

## Project 1

### Exploratory Data Analysis

```
Health<-read.csv("Health_Sciences_Data_File_project1.csv")
```

Summary Statistics:

Transformed variables

```
summary(Health$avgSF)
```

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
4.00	13.83	18.87	19.71	24.83	51.67	1596

```
summary(Health$avgGM)
```

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
14.00	29.00	34.50	37.76	46.50	80.50

```
summary(Health$avgPL)
```

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
50.00	50.00	76.67	83.86	108.33	158.33	380

```
summary(Health$avgRPE)
```

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
6.00	10.33	11.33	11.46	12.67	18.00	393

```
summary(Health$avgSF)
```

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
4.00	13.83	18.87	19.71	24.83	51.67	1596

### Approximating Total Fitness Factor Score 5 Combinations

#Randomly Shuffle the data

```
Health <- Health[sample(nrow(Health)),]
```

#create 10 equally size folds

```
Folds <- cut(seq(1,nrow(Health)),breaks=10,labels=FALSE)
```

#Perform 10 fold cross-validation

```
for(i in 1:10){  
  #segmenting the data by fold using the which() function  
  testIndexes <- which(folds == i,arr.ind=TRUE)  
  testData <- Health[testIndexes,]  
  trainData <- Health[-testIndexes,]  
}
```

RMSE

Root Mean Squared Error 1-5;

Plots

Transformed variables:

Average Skinfold = (SF1 +SF2+SF3) /3

```
Health$avgSF<-(Health$SF.1+Health$SF.2+Health$SF.3)/3
```

Average grip = RGM+LGM/2

```

Health$avgGM <- (Health$RGM+Health$LGM)/2
Average Power= (PL1+PL2+PL3)/3
Health$avgPL <- (Health$PL.1+Health$PL.2+Health$PL.3)/3
Average Heart Rate= (HR 1 + HR 2 +HR 3 )/3
Health$avgHR <- (Health$HR.1+Health$HR.2+Health$HR.3)/3
Average Perceived Exertion: (RPE 1 + RPE 2 +RPE 3)/3
Health$avgRPE <- (Health$RPE.1+Health$RPE.2+Health$RPE.3)/3

```

## Models

```

Model1 <- lm(FF1
~Health$avgSF+Health$avgGM+Health$avgPL+Health$HR+Health$RPE+Health$FF)
Model2<-lm(FF1~Health$avgSF+Health$avgGM+Health$avgPL+Health$HR+Health$RPE+Hea
lth$VC+Health$TA)
Model3<-lm(FF1~Health$avgSF+Health$avgGM+Health$avgPL+Health$HR+Health$RPE+Hea
lth$SBP+Health$DBP)
Model4<-lm(FF1~Health$avgSF+Health$avgGM+Health$avgPL+Health$HR+Health$RPE)
Model5<-lm(FF1~Health$avgSF+Health$avgGM+Health$avgPL+Health$HR+Health$RPE)

```