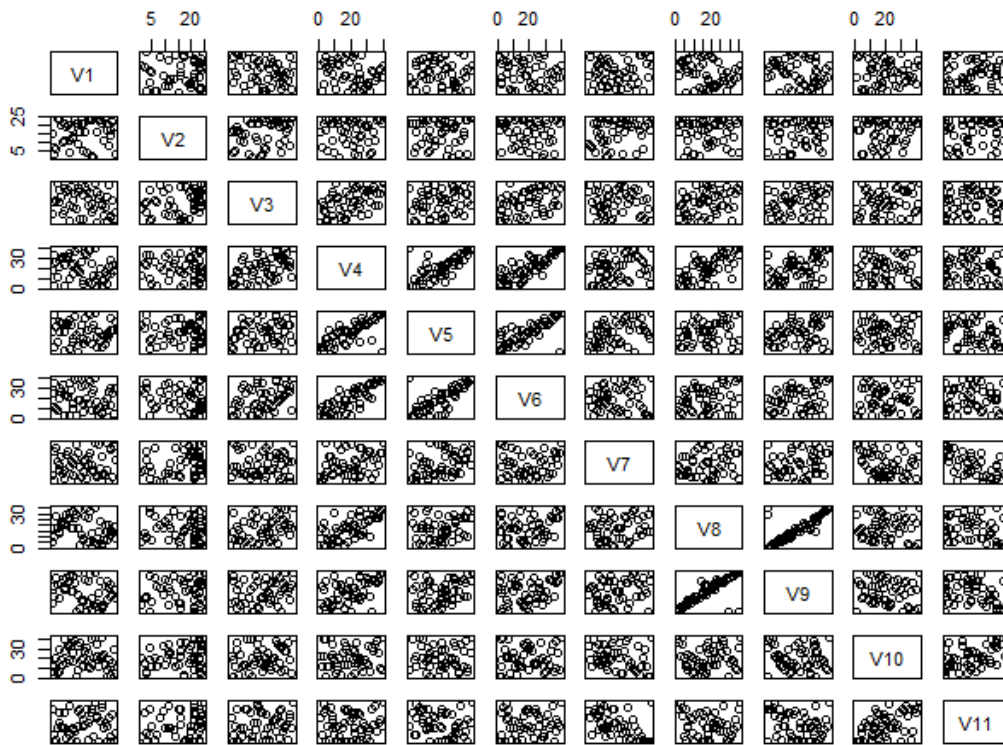


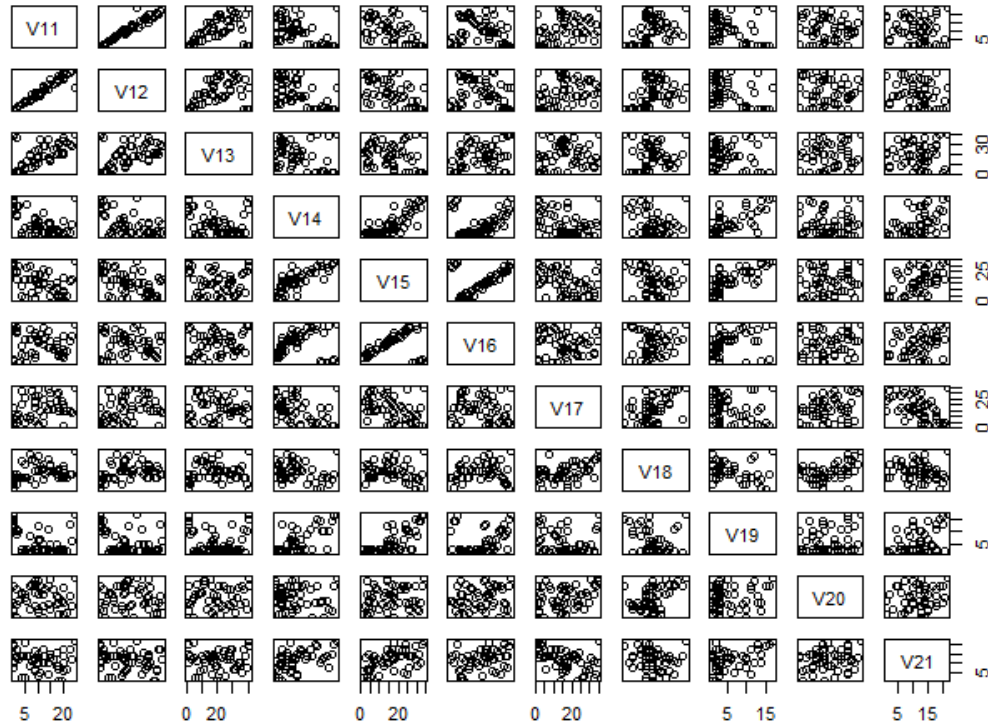
Khan Inan

```
> plot(ppg2008)
> plot.default(ppg2008)
> plot.xy(ppg2008)
```

in addition with stat analysis and regression analysis







2.

```
> as.matrix(data.frame(train))
      v1      v2      v3      v4      v5      v6      v7      v8      v9      v10     v11     v12
[1,] "label" "pixel0" "pixel1" "pixel2" "pixel3" "pixel4" "pixel5" "pixel6" "pixel7" "pixel8" "pixel9" "pixel10"
      v13      v14      v15      v16      v17      v18      v19      v20      v21      v22      v23
[1,] "pixel11" "pixel12" "pixel13" "pixel14" "pixel15" "pixel16" "pixel17" "pixel18" "pixel19" "pixel20" "pixel21"
      v24      v25      v26      v27      v28      v29      v30      v31      v32      v33      v34
[1,] "pixel22" "pixel23" "pixel24" "pixel25" "pixel26" "pixel27" "pixel28" "pixel29" "pixel30" "pixel31" "pixel32"
      v35      v36      v37      v38      v39      v40      v41      v42      v43      v44      v45
[1,] "pixel33" "pixel34" "pixel35" "pixel36" "pixel37" "pixel38" "pixel39" "pixel40" "pixel41" "pixel42" "pixel43"
      v46      v47      v48      v49      v50      v51      v52      v53      v54      v55      v56
[1,] "pixel44" "pixel45" "pixel46" "pixel47" "pixel48" "pixel49" "pixel50" "pixel51" "pixel52" "pixel53" "pixel54"
      v57      v58      v59      v60      v61      v62      v63      v64      v65      v66      v67
[1,] "pixel55" "pixel56" "pixel57" "pixel58" "pixel59" "pixel60" "pixel61" "pixel62" "pixel63" "pixel64" "pixel65"
      v68      v69      v70      v71      v72      v73      v74      v75      v76      v77      v78
[1,] "pixel66" "pixel67" "pixel68" "pixel69" "pixel70" "pixel71" "pixel72" "pixel73" "pixel74" "pixel75" "pixel76"
      v79      v80      v81      v82      v83      v84      v85      v86      v87      v88      v89
[1,] "pixel77" "pixel78" "pixel79" "pixel80" "pixel81" "pixel82" "pixel83" "pixel84" "pixel85" "pixel86" "pixel87"
      v90      v91      v92      v93      v94      v95      v96      v97      v98      v99      v100
[1,] "pixel88" "pixel89" "pixel90" "pixel91" "pixel92" "pixel93" "pixel94" "pixel95" "pixel96" "pixel97" "pixel98"
      v101     v102     v103     v104     v105     v106     v107     v108     v109     v110
[1,] "pixel99" "pixel100" "pixel101" "pixel102" "pixel103" "pixel104" "pixel105" "pixel106" "pixel107" "pixel108"
      v111     v112     v113     v114     v115     v116     v117     v118     v119     v120
```

the creation of the matrix and aligned pixels is shown above

```

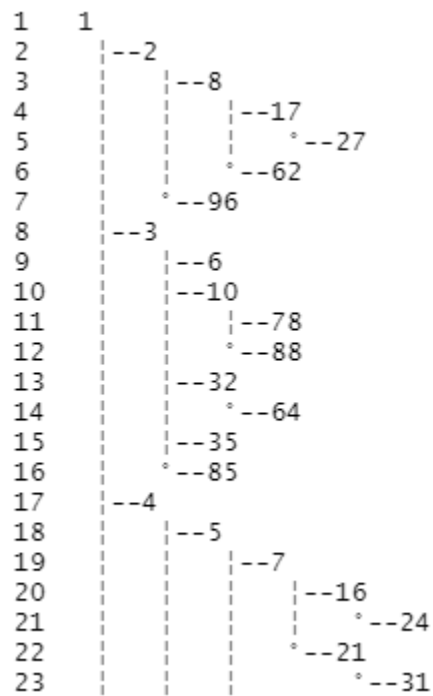
# Libraries
library(ggraph)
library(igraph)
library(tidyverse)

# create an edge list data frame giving the
d1 <- data.frame(from="origin", to=paste("n", 1:23))
d2 <- data.frame(from=rep(d1$to, each=5), to=paste("n", 1:23))
edges <- rbind(d1, d2)

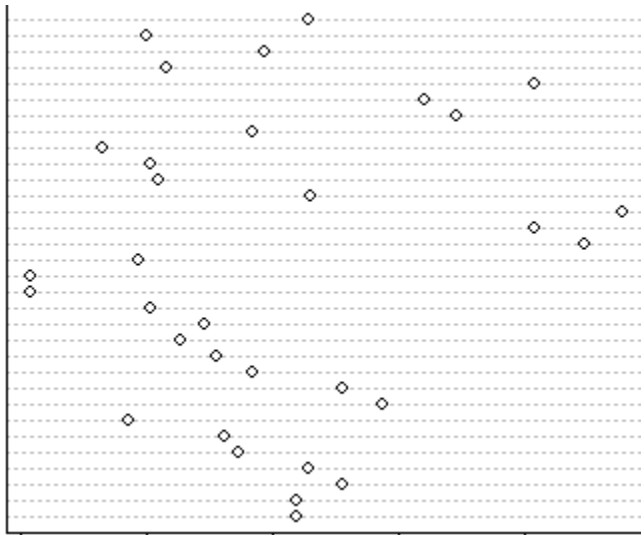
# Create a graph object
mygraph <- graph_from_data_frame( edges )

# Basic tree
ggraph(mygraph, layout = 'dendrogram', circular = TRUE) +
  geom_edge_diagonal() +
  geom_node_point() +
  theme_void()

```



using the dotchart function, from combining the average of pixels from the test set, this is the graph I obtained



Using the heatmap() function and the mnemiopsis data

