Lab Assignment 3

1. R Project

Prepare a dataset related to your own project and perform k-Means, k-Medians, Expectation Maximisation (EM), Hierarchical Clustering and report the results.

Description:

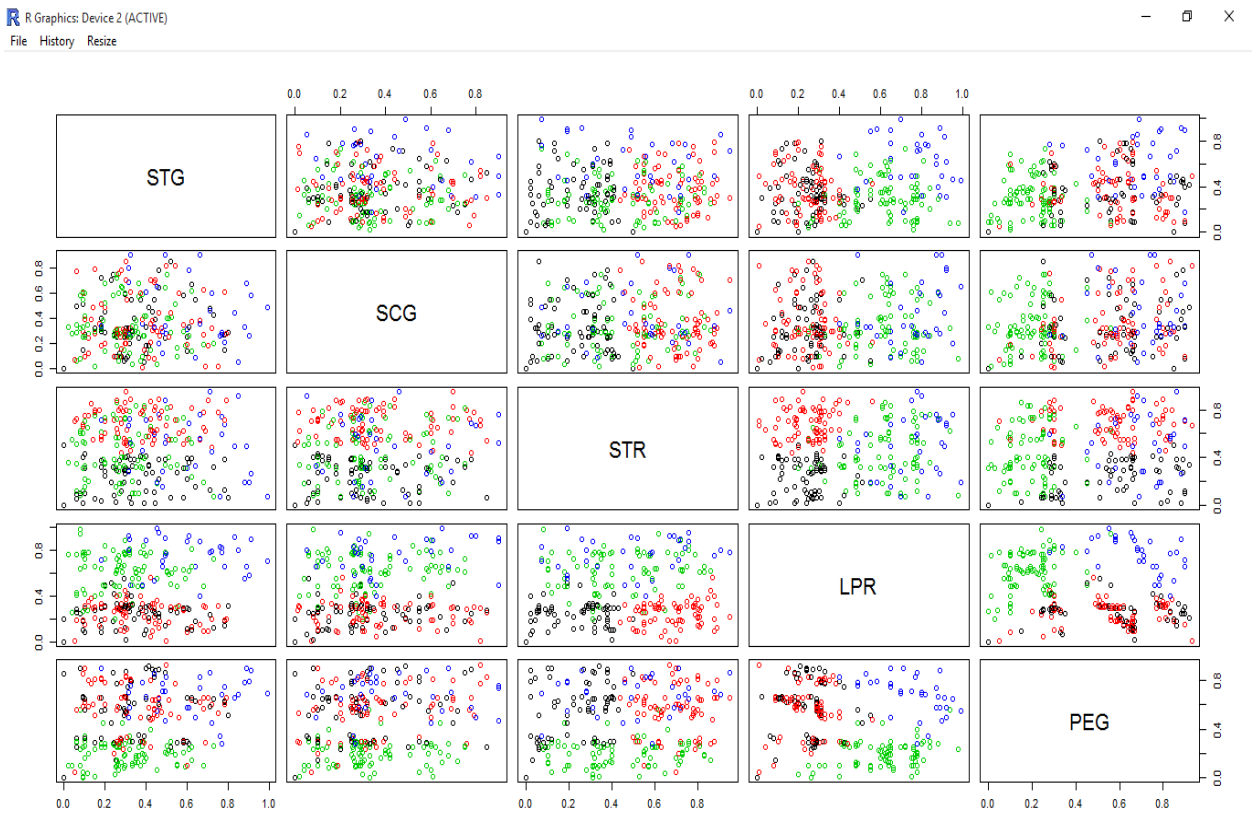
Data Set Characteristics: Multivariate
Number of Instances: 403
Area: Education
Attribute Characteristics: Real
Number of Attributes: 5
Associated Tasks: Clustering

Class Distribution
Very Low: 50
Low:129
Middle: 122
high 130
Total:403

Attribute Information:
STG (The degree of study time for goal object materails),
SCG (The degree of repetition number of user for goal object materails)
STR (The degree of study time of user for related objects with goal object)
LPR (The exam performance of user for related objects with goal object)
PEG (The exam performance of user for goal objects)
UNS (The knowledge level of user)

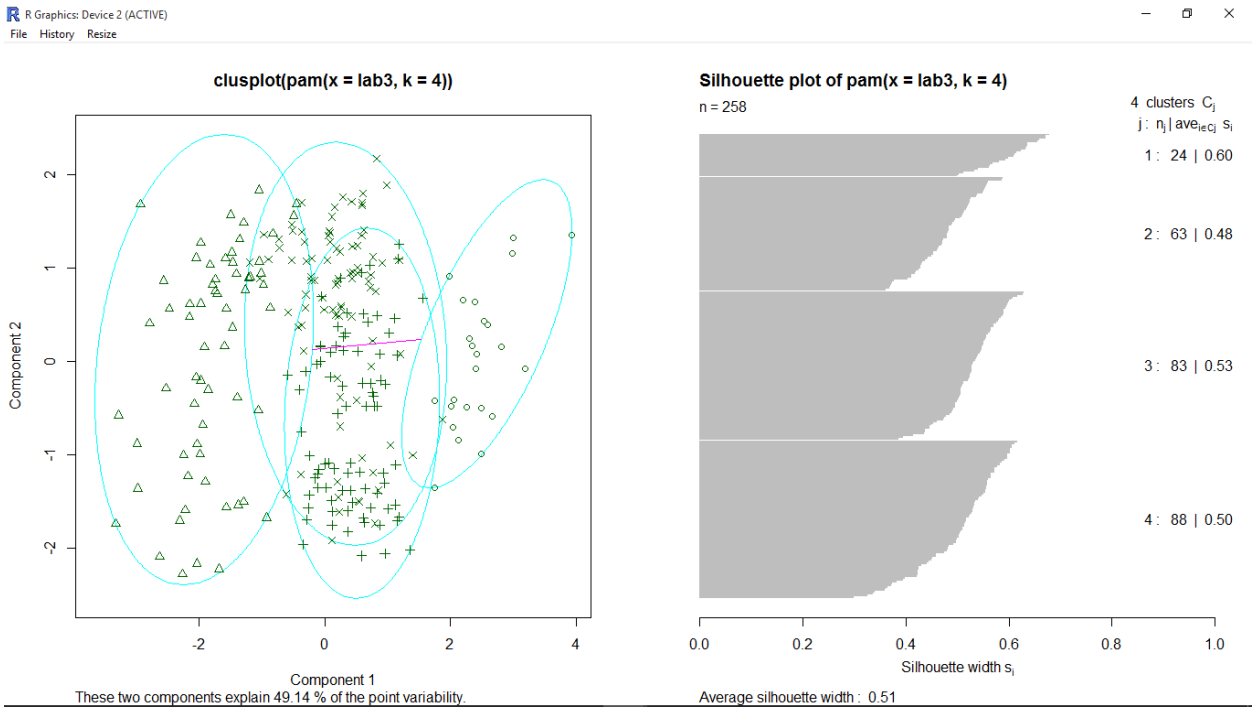
K-Means

```
lab3<-read.csv("lab3.csv")

Lab3<-lab3

Lab3$UNS<-NULL

km<-kmeans(Lab3,4,41)

table(lab3$UNS,km$cluster)

plot(Lab3[c("STG","SCG","STR","LPR","PEG")],col=km$cluster)
```



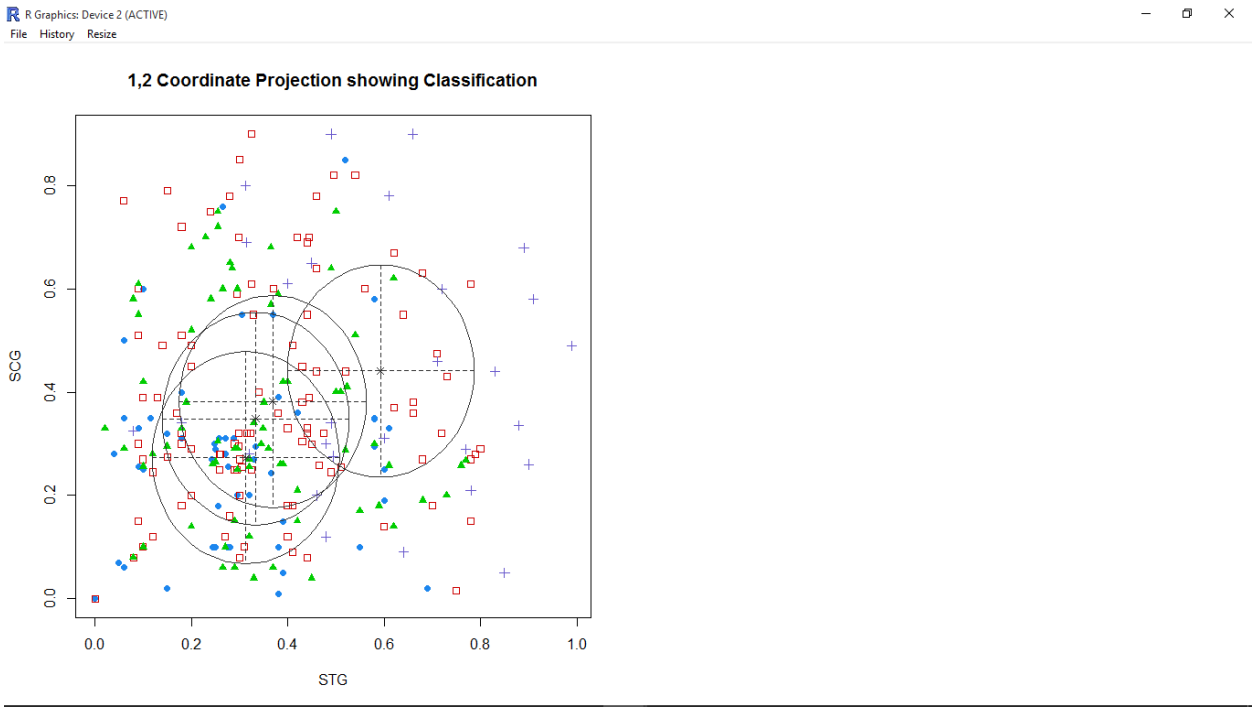
K-medoids

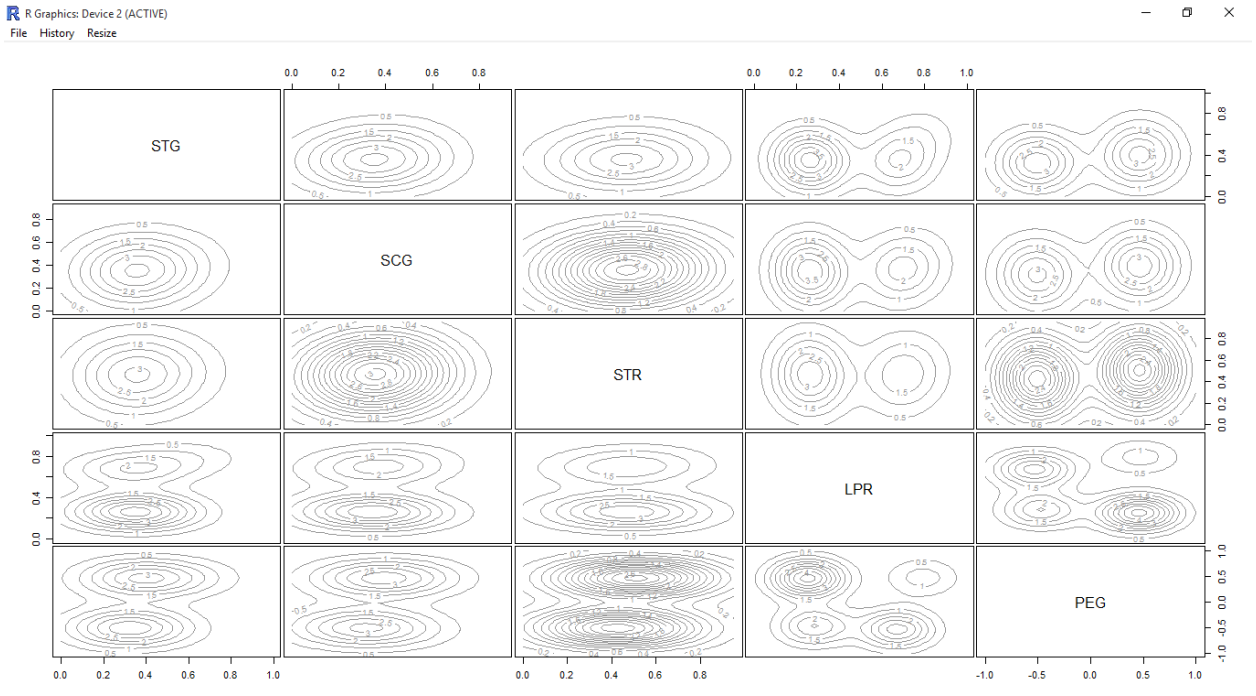
```
library(cluster)

lab3<-read.csv('lab3.csv')

pam.result<-pam(lab3,4)

table(pam.result$clustering,lab3$UNS)

layout(matrix(c(1,2),1,2))

plot(pam.result)
```



Expectation Maximization

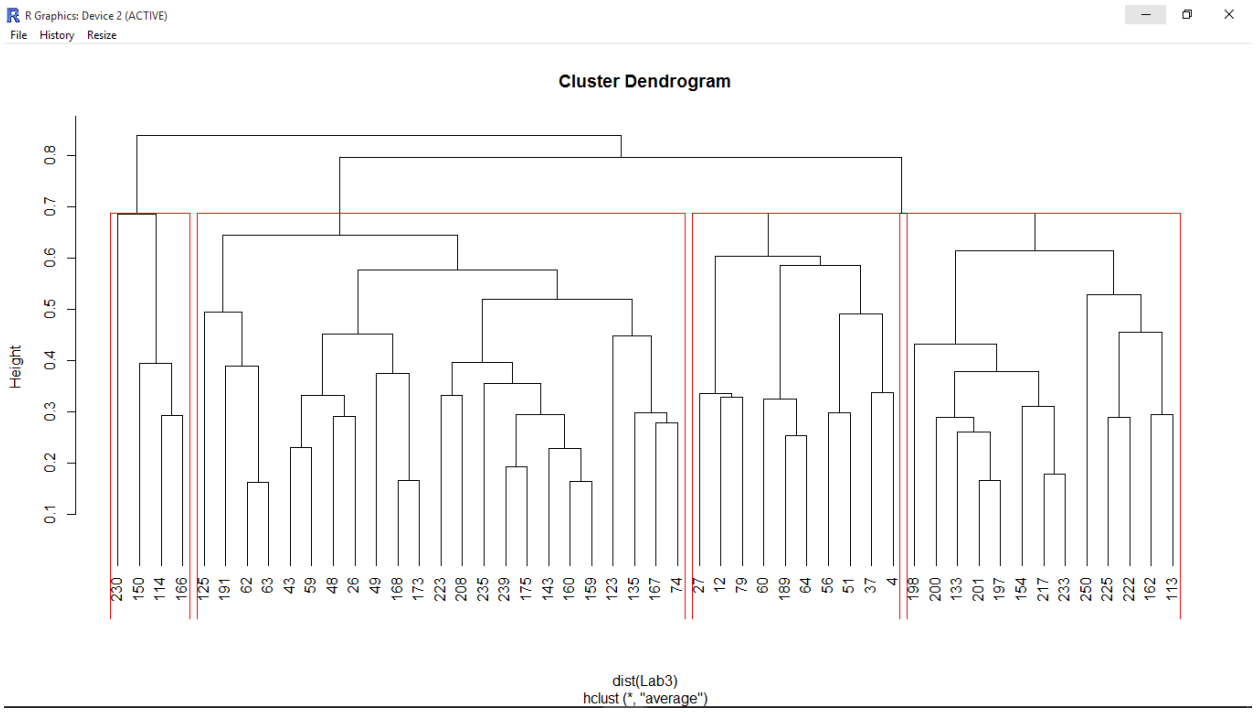
```
library(mclust)

lab3<-read.csv('lab3.csv')

mc<-Mclust(lab3[,1:5],4)

summary(mc)

plot(mc,what="density",dimens=c(1,2))

plot(mc,what="classification",dimens=c(1,2))

table(lab3$UNS,mc$classification)
```


R Graphics: Device 2 (ACTIVE)
File History Resize
1,2 Coordinate Projection showing Classification
SCG
STG
0.0
0.2
0.4
0.6
0.8
1.0


R Graphics: Device 2 (ACTIVE)
File History Resize
STG
SCG
STR
LPR
PEG

Hierarchical Clustering

```
lab3<-read.csv("lab3.csv")

idx<-sample(1:dim(lab3)[1],50)

Lab3<-lab3[idx,]

Lab3$UNS<-NULL

hc<-hclust(dist(Lab3),method="ave")

plot(hc,hang=-1,labels=Lab3$UNS)

rect.hclust(hc,k=4)

groups<-cutree(hc,k=4)
```

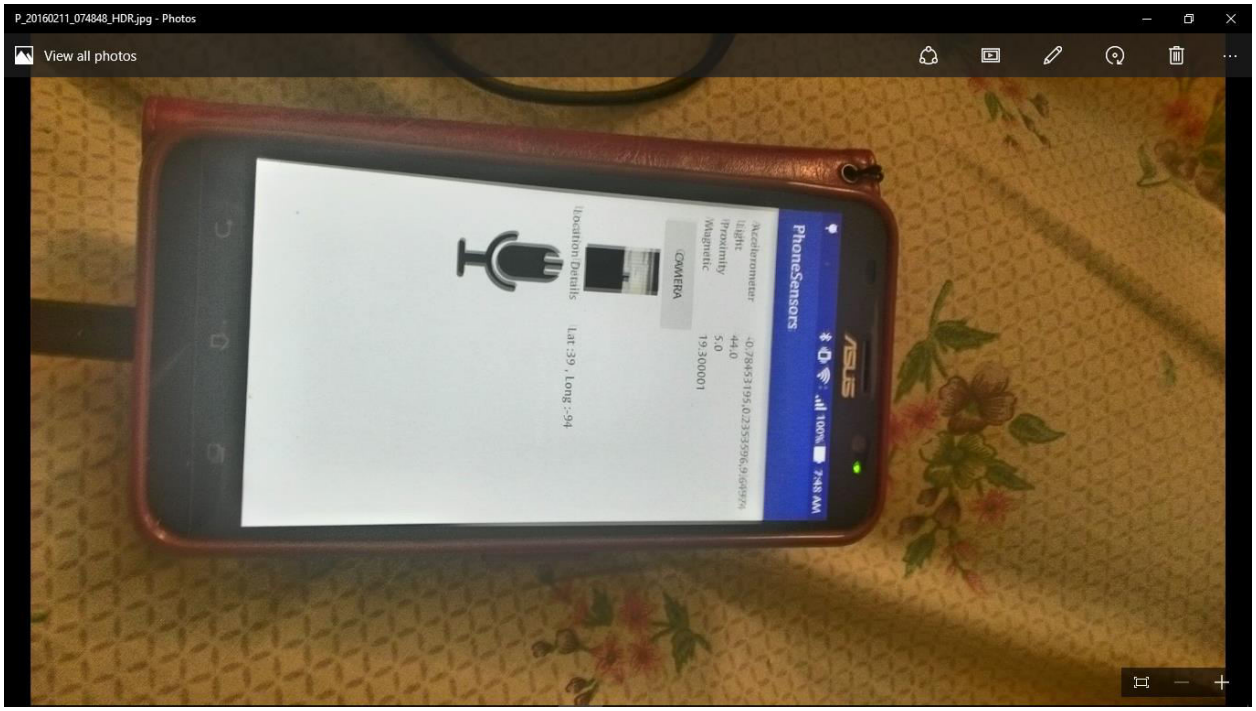


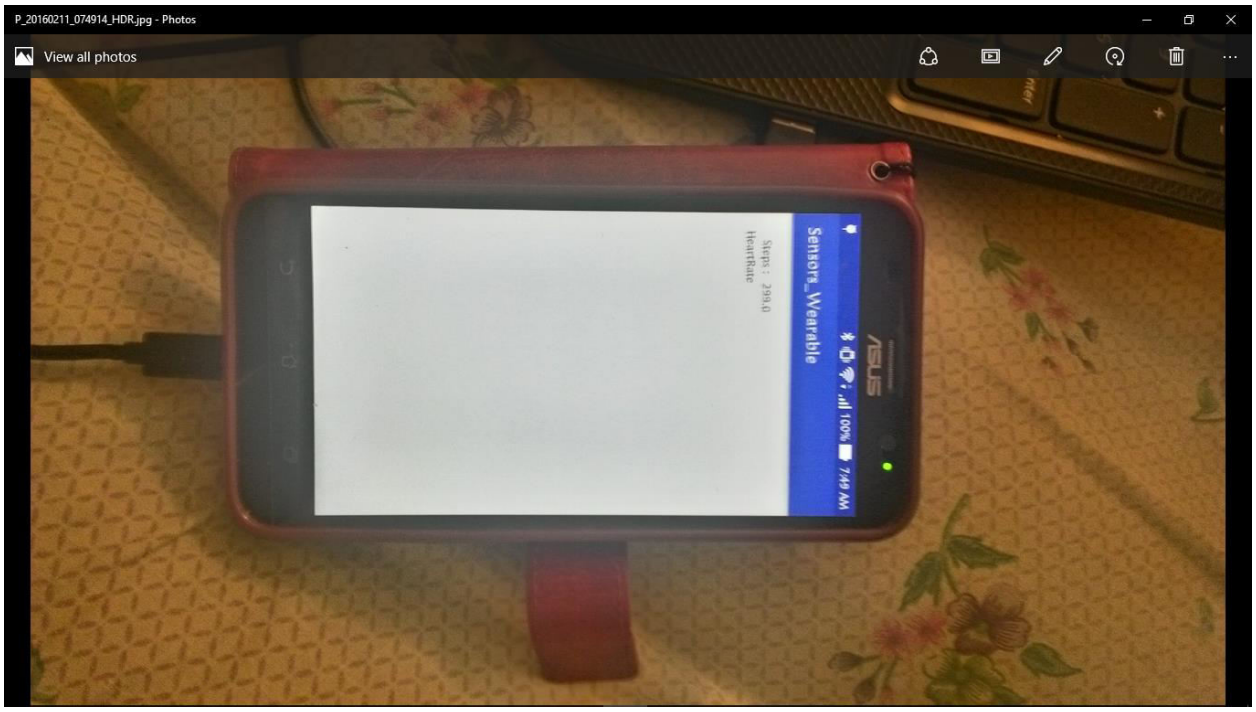
2. Watch Application

Data collection related to your own project through Smart Phone and Watch, send notifications to watch using intuitive data analysis.

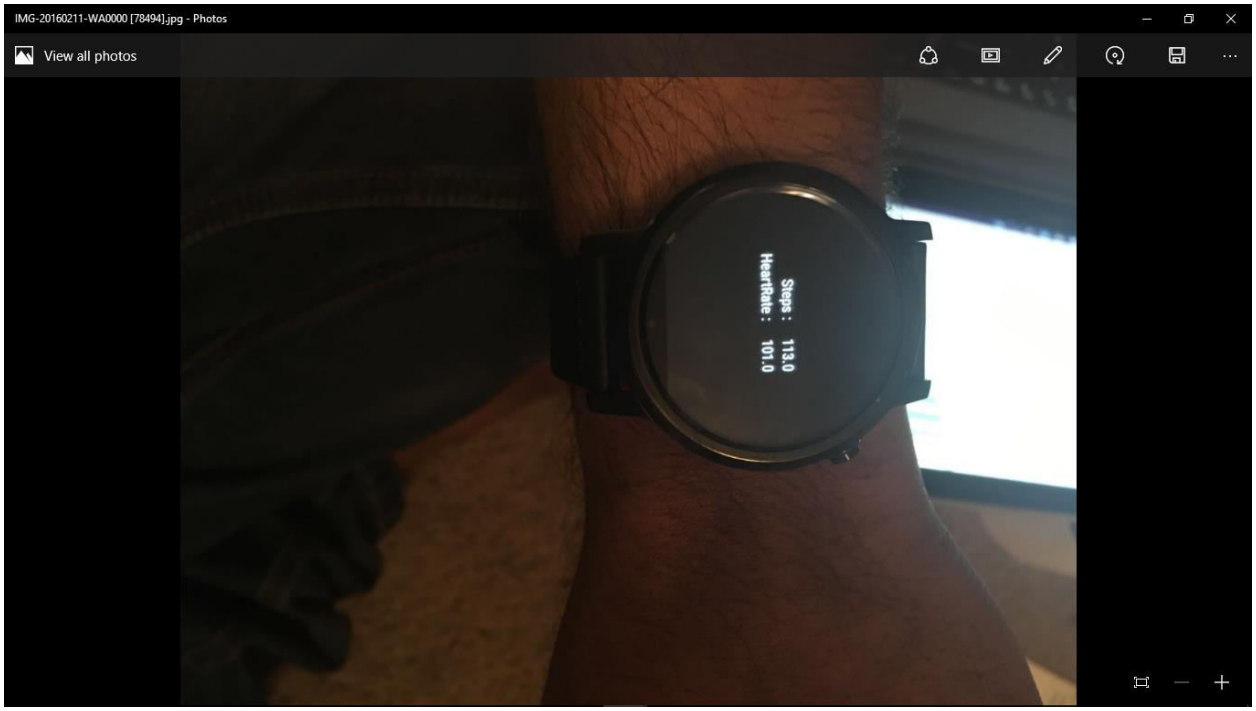
Description: The data is collected through smart phone and is sent as notification to smart watch.

Screen shots:





Class id-22


IMG-20160211-WA0000 [78494].jpg - Photos
View all photos
Steps : 113.0
HeartRate : 101.0