```r
rm(list=ls())
getwd()

## [1] "/home/gquinn/Desktop/html/stonehill/SURE/Summer2015/NURE2015"

files=list.files("experiment3")
str(files)

##  chr [1:100] "experiment3_sample70_06242015100757.Rdata" ...

n=length(files)
print(n)

## [1] 100

#files
for (i in 1:n){
  fname=paste("experiment3/",files[[i]],sep="")
  load(fname)
  ls()
  if(i==1){
    df=data.frame(rep(c(1,2,3),1+nrow(MCAS_sgp$Panel_Data)/3)[1:nrow(MCAS_sgp$Panel_Data)])
    colnames(df)=c("levels")
  }
  df=cbind(df,MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP)
}
str(df)

## 'data.frame': 70000 obs. of  101 variables:
##  $ levels                                  : num  1 2 3 1 2 3 1 2 3 1 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  53 93 29 57 26 81 22 46 24 97 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  38 12 34 94 25 52 24 1 66 6 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  67 5 26 85 30 71 42 6 59 99 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  53 76 19 92 6 40 24 83 45 14 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  66 97 36 99 28 50 14 60 66 4 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  54 12 32 34 5 66 9 92 32 63 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  54 14 25 30 34 52 12 1 52 20 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  64 2 21 94 97 74 3 10 14 2 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  57 88 15 39 95 40 34 61 12 6 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  66 96 8 28 26 54 7 74 14 86 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  38 3 23 64 16 61 18 84 23 7 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  14 3 20 94 10 66 42 99 58 92 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  74 77 37 11 24 20 23 87 49 4 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  38 26 30 82 10 39 12 88 48 96 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  49 98 27 45 97 50 2 80 42 23 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  46 83 40 30 25 50 32 84 66 14 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  58 12 43 54 12 50 1 73 23 23 ...
```

```
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   59 93 24 37 83 88 25 73 49 3 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   71 96 28 98 90 52 9 82 52 1 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   7 26 22 43 88 42 23 84 23 89 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   24 3 37 79 96 71 23 91 49 2 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   46 27 40 51 5 31 95 6 24 6 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   34 7 46 86 10 51 34 44 36 88 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   64 4 16 99 12 87 14 88 71 36 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   66 10 16 16 23 53 14 5 66 6 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   36 16 20 92 34 43 32 54 54 38 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   32 69 38 41 94 53 12 6 22 73 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   22 25 33 26 98 53 99 80 12 4 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   20 2 23 22 14 38 11 54 62 10 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   31 14 21 20 6 31 91 13 31 13 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   55 9 28 90 5 52 97 95 24 7 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   32 84 37 15 97 43 30 98 23 4 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   66 6 72 78 5 53 2 51 66 9 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   54 28 25 16 14 51 13 54 32 10 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   67 6 22 27 4 71 18 88 65 69 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   8 14 59 40 87 74 24 79 54 92 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   46 25 17 63 5 43 49 34 38 97 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   41 19 25 57 77 50 20 67 56 1 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   54 15 38 76 72 32 46 97 32 6 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   71 96 19 95 10 66 7 37 49 23 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   41 3 41 58 97 71 5 1 62 6 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   22 87 34 85 23 49 12 69 14 6 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   66 7 41 84 1 74 14 6 32 99 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   5 17 15 96 8 53 19 57 7 9 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   53 80 41 91 37 81 8 3 5 95 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   52 98 19 95 99 20 2 65 66 6 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   54 91 36 79 10 77 32 87 56 28 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   57 81 50 27 28 39 48 80 48 10 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   65 3 19 31 3 74 6 83 48 9 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   23 90 35 89 13 67 1 94 32 9 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   64 15 21 92 96 32 49 97 58 81 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   23 97 37 58 6 23 9 43 52 94 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   48 14 20 69 12 53 66 68 4 6 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   53 92 25 87 3 49 3 96 24 16 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   46 92 22 46 9 74 95 74 67 1 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   46 87 45 98 7 64 9 97 62 9 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   25 4 18 38 9 43 26 6 71 28 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   15 78 36 95 84 21 7 76 71 19 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   28 71 20 99 4 53 43 92 14 71 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   36 35 20 99 74 51 96 64 44 14 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   71 9 26 33 4 43 28 76 17 9 ...
##  $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int   42 96 30 26 4 80 7 67 56 72 ...
```

```
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  22 10 31 77 3 74 6 83 66 35 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  31 12 84 39 67 51 6 84 73 5 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  17 3 39 33 26 50 97 3 32 19 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  48 5 25 89 23 54 22 88 67 12 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  55 3 24 24 23 81 48 65 31 91 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  59 22 25 91 8 39 41 94 59 5 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  30 2 37 84 99 51 24 88 6 35 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  24 81 23 69 98 39 48 82 21 96 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  7 92 32 76 71 51 14 97 54 4 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  66 5 20 83 6 66 58 54 5 22 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  57 4 43 16 6 50 32 76 66 6 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  36 22 9 99 4 51 2 99 59 9 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  35 2 30 34 98 43 15 76 6 71 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  67 15 16 16 23 43 34 95 22 5 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  35 83 15 57 23 50 14 80 72 10 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  7 2 33 97 20 53 99 87 20 28 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  58 3 32 72 7 51 14 72 14 7 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  46 10 31 13 2 43 14 89 32 5 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  46 96 61 65 12 52 1 60 32 91 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  55 14 22 95 12 89 14 68 39 96 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  66 95 38 35 6 52 23 47 15 77 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  34 10 22 1 4 39 18 57 71 83 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  62 73 19 89 34 54 10 48 5 12 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  24 93 16 86 1 43 11 76 21 14 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  15 69 19 68 66 50 34 81 5 79 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  64 4 78 86 96 22 54 89 66 1 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  66 62 38 98 14 64 48 81 18 79 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  14 6 17 37 15 43 43 68 46 99 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  14 5 12 79 10 43 23 45 11 23 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  53 70 42 85 30 55 97 77 32 6 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  53 71 42 92 11 12 23 73 14 6 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  38 84 19 32 4 51 48 65 59 14 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  55 3 33 92 2 74 66 59 57 98 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  22 97 31 75 96 55 5 88 17 98 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  36 99 26 98 10 52 40 99 23 89 ...
## $ MCAS_sgp$SGPercentiles$MATHEMATICS.2010$SGP: int  32 4 81 99 95 50 6 65 43 97 ...
## [list output truncated]
```

```
means=apply(df[,2:ncol(df)],1,mean)
sds=apply(df[,2:ncol(df)],1,sd)
levels=as.factor(rep(c(1,2,3),1+length(means)/3))[1:length(means)]
df2=data.frame(levels,means,sds)
str(df2)
```

```
## 'data.frame': 70000 obs. of  3 variables:
## $ levels: Factor w/ 3 levels "1","2","3": 1 2 3 1 2 3 1 2 3 1 ...
```

```
##  $ means : num  43.2 41 30.6 63.5 34.6 ...
##  $ sds   : num  18.6 38.2 14.5 29.4 35.7 ...

dfs=split(df2,df2$levels)
mean(dfs[[1]]$means)

## [1] 51.67756

sd(dfs[[1]]$means)

## [1] 14.77563

mean(dfs[[2]]$means)

## [1] 48.30727

sd(dfs[[2]]$means)

## [1] 13.22405

mean(dfs[[3]]$means)

## [1] 44.62666

sd(dfs[[3]]$means)

## [1] 14.61164
```