosition <- as.numeric(as.character(reading$LanePosition))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]

 yvector = reading[,"LanePosition"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "LanePosition[m]", main = "RES
LanePosition signal plotting for all MD")
legend("topright",legend = paste("n = ",n))



#ITERATION 7 FD

setwd(path1)
dir = grep("T???/??FD", list.dirs(), value = TRUE)
```

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```
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,3))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Speed"

 reading$Speed <- as.numeric(as.character(reading$Speed))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]
 invalidValue2 = which(reading$Speed<(0.1) & reading$Speed>(-0.1))

 invalidValue1 = which(reading$Speed<(-0.1))
 yvector = reading[,"Speed"]
 xvector = reading[,"Time"]
 if( length(invalidValue2) > 0) {

  yvector<-replace(yvector,invalidValue2,0)
  #xvector<-replace(xvector,invalidValue2,0)

 }

 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,NA)
  xvector<-replace(xvector,invalidValue1,NA)
 }

 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}
```

R Program To Create Plots For Performance Response Variables (res)

```
plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Speed[kmph]", main = "RES
Speed signal plotting for all FD")
legend("topright",legend = paste("n = ",n))

#ACCELERATION FOR FD RES
setwd(path1)
dir = grep("T???/??FD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,4))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "acceleration"

 reading$acceleration <- as.numeric(as.character(reading$acceleration))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]
 invalidValue1 = which(reading$acceleration<0)
 invalidValue2 = which(reading$acceleration > 90)

 if( length(invalidValue2) > 0) {

  setwd("../..")
  unlink(dir[i])
  next
 }
 yvector = reading[,"acceleration"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,NA)
  xvector<-replace(xvector,invalidValue1,NA)
 }
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
```

R Program To Create Plots For Performance Response Variables (res)

```
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Acceleration[∘]", main = "RES
Acceleration signal plotting for all FD")
legend("topright",legend = paste("n = ",n))

#BRAKING for FD RES
setwd(path1)
dir = grep("T???/??FD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,5))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Brake"

 reading$Brake <- as.numeric(as.character(reading$Brake))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]

 invalidValue1 = which(reading$Brake>300)

 if( length(invalidValue1) > 0) {
  yvector<-replace(yvector,invalidValue1,300)

 }
 yvector = reading[,"Brake"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
```

R Program To Create Plots For Performance Response Variables (res)

```
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Brake[N]", main = "RES Brake
signal plotting for all FD")
legend("topright",legend = paste("n = ",n))


# STEERING FOR FD RES
setwd(path1)
dir = grep("T???/??FD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,6))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "Steering"

 reading$Steering <- as.numeric(as.character(reading$Steering))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]

 #invalidValue1 = which(reading$Brake>300)


 #if( length(invalidValue1) > 0) {
 #  yvector<-replace(yvector,invalidValue1,300)

 #}
 yvector = reading[,"Steering"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
```

R Program To Create Plots For Performance Response Variables (res)

```
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
 unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "Steering[rad]", main = "RES
Steering signal plotting for all FD")
legend("topright",legend = paste("n = ",n))


#LANE POSITION FOR FD RES
setwd(path1)
dir = grep("T???/??FD", list.dirs(), value = TRUE)
unlink(path1)
vectorForgraphx = NULL
vectorForgraphy = NULL
n=0
i=1
for(i in 1:length(dir)) {
 setwd(dir[i])
 fil = list.files(pattern = ".res")
 if(identical(fil, character(0))) {
  setwd("../..")
  unlink(dir[i])
  next
 }
 reading = read.xlsx(fil, sheetIndex = 1,colIndex = c(2,8))

 names(reading)[1] <- "Time"
 names(reading)[2] <- "LanePosition"

 reading$LanePosition <- as.numeric(as.character(reading$LanePosition))
 reading$Time <- as.numeric(as.character(reading$Time))
 reading = reading[order(reading$Time), , drop = FALSE]

 yvector = reading[,"LanePosition"]
 xvector = reading[,"Time"]
 xvector = c(xvector,NA)
 yvector = c(yvector,NA)
 vectorForgraphx = append(vectorForgraphx, xvector)
 vectorForgraphy = append(vectorForgraphy, yvector)
 n = n+1

 setwd("../..")
```

R Program To Create Plots For Performance Response Variables (res)

```
  unlink(dir[i])
}

plot(vectorForgraphx[seq(1, length(vectorForgraphx), 1)], vectorForgraphy[seq(1,
length(vectorForgraphy), 1)], lty = 1, type = "l", xlab = "Time[sec]", ylab = "LanePosition[m]", main = "RES
LanePosition signal plotting for all FD")
legend("topright",legend = paste("n = ",n))



dev.off()
```