# Basic Lupus Data Metrics

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```r
lupus<-read.table("lupustherm.txt")
data.temp<-as.matrix(lupus[,1:451])
classes.temp<-as.numeric(lupus[,452])
argvals=seq(45.0, 90.0, 0.1)

df.l <- data.frame(data.temp)

gen <- function(df, f){
  apply(df, 1, FUN=f)
}

gen_peaks <- function(x,p){
  peaklist <- c()
  peak <- 0
  for (i in 1:length(x)){
    if (x[i] > peak) {peak <- x[i]}
  }
  sort(peaklist)[length(peaklist)-p]
}

temp <- seq(45.0, 90.0, by=0.1)
samples <- nrow(df.l)

df.stats <- data.frame(Sample=seq(1, nrow(df.l), by=1))
df.stats$mean <- apply(df.l, 1, mean)
df.stats$median <- apply(df.l, 1, median)
df.stats$sd <- apply(df.l, 1, sd)
df.stats$min <- apply(df.l, 1, min)
df.stats$tarea <- apply(df.l, 1, function(x) sum(x)*0.1)
df.stats$peak1 <- apply(df.l, 1, max)
df.stats$tpeak1 <- temp[apply(df.l, 1, which.max)]
# for (i in 1:nrow(df.l)){df.stats$peak2[i] <-
#   gen_peaks(df.l[i:i,], 1)}
# for (i in 1:nrow(df.l)){df.stats$tpeak2[i] <-
#   temp[match(df.stats$peak2[i], df.l[i:i,])]}
# df.stats$peak12ratio <- df.stats$peak1/df.stats$peak2
df.stats$tfm <- apply(df.l, 1, function(x) sum(x*temp)/sum(x))
# head(df.stats, 10)

x=1
t.vector <- as.numeric(df.l[1:1,])
```

```r
peaklist <- c()
  peak <- 0
  for (i in 1:length(t.vector)){
    if (t.vector[i] > peak) {
      peak <- t.vector[i]
      peaklist <- c(peaklist, peak)
    } else if (t.vector[i] < peak){
      print(t.vector[i+1])
      peaklist <- c(peaklist, peak)
    }
  }
```

```
## [1] 0.000877
## [1] 0.000343
## [1] 0.0003755
## [1] 0.001143
## [1] 0.0004105
## [1] 0.000648
## [1] 0.000135
## [1] 0.000204
## [1] 0.00098917
## [1] 0.0013
## [1] 0.0005605
## [1] 0.00032575
## [1] 0.001725
## [1] 0.00133
## [1] 0.0005535
## [1] 0.001302
## [1] 0.000894
## [1] 0.0006845
## [1] 0.000753
## [1] 0.0007225
## [1] 0.0010915
## [1] 0.00165
## [1] 0.0011205
## [1] 0.00154
## [1] 0.001313
## [1] 0.00213
## [1] 0.002455
## [1] 0.002965
## [1] 0.00285
## [1] 0.003915
## [1] 0.00413
## [1] 0.00591
## [1] 0.006085
## [1] 0.006755
## [1] 0.00807
## [1] 0.00803
```

```
## [1] 0.008705
## [1] 0.009965
## [1] 0.01018
## [1] 0.01096
## [1] 0.01147
## [1] 0.011285
## [1] 0.01142
## [1] 0.01173
## [1] 0.01049
## [1] 0.01152
## [1] 0.010635
## [1] 0.01112
## [1] 0.010475
## [1] 0.01092
## [1] 0.01134
## [1] 0.011045
## [1] 0.01014
## [1] 0.010735
## [1] 0.01008
## [1] 0.010255
## [1] 0.009585
## [1] 0.0098
## [1] 0.00939
## [1] 0.010295
## [1] 0.01015
## [1] 0.01079
## [1] 0.01025
## [1] 0.00962
## [1] 0.00955
## [1] 0.009885
## [1] 0.00967
## [1] 0.009655
## [1] 0.010095
## [1] 0.009475
## [1] 0.010845
## [1] 0.01051
## [1] 0.01057
## [1] 0.01014
## [1] 0.010745
## [1] 0.010465
## [1] 0.011545
## [1] 0.01116
## [1] 0.01124
## [1] 0.011375
## [1] 0.012285
## [1] 0.012515
## [1] 0.013115
## [1] 0.013145
## [1] 0.01304
```

```
## [1] 0.014155
## [1] 0.01526
## [1] 0.01503
## [1] 0.01592
## [1] 0.016475
## [1] 0.021625
## [1] 0.02488
## [1] 0.10384
## [1] 0.104685
## [1] 0.301305
## [1] 0.304025
## [1] 0.30311
## [1] 0.3021
## [1] 0.30145
## [1] 0.29996
## [1] 0.29945
## [1] 0.298385
## [1] 0.297115
## [1] 0.295135
## [1] 0.293645
## [1] 0.291635
## [1] 0.29034
## [1] 0.288195
## [1] 0.286055
## [1] 0.284055
## [1] 0.283425
## [1] 0.2804
## [1] 0.279065
## [1] 0.277105
## [1] 0.276125
## [1] 0.275745
## [1] 0.274065
## [1] 0.273795
## [1] 0.272255
## [1] 0.271335
## [1] 0.27061
## [1] 0.268905
## [1] 0.268605
## [1] 0.26818
## [1] 0.267825
## [1] 0.267655
## [1] 0.266855
## [1] 0.266235
## [1] 0.26672
## [1] 0.265575
## [1] 0.265225
## [1] 0.265595
## [1] 0.26455
## [1] 0.2645
```

```
## [1] 0.264065
## [1] 0.263125
## [1] 0.26222
## [1] 0.262015
## [1] 0.261345
## [1] 0.26031
## [1] 0.259665
## [1] 0.25923
## [1] 0.257515
## [1] 0.25744
## [1] 0.25637
## [1] 0.255495
## [1] 0.25421
## [1] 0.253645
## [1] 0.25166
## [1] 0.251165
## [1] 0.24944
## [1] 0.24813
## [1] 0.24579
## [1] 0.244625
## [1] 0.24285
## [1] 0.240205
## [1] 0.23875
## [1] 0.235945
## [1] 0.234275
## [1] 0.232515
## [1] 0.2292
## [1] 0.22675
## [1] 0.225185
## [1] 0.221965
## [1] 0.21919
## [1] 0.21618
## [1] 0.214095
## [1] 0.210865
## [1] 0.20845
## [1] 0.20537
## [1] 0.2017
## [1] 0.198855
## [1] 0.19596
## [1] 0.19237
## [1] 0.18921
## [1] 0.18603
## [1] 0.18405
## [1] 0.18023
## [1] 0.17742
## [1] 0.174615
## [1] 0.171375
## [1] 0.16873
## [1] 0.16501
```

```
## [1] 0.16261
## [1] 0.15908
## [1] 0.15641
## [1] 0.153305
## [1] 0.1497
## [1] 0.145825
## [1] 0.142955
## [1] 0.14143
## [1] 0.137755
## [1] 0.13501
## [1] 0.13203
## [1] 0.1281
## [1] 0.12556
## [1] 0.12273
## [1] 0.120745
## [1] 0.118365
## [1] 0.11397
## [1] 0.111535
## [1] 0.10939
## [1] 0.106365
## [1] 0.104095
## [1] 0.10189
## [1] 0.098775
## [1] 0.096615
## [1] 0.09425
## [1] 0.09202
## [1] 0.089705
## [1] 0.0876
## [1] 0.084235
## [1] 0.082765
## [1] 0.080765
## [1] 0.078745
## [1] 0.07625
## [1] 0.07408
## [1] 0.07206
## [1] 0.070055
## [1] 0.068525
## [1] 0.06519
## [1] 0.063725
## [1] 0.061635
## [1] 0.059425
## [1] 0.05721
## [1] 0.055435
## [1] 0.0531
## [1] 0.05058
## [1] 0.048505
## [1] 0.04646
## [1] 0.04428
## [1] 0.042795
```

```
## [1] 0.041385
## [1] 0.039225
## [1] 0.037125
## [1] 0.03526
## [1] 0.03298
## [1] 0.031415
## [1] 0.02905
## [1] 0.02736
## [1] 0.025265
## [1] 0.0237
## [1] 0.02228
## [1] 0.0201
## [1] 0.01882
## [1] 0.01796
## [1] 0.01618
## [1] 0.014635
## [1] 0.013865
## [1] 0.01189
## [1] 0.01051
## [1] 0.008845
## [1] 0.008635
## [1] 0.007035
## [1] 0.00664
## [1] 0.00581
## [1] 0.005485
## [1] 0.004735
## [1] 0.002985
## [1] 0.003455
## [1] 0.00297
## [1] 0.0004285
## [1] 0.000193
## [1] 0.0005455
## [1] -0.0002845
## [1] 0.0005315
## [1] -0.0001035
## [1] 0.00059332
## [1] 0.0002235
## [1] 0.00030995
## [1] -0.000235
## [1] 0.00011325
## [1] -6.35e-05
## [1] -0.000651
## [1] 0.0010025
## [1] -0.00047985
## [1] -6.85e-05
## [1] -0.00039905
## [1] 0.000296
## [1] -0.0005085
## [1] -0.0002385
```

```
## [1] -0.000852
## [1] -0.0002433
## [1] 0.000315
## [1] -0.000534
## [1] 4.35e-05
## [1] NA
```

```
print(peaklist)
```

```
##   [1] 0.000975 0.001775 0.001775 0.001775 0.001775 0.001775 0.001775
##   [8] 0.001775 0.001775 0.001775 0.001775 0.001775 0.001775 0.001775
##  [15] 0.001775 0.001775 0.001775 0.001775 0.001775 0.001775 0.001775
##  [22] 0.001775 0.001775 0.001775 0.001775 0.001775 0.001775 0.001775
##  [29] 0.002130 0.002130 0.002455 0.002905 0.003075 0.003075 0.003075
##  [36] 0.003075 0.003915 0.003915 0.004130 0.004425 0.005665 0.006110
##  [43] 0.006110 0.006110 0.006110 0.006755 0.007335 0.007335 0.008070
##  [50] 0.008620 0.008620 0.008620 0.008705 0.009600 0.009600 0.009965
##  [57] 0.009965 0.010180 0.010760 0.010760 0.010960 0.011425 0.011710
##  [64] 0.011710 0.011710 0.011710 0.011710 0.011730 0.011730 0.011730
##  [71] 0.011730 0.011730 0.011730 0.011730 0.011730 0.011730 0.011730
##  [78] 0.011730 0.011730 0.011730 0.011730 0.011730 0.011730 0.011730
##  [85] 0.011730 0.011730 0.011730 0.011730 0.011730 0.011730 0.011730
##  [92] 0.011730 0.011730 0.011730 0.011730 0.011730 0.011730 0.011730
##  [99] 0.011730 0.011730 0.011730 0.011730 0.011730 0.011730 0.011730
## [106] 0.012285 0.012715 0.012715 0.012715 0.013115 0.013595 0.013595
## [113] 0.013595 0.013595 0.014155 0.014155 0.015260 0.015260 0.015260
## [120] 0.015920 0.015920 0.016475 0.016525 0.017140 0.017745 0.017770
## [127] 0.017960 0.020010 0.020010 0.021625 0.022060 0.022825 0.024115
## [134] 0.024115 0.024880 0.026015 0.026810 0.028665 0.029260 0.030450
## [141] 0.032190 0.033150 0.035670 0.036195 0.036965 0.039350 0.040415
## [148] 0.043070 0.045155 0.047540 0.049385 0.051050 0.053895 0.055530
## [155] 0.059450 0.062060 0.063435 0.067690 0.070245 0.074775 0.077490
## [162] 0.081165 0.085065 0.087790 0.091585 0.093825 0.097440 0.098790
## [169] 0.100930 0.102050 0.103465 0.104045 0.104365 0.104365 0.104365
## [176] 0.104685 0.104790 0.105600 0.106440 0.106955 0.110315 0.110770
## [183] 0.112910 0.115915 0.118435 0.121025 0.123985 0.125780 0.130075
## [190] 0.133555 0.137650 0.140940 0.144495 0.148200 0.151965 0.155925
## [197] 0.158945 0.162905 0.166445 0.171035 0.174575 0.178850 0.182915
## [204] 0.187285 0.190255 0.193640 0.197410 0.200880 0.205265 0.208270
## [211] 0.211790 0.214270 0.218280 0.221310 0.223780 0.226750 0.230470
## [218] 0.232465 0.235010 0.237955 0.240400 0.242260 0.244740 0.246720
## [225] 0.249250 0.250425 0.252250 0.254620 0.257245 0.258420 0.259765
## [232] 0.261755 0.264285 0.265980 0.267145 0.269595 0.271065 0.272955
## [239] 0.275145 0.275930 0.278135 0.280770 0.281985 0.284265 0.285580
## [246] 0.287830 0.289925 0.291645 0.293095 0.294665 0.296325 0.298505
## [253] 0.300040 0.300040 0.301305 0.302455 0.302455 0.304025 0.304135
## [260] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [267] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [274] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
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## [281] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [288] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [295] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [302] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [309] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [316] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [323] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [330] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [337] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [344] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [351] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [358] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [365] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [372] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [379] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [386] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [393] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [400] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [407] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [414] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [421] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [428] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [435] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [442] 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135 0.304135
## [449] 0.304135 0.304135
```