report_executed

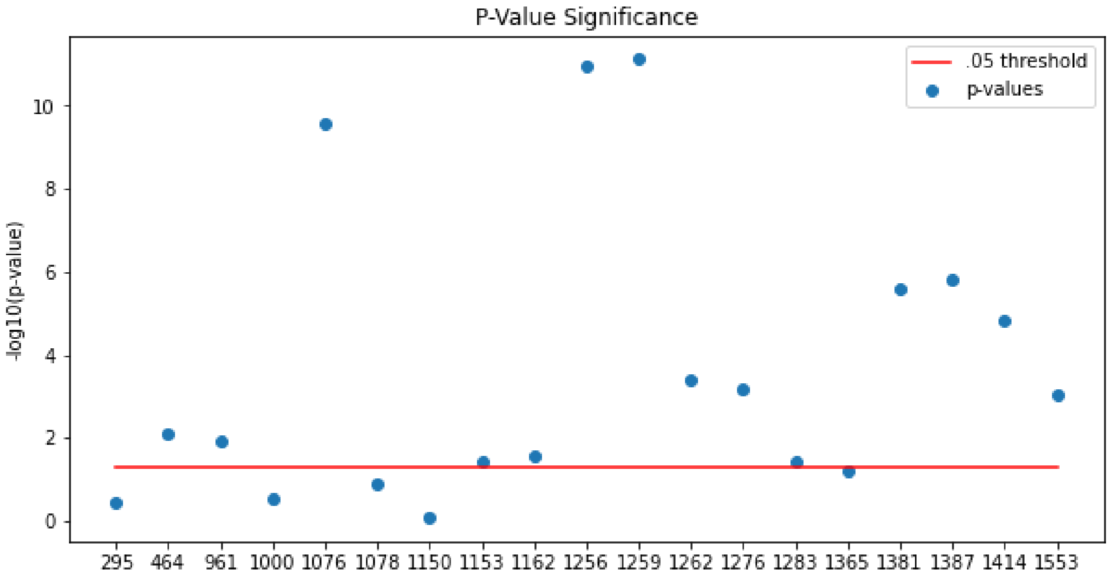
June 28, 2021

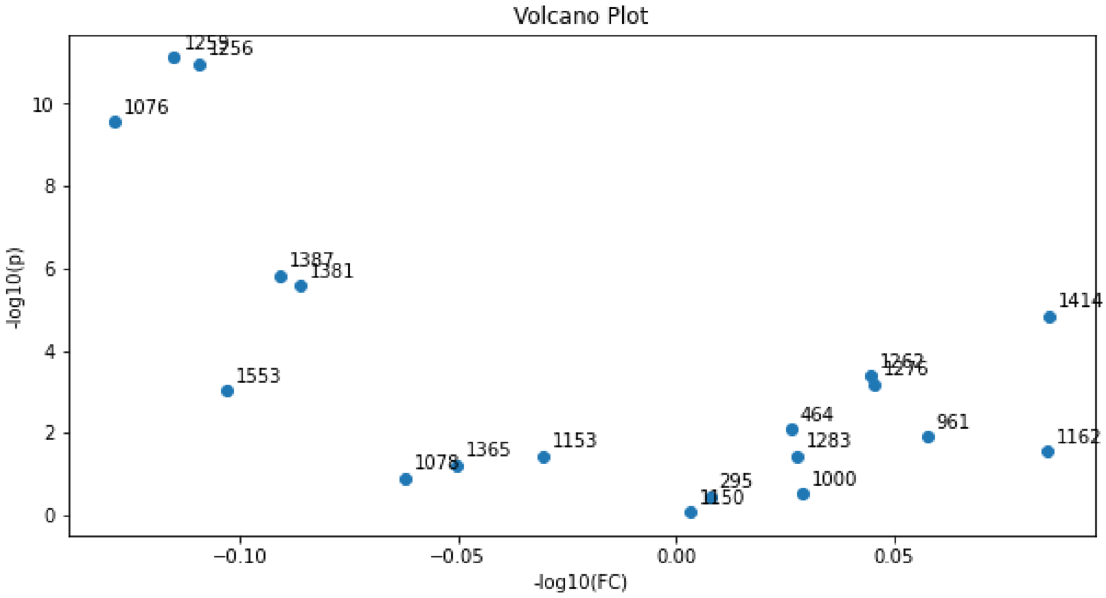
1 ADAP-ML Report

T-test and volcano plot

[1]:

```python
import adapml_data
import adapml_classification
import adapml_chemometrics
import adapml_statistics
import numpy as np
import loadTestData as load_data
import sklearn.preprocessing as pre
from sklearn.cross_decomposition import PLSRegression as PLS
from matplotlib import pyplot as plt
import os


reldir = os.getcwd()
path_to_data = os.path.join(reldir, '..', 'data', 'SCLC_study_output_filtered_2.
 ↪csv')
path_to_resp = os.path.join(reldir, '..', 'data', 'SCLC_study_responses_2.csv')

data = adapml_data.DataImport(path_to_data)
response1D = adapml_data.DataImport.getResponse(path_to_resp)
response2D = adapml_data.DataImport.getDummyResponse(response1D)

variables = data.getVariableNames()
samples = data.getSampleNames()

t_test = adapml_statistics.Statistics(data.data, 'anova', response1D)
t_test.plot_logp_values(variables)
t_test.plot_volcano_t(variables)
```





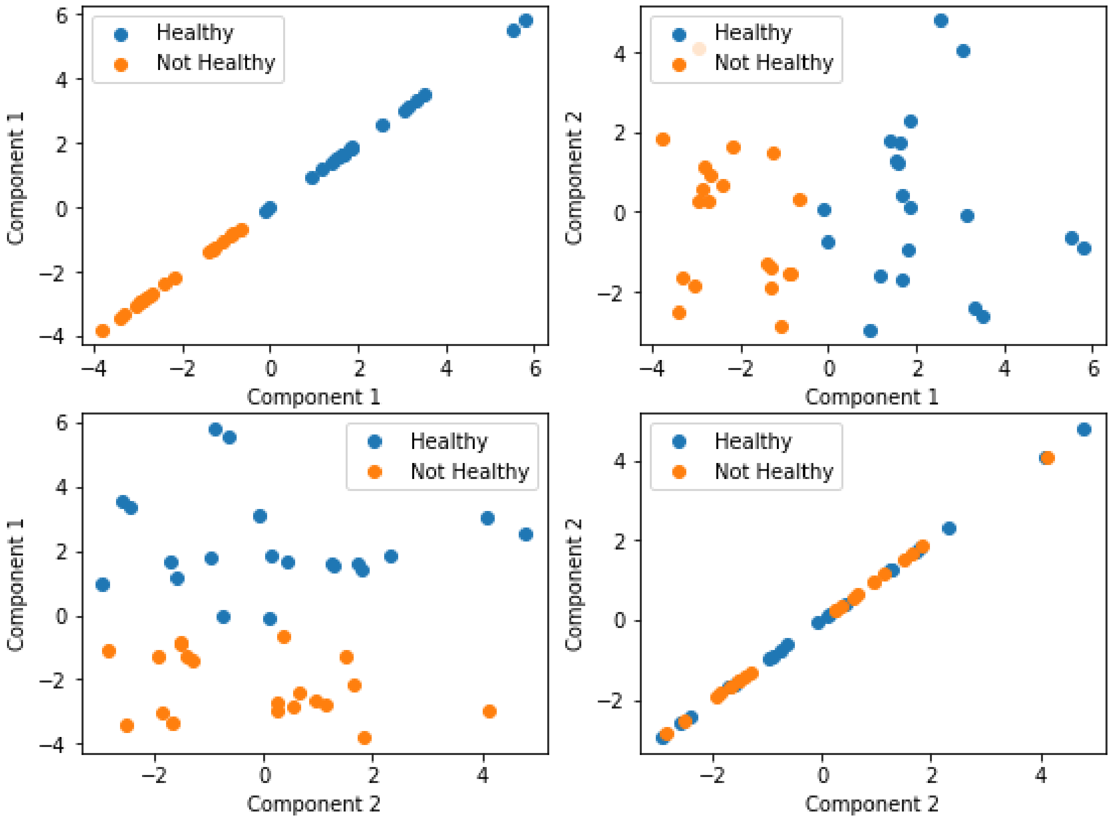
2 PCA

blabla

[2]:
```
data.normalizeData("autoscale")

pca = adapml_chemometrics.Chemometrics(data.data, "pca", response1D)
```

```
print("PCA Projections");pca.plotProjectionScatterMultiClass(2,␣
 ↪labels=["Healthy", "Not Healthy"])
```

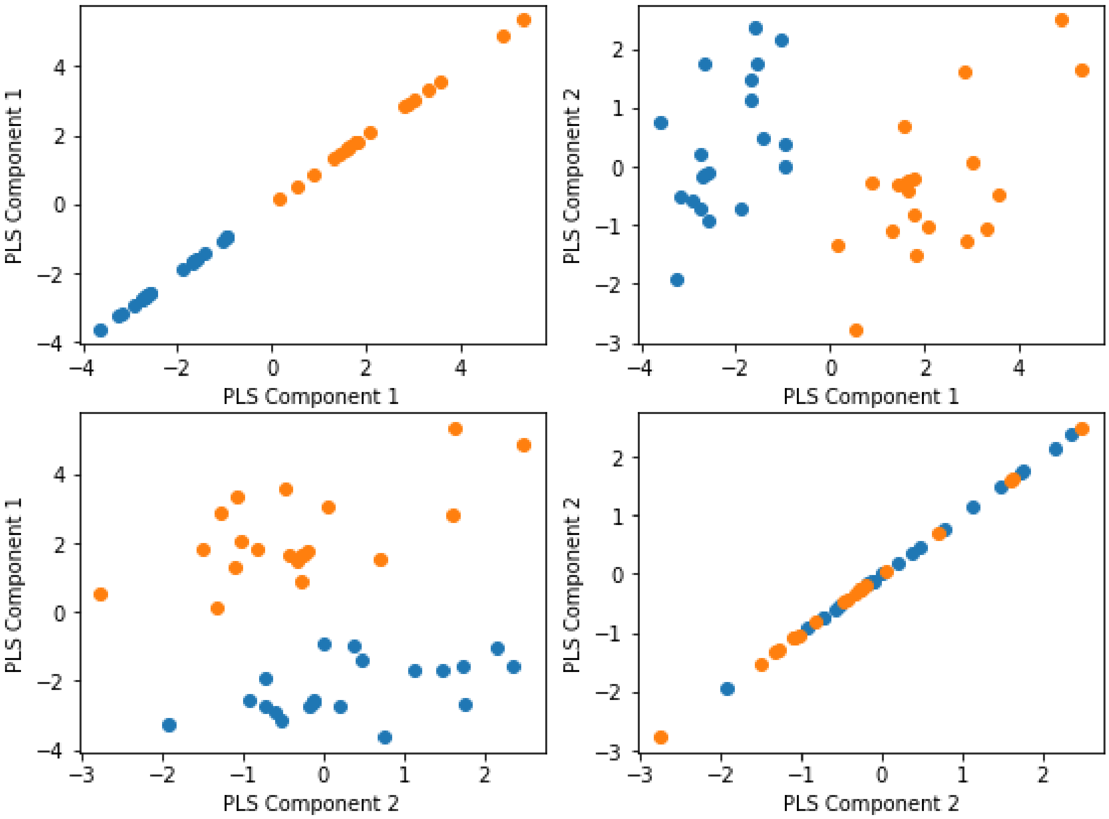
```
PCA Projections
Projections of data into latent space.
Data is colored by response
```



3 PLS-DA

```
[3]: def plotProjectionScatterMultiClass(pc, resp, num_var):
         plt.figure(figsize=(24, 18))

         for i in range(num_var):
             for j in range(num_var):
                 plt.subplot(5,5,5*(i) + j + 1)
                 for c in range(resp.shape[1]):
                     inx = np.where(resp[:,c] == 1)[0]
                     tmp = pc[inx,:]
                     pc1 = tmp[:,i]
```

```
                pc2 = tmp[:,j]
                plt.scatter(pc1, pc2)
            plt.xlabel("PLS Component "+str(i+1))
            plt.ylabel("PLS Component "+str(j+1))

    plt.show()

data = load_data.loadDataPandas(path_to_data)
d = data.to_numpy()
var_index = data.columns.values.tolist()

resp = load_data.getResponseMatrix2D()

norm_trans = pre.StandardScaler().fit(d)
data_norm = norm_trans.transform(d)
#data_norm, norm_trans = pre.mean_center(d)
#In-built preprocessing method - TBD

pls = PLS().fit(data_norm, resp)
pls_trans = pls.transform(data_norm)

plotProjectionScatterMultiClass(pls_trans, resp, 2)
```


PLS Component 1
PLS Component 1
PLS Component 2
PLS Component 1
PLS Component 1
PLS Component 2
PLS Component 2
PLS Component 2