Program running results

# Programs

## Program set

Featuregen.py

Sampling6.py

Image\_feature\_generation6.py

Method\_compare6.py

Train\_RF61.py

Test\_RF62.py

Demo\_test\_RF61.py

The programs are modified by generated correspond data file name and path from the name of the plant. The name of the plant will be required to input during the running of the program. Also, different to Test\_RF61.py, the features of the test data set are generated using Image\_feature\_generation6.py rather than do it inside the test program, and therefore the user should run Image\_feature\_generation6.py, one is for the train set and another for test set. The Image\_feature\_generation6.py will ask user to specify train or test feature they want to generate. By this modification, users can test any plant/crop disease dataset without modifying codes. They just need to input plant/crop names as required when programs running.

To facilitate the new version of the program, the sample data files must exactly organized as follows:

1. Using class name as the subfold name of the sample files of this class;
2. Using plant/crop name as the plant/crop’s sample data fold;
3. No other file and subfold in this folds
4. The fold must be under the same fold of the codes ( here is the /EPQ)

## Running procedure

Run Sampling6.py to split samples to train set and test set;

Run Image\_feature\_generation6.py (input train) to generate train sample features;

Run Image\_feature\_generation6.py (input test) to generate test sample features;

Run Method\_compare6.py to compare 7 methods by 10 fold cross validation;

Run Train\_RF61.py to train RF classifier and scaler;

Run Test\_RF62py to test the trained classifier and scale with test set.

## Data set

There are 5 plants in the data set with various diseases as follows:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Apple | Corn | Grape | potato | tomato |
| healthy | 1645 | 1162 | 423 | 152 | 1591 |
| disease1 | 630 | 513 | 1180 | 1000 | 2127 |
| disease2 | 275 | 1192 | 1384 | 1000 | 1000 |
| disease3 | 621 | 985 | 1076 |  | 1909 |
| disease4 |  |  |  |  | 952 |
| disease5 |  |  |  |  | 1771 |
| disease6 |  |  |  |  | 1676 |
| disease7 |  |  |  |  | 1404 |
| disease8 |  |  |  |  | 373 |
| disease9 |  |  |  |  | 5357 |

## Data file

There are 6 data files for each plant which were generated and saved in the correspond subfolds named with the plant’s name (e.g, for corn, is output/corn/corn\_train\_samples6.h5,…, and so on):

Train\_samples6.h5 : train samples data file;

Test\_samples6.h5 : test samples data file;

Train\_features6.h5: train features data file;

Test\_features6.h5 : test features data file;

Train\_model: trained classifier file;

Train\_scaler: trained scaler file.

# Running results (test size is 0.2 for all crops)

## Corn

* + 1. Cross validation results

runfile('C:/Users/mjksshc2/Documents/David\'s code/EPQ codes/method\_compare6.py', wdir='C:/Users/mjksshc2/Documents/David\'s code/EPQ codes')

Current directory is : C:\Users\mjksshc2\Documents\David's code\EPQ codes

input plant name: corn

classnames ['healthy' 'leaf\_spot' 'Northern\_Leaf\_Blight' 'rust']

[STATUS] splitted train and test data...

Train data : (3081, 532)

Train labels: (3081,)

[0.92556634 0.93181818 0.93181818 0.91558442 0.93181818 0.89935065

0.92532468 0.93181818 0.91883117 0.94480519]

LR: 0.925674 (0.011656)

[0.90938511 0.92857143 0.92207792 0.89285714 0.91558442 0.87987013

0.90909091 0.91558442 0.92207792 0.93831169]

LDA: 0.913341 (0.016099)

[0.91909385 0.93181818 0.91883117 0.9025974 0.92532468 0.89935065

0.90909091 0.93181818 0.90909091 0.92532468]

KNN: 0.917234 (0.011086)

[0.94498382 0.92207792 0.91883117 0.91883117 0.89935065 0.90584416

0.9025974 0.93831169 0.90909091 0.94480519]

CART: 0.920472 (0.016212)

[0.96763754 0.94155844 0.95454545 0.95779221 0.94155844 0.93831169

0.94805195 0.95454545 0.96428571 0.96753247]

RF: 0.953582 (0.010389)

[0.91585761 0.8961039 0.89935065 0.88961039 0.89935065 0.86688312

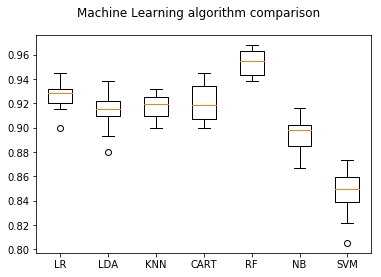
0.87337662 0.88311688 0.9025974 0.90909091]

NB: 0.893534 (0.014619)

[0.85113269 0.85714286 0.8474026 0.82142857 0.87337662 0.80519481

0.84090909 0.86038961 0.83766234 0.87012987]

SVM: 0.846477 (0.020133)



* + 1. Training, RF

runfile('C:/Users/mjksshc2/Documents/David\'s code/EPQ codes/Train\_RF61.py', wdir='C:/Users/mjksshc2/Documents/David\'s code/EPQ codes')

Current directory is : C:\Users\mjksshc2\Documents\David's code\EPQ codes

input plant name: corn

ClassNames ['healthy' 'leaf\_spot' 'Northern\_Leaf\_Blight' 'rust']

Train data : (3081, 532)

Train labels: (3081,)

Trained scaler saved in: output/corn\corn\_train\_scaler

Trained classifier saved in: output/corn\corn\_train\_model

end of the train process

* + 1. Test, RF

runfile('C:/Users/mjksshc2/Documents/David\'s code/EPQ codes/Test\_RF61.py', wdir='C:/Users/mjksshc2/Documents/David\'s code/EPQ codes')

Current directory is : C:\Users\mjksshc2\Documents\David's code\EPQ codes

input plant name: corn

test samples: 771

generate test features...

Processing and feature generation...

Image numbers of healthy data set: 250

Image numbers of leaf\_spot data set: 99

Image numbers of Northern\_Leaf\_Blight data set: 194

Image numbers of rust data set: 228

[STATUS] completed Global Feature Extraction...

ClassNames ['healthy' 'leaf\_spot' 'Northern\_Leaf\_Blight' 'rust']

Test data : (771, 532)

Test labels : (771,)

error predictions:

error for: dataset/corn\leaf\_spot/7394c8a3-7c6e-486b-a2b3-bb54d7dfba25\_\_\_RS\_GLSp 4334.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/36584bae-f3bb-40c0-b866-ed5ba0c2f7ae\_\_\_RS\_GLSp 4577.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/a7659e27-ba53-4b85-a0dd-6a1009703831\_\_\_RS\_GLSp 4619.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/eda51a46-b237-47c4-b19f-97463e2c303a\_\_\_RS\_GLSp 4618.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/bbde9366-ec3c-4354-815b-5b95b6cdb676\_\_\_RS\_GLSp 4481.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\Northern\_Leaf\_Blight/5a9feebe-b5b4-40e2-a717-1b5ea0666356\_\_\_RS\_NLB 3833.JPG

test sample type Northern\_Leaf\_Blight prediction type leaf\_spot

error for: dataset/corn\Northern\_Leaf\_Blight/ed87978b-71f0-4ab8-b1d3-e7038c0dfa16\_\_\_RS\_NLB 3494.JPG

test sample type Northern\_Leaf\_Blight prediction type leaf\_spot

error for: dataset/corn\leaf\_spot/e2199152-0f4e-44bf-8edd-4c4392494b8b\_\_\_RS\_GLSp 4578.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/e5021ce3-49e4-4b43-88e4-fdb1d98ede70\_\_\_RS\_GLSp 4695.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/d890fad9-fcde-4ed6-be88-10e61735cd9c\_\_\_RS\_GLSp 4368.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/29d60537-2717-45e1-b608-c19270302f67\_\_\_RS\_GLSp 4558.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\Northern\_Leaf\_Blight/cd2c4993-7fe9-42dc-a96e-7a8892f4b2d8\_\_\_RS\_NLB 3834 copy 2.jpg

test sample type Northern\_Leaf\_Blight prediction type leaf\_spot

error for: dataset/corn\leaf\_spot/782d68b3-4619-4a4b-865f-7071d2552500\_\_\_RS\_GLSp 4593.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/0140764c-6157-4995-9ada-9c10b81af3b8\_\_\_RS\_GLSp 4378.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/8665d5b5-d53d-4501-a6bb-011e6ee1ed61\_\_\_RS\_GLSp 4651 copy 2.jpg

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/d4c4842e-417a-4cc9-8fd5-40c618ddf483\_\_\_RS\_GLSp 4290.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\Northern\_Leaf\_Blight/6f25e428-12b2-43ab-ad91-6e20df3c35af\_\_\_RS\_NLB 3899.JPG

test sample type Northern\_Leaf\_Blight prediction type leaf\_spot

error for: dataset/corn\leaf\_spot/4be4a686-ab64-43d7-9d7c-0939e389aac9\_\_\_RS\_GLSp 9338.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/7532276c-6dcc-4c1b-9597-14a40d0414dd\_\_\_RS\_GLSp 4606.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\Northern\_Leaf\_Blight/db19f539-05e8-4cd8-a9bc-57fb97ce0f41\_\_\_RS\_NLB 4443 copy.jpg

test sample type Northern\_Leaf\_Blight prediction type leaf\_spot

error for: dataset/corn\Northern\_Leaf\_Blight/369b969a-f820-40ec-a43c-7500df90e6d1\_\_\_RS\_NLB 3615.JPG

test sample type Northern\_Leaf\_Blight prediction type leaf\_spot

error for: dataset/corn\leaf\_spot/23ee1be9-789c-4499-be4b-f99c241ada2d\_\_\_RS\_GLSp 4633.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/acd57276-c222-4f47-b9df-c0728aad7183\_\_\_RS\_GLSp 9281.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/7a4c407a-5c68-4738-b084-f859cc0b980c\_\_\_RS\_GLSp 4586.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/509b6810-db94-46ea-be98-0208c5874a1c\_\_\_RS\_GLSp 4494.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/d703fb4d-1b5e-4fde-8cb9-d639a884e3ee\_\_\_RS\_GLSp 4401.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/186c5f5d-a8d7-40bf-abe7-cebefa66808c\_\_\_RS\_GLSp 4355 copy 2.jpg

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/b62826b2-1547-4c3d-bb4f-4ebc2e166b9c\_\_\_RS\_GLSp 4651 copy.jpg

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/c8769ca7-614a-4763-a8bc-8d7c7f1b2925\_\_\_RS\_GLSp 4355.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/629273b6-9eaa-4084-b72b-ac856a9ef899\_\_\_RS\_GLSp 4636.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/573ad2a6-906a-4d32-af81-0026fc57258f\_\_\_RS\_GLSp 4613.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/ad47f4e8-308f-4c56-b50b-19e4f7fedd6d\_\_\_RS\_GLSp 4583.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/b3a3ae35-860d-4d65-af43-faa13c3d2834\_\_\_RS\_GLSp 9272.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/48beb71e-555f-4510-9951-a57f7edce204\_\_\_RS\_GLSp 9334.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/89a78c7f-dac6-426f-a0ad-397ce80e7a29\_\_\_RS\_GLSp 4289 copy 2.jpg

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/ee4db8d4-db61-49b3-85d9-bb8f52518815\_\_\_RS\_GLSp 4687.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/fd1e7be2-d635-4d70-85ac-f5d68ce7c2d1\_\_\_RS\_GLSp 4450 copy.jpg

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/c98f6b90-ac72-4ea0-99d1-dfe5ff4d791a\_\_\_RS\_GLSp 4447 copy.jpg

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/719de1a2-172b-44fd-855c-6fa8df27e5bf\_\_\_RS\_GLSp 4652 copy.jpg

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

error for: dataset/corn\leaf\_spot/ee8c711f-3aa3-45b8-95e4-c63f86929ab1\_\_\_RS\_GLSp 4444.JPG

test sample type leaf\_spot prediction type Northern\_Leaf\_Blight

total test sample: 771

correctpredictions predictions are: 731

ClassNames ['healthy' 'leaf\_spot' 'Northern\_Leaf\_Blight' 'rust']

labelclasses: [0 1 2 3]

totalsample: [250 99 194 228]

Real\_Positive: [1. 0.91549296 0.84684685 1. ]

Real\_Negative: [1. 0.95142857 0.98907104 1. ]

False\_Positive: [0. 0.08450704 0.15315315 0. ]

False\_Negative: [0. 0.04857143 0.01092896 0. ]

result metrix, row is real type, column is prediction type:

[[250 0 0 0]

[ 0 65 34 0]

[ 0 6 188 0]

[ 0 0 0 228]]

clf scores: 0.9481193255512321

## Potato:

* + 1. Cross validation

runfile('C:/Users/mjksshc2/Documents/David\'s code/EPQ codes/method\_compare6.py', wdir='C:/Users/mjksshc2/Documents/David\'s code/EPQ codes')

Current directory is : C:\Users\mjksshc2\Documents\David's code\EPQ codes

input plant name: potato

classnames ['Early\_blight' 'Healthy' 'Late\_blight']

[STATUS] splitted train and test data...

Train data : (1721, 532)

Train labels: (1721,)

[0.96531792 0.99418605 0.98837209 0.95930233 0.97674419 0.94767442

0.98255814 0.96511628 0.97674419 0.97093023]

LR: 0.972695 (0.013259)

[0.95375723 0.97674419 0.97674419 0.94186047 0.93604651 0.94767442

0.98837209 0.94186047 0.96511628 0.94186047]

LDA: 0.957004 (0.017475)

[0.97109827 1. 0.97674419 0.95348837 0.97674419 0.97674419

0.99418605 0.97093023 0.97674419 0.97093023]

KNN: 0.976761 (0.012188)

[0.95375723 0.98255814 0.96511628 0.97674419 0.94767442 0.93604651

0.96511628 0.96511628 0.93023256 0.95348837]

CART: 0.957585 (0.015820)

[0.98265896 1. 0.99418605 0.97093023 0.98255814 0.96511628

0.98255814 0.98255814 0.97093023 0.98255814]

RF: 0.981405 (0.010004)

[0.91907514 0.87209302 0.87790698 0.88372093 0.88372093 0.84883721

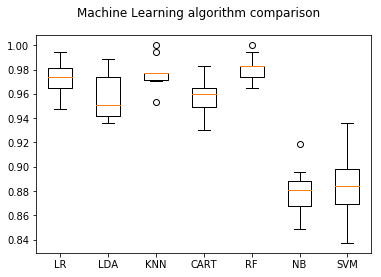
0.89534884 0.86046512 0.86627907 0.88953488]

NB: 0.879698 (0.018676)

[0.90751445 0.93604651 0.90116279 0.88953488 0.84883721 0.87790698

0.88372093 0.8372093 0.88372093 0.86627907]

SVM: 0.883193 (0.027125)



* + 1. Training, RF

runfile('C:/Users/mjksshc2/Documents/David\'s code/EPQ codes/Train\_RF61.py', wdir='C:/Users/mjksshc2/Documents/David\'s code/EPQ codes')

Current directory is : C:\Users\mjksshc2\Documents\David's code\EPQ codes

input plant name: potato

ClassNames ['Early\_blight' 'Healthy' 'Late\_blight']

Train data : (1721, 532)

Train labels: (1721,)

Trained scaler saved in: output/potato\potato\_train\_scaler

Trained classifier saved in: output/potato\potato\_train\_model

end of the train process

* + 1. Test, RF

runfile('C:/Users/mjksshc2/Documents/David\'s code/EPQ codes/Test\_RF62.py', wdir='C:/Users/mjksshc2/Documents/David\'s code/EPQ codes')

Current directory is : C:\Users\mjksshc2\Documents\David's code\EPQ codes

input plant name: potato

test samples: 431

ClassNames ['Early\_blight' 'Healthy' 'Late\_blight']

Test data : (431, 532)

Test labels : (431,)

error predictions:

error for: dataset/potato\Late\_blight/fe72d959-6788-4b19-9285-e0b2919dc718\_\_\_RS\_LB 2516.JPG

test sample type Late\_blight prediction type Early\_blight

error for: dataset/potato\Late\_blight/b340ff00-3d44-4394-90c5-797dc39f8389\_\_\_RS\_LB 4953.JPG

test sample type Late\_blight prediction type Early\_blight

error for: dataset/potato\Healthy/f0fdde26-78b4-46f0-9eb8-7c2a743d34aa\_\_\_RS\_HL 4165.JPG

test sample type Healthy prediction type Late\_blight

error for: dataset/potato\Healthy/3a00204c-5e53-4e5d-95a6-f8819031744e\_\_\_RS\_HL 5420.JPG

test sample type Healthy prediction type Late\_blight

total test sample: 431

correctpredictions predictions are: 427

ClassNames ['Early\_blight' 'Healthy' 'Late\_blight']

labelclasses: [0 1 2]

totalsample: [202 29 200]

Real\_Positive: [0.99019608 1. 0.99 ]

Real\_Negative: [1. 0.9950495 0.99134199]

False\_Positive: [0.00980392 0. 0.01 ]

False\_Negative: [0. 0.0049505 0.00865801]

result metrix, row is real type, column is prediction type:

[[202 0 0]

[ 0 27 2]

[ 2 0 198]]

clf scores: 0.9907192575406032

## Tomato

* + 1. Cross validation

(There are over 10,000 sample in this dataset. The program will run for a very long time in my computer, especially, for SVM method. The total running time of method compare is at least 30 minutes) :

runfile('C:/Users/mjksshc2/Documents/David\'s code/EPQ codes/method\_compare6.py', wdir='C:/Users/mjksshc2/Documents/David\'s code/EPQ codes')

Reloaded modules: featuregen

Current directory is : C:\Users\mjksshc2\Documents\David's code\EPQ codes

input plant name: tomato

classnames ['Bacterial\_spot' 'Early\_blight' 'Healthy' 'Late\_blight' 'Leaf\_Mold'

'Septoria\_leaf\_spot' 'Spider\_mites\_Two-spotted\_spider\_mite' 'Target\_Spot'

'Tomato\_mosaic\_virus' 'Tomato\_Yellow\_Leaf\_Curl\_Virus']

[STATUS] splitted train and test data...

Train data : (14528, 532)

Train labels: (14528,)

[0.89814178 0.90433586 0.89332416 0.89332416 0.90433586 0.89194769

0.89607708 0.91259463 0.89669421 0.89669421]

LR: 0.898747 (0.006125)

[0.89057123 0.88919477 0.87336545 0.87955953 0.88300069 0.88093599

0.88162423 0.89194769 0.86019284 0.87603306]

LDA: 0.880643 (0.008943)

[0.93530626 0.94356504 0.93186511 0.9339298 0.93048864 0.93530626

0.94356504 0.94700619 0.92906336 0.934573 ]

KNN: 0.936467 (0.005799)

[0.85891259 0.85891259 0.83826566 0.86923606 0.86373021 0.85615967

0.86304198 0.87061253 0.86639118 0.85261708]

CART: 0.859788 (0.008975)

[0.97315898 0.9669649 0.96902959 0.97247075 0.97247075 0.97384721

0.96902959 0.97384721 0.97727273 0.96763085]

RF: 0.971572 (0.003109)

[0.62491397 0.63248451 0.60839642 0.60220234 0.62422574 0.61734343

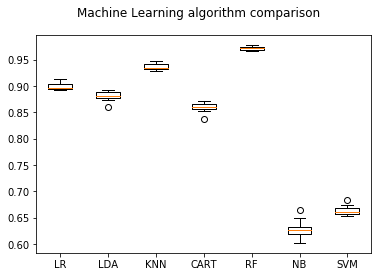
0.66414315 0.63248451 0.63016529 0.64876033]

NB: 0.628512 (0.017224)

[0.65244322 0.66139023 0.66551961 0.66827254 0.68410186 0.65657261

0.65932553 0.65313145 0.67355372 0.66184573]

SVM: 0.663616 (0.009244)



* + 1. Training, RF

runfile('C:/Users/mjksshc2/Documents/David\'s code/EPQ codes/Train\_RF61.py', wdir='C:/Users/mjksshc2/Documents/David\'s code/EPQ codes')

Current directory is : C:\Users\mjksshc2\Documents\David's code\EPQ codes

input plant name: tomato

ClassNames ['Bacterial\_spot' 'Early\_blight' 'Healthy' 'Late\_blight' 'Leaf\_Mold'

'Septoria\_leaf\_spot' 'Spider\_mites\_Two-spotted\_spider\_mite' 'Target\_Spot'

'Tomato\_mosaic\_virus' 'Tomato\_Yellow\_Leaf\_Curl\_Virus']

Train data : (14528, 532)

Train labels: (14528,)

Trained scaler saved in: output/tomato\tomato\_train\_scaler

Trained classifier saved in: output/tomato\tomato\_train\_model

end of the train process

* + 1. Test, RF

runfile('C:/Users/mjksshc2/Documents/David\'s code/EPQ codes/Test\_RF62.py', wdir='C:/Users/mjksshc2/Documents/David\'s code/EPQ codes')

Current directory is : C:\Users\mjksshc2\Documents\David's code\EPQ codes

input plant name: tomato

test samples: 3632

ClassNames ['Bacterial\_spot' 'Early\_blight' 'Healthy' 'Late\_blight' 'Leaf\_Mold'

'Septoria\_leaf\_spot' 'Spider\_mites\_Two-spotted\_spider\_mite' 'Target\_Spot'

'Tomato\_mosaic\_virus' 'Tomato\_Yellow\_Leaf\_Curl\_Virus']

Test data : (3632, 532)

Test labels : (3632,)

error predictions:

error for: dataset/tomato\Bacterial\_spot/405e216e-b24f-4688-bd81-09de831eaada\_\_\_UF.GRC\_BS\_Lab Leaf 0329.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Bacterial\_spot/b1ad1aff-89ac-47fb-ba0b-d88f1517a63f\_\_\_UF.GRC\_BS\_Lab Leaf 8824.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Early\_blight/99cfe9bb-77a1-4bd6-9c48-58fffac2a133\_\_\_RS\_Erly.B 7387.JPG

test sample type Early\_blight prediction type Bacterial\_spot

error for: dataset/tomato\Bacterial\_spot/d64951f4-a447-44c7-80b7-1143a6e4a4e8\_\_\_UF.GRC\_BS\_Lab Leaf 9190.JPG

test sample type Bacterial\_spot prediction type Late\_blight

error for: dataset/tomato\Late\_blight/3db1dcda-3180-432a-9b8e-7ba8a0d6be55\_\_\_GHLB\_PS Leaf 28.3 Day 13.JPG

test sample type Late\_blight prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Spider\_mites\_Two-spotted\_spider\_mite/4eafd895-1d10-4f48-8da7-a78220788514\_\_\_Com.G\_SpM\_FL 1204.JPG

test sample type Spider\_mites\_Two-spotted\_spider\_mite prediction type Target\_Spot

error for: dataset/tomato\Spider\_mites\_Two-spotted\_spider\_mite/68399b92-e31b-47d1-a0c0-00bb1cd1d586\_\_\_Com.G\_SpM\_FL 1212.JPG

test sample type Spider\_mites\_Two-spotted\_spider\_mite prediction type Target\_Spot

error for: dataset/tomato\Late\_blight/5ba6fbc5-a1de-4600-b0aa-9d8b8c222183\_\_\_RS\_Late.B 6181.JPG

test sample type Late\_blight prediction type Septoria\_leaf\_spot

error for: dataset/tomato\Leaf\_Mold/d8cbf2c3-f99f-4af9-a8a2-9d88e2ed0524\_\_\_Crnl\_L.Mold 7022.JPG

test sample type Leaf\_Mold prediction type Septoria\_leaf\_spot

error for: dataset/tomato\Target\_Spot/e20383b7-7f4c-4fb4-bcab-9db5df104d8b\_\_\_Com.G\_TgS\_FL 9911.JPG

test sample type Target\_Spot prediction type Bacterial\_spot

error for: dataset/tomato\Late\_blight/2164b3f8-102c-481c-9d89-7e2f6087a121\_\_\_RS\_Late.B 5065.JPG

test sample type Late\_blight prediction type Early\_blight

error for: dataset/tomato\Bacterial\_spot/4552e196-00f9-4de7-9a47-605de7a9ecd0\_\_\_UF.GRC\_BS\_Lab Leaf 9296.JPG

test sample type Bacterial\_spot prediction type Late\_blight

error for: dataset/tomato\Early\_blight/39da27eb-fde9-474b-bf0a-1374901ed82b\_\_\_RS\_Erly.B 7394.JPG

test sample type Early\_blight prediction type Bacterial\_spot

error for: dataset/tomato\Spider\_mites\_Two-spotted\_spider\_mite/618d13ab-5e53-4563-9a11-2c195fe77fcc\_\_\_Com.G\_SpM\_FL 9293.JPG

test sample type Spider\_mites\_Two-spotted\_spider\_mite prediction type Leaf\_Mold

error for: dataset/tomato\Spider\_mites\_Two-spotted\_spider\_mite/bca81576-c729-4649-bfe0-1b37d8bd314f\_\_\_Com.G\_SpM\_FL 8655.JPG

test sample type Spider\_mites\_Two-spotted\_spider\_mite prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Bacterial\_spot/d36baaa6-29eb-4bc6-8f05-252fdceee6fc\_\_\_UF.GRC\_BS\_Lab Leaf 0353.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Target\_Spot/2761adc9-bf8f-4362-87a6-7619ecf0dbbe\_\_\_Com.G\_TgS\_FL 9681.JPG

test sample type Target\_Spot prediction type Spider\_mites\_Two-spotted\_spider\_mite

error for: dataset/tomato\Bacterial\_spot/c0b98fdd-b9b8-453f-8de3-4aeec4299f8c\_\_\_GCREC\_Bact.Sp 6086.JPG

test sample type Bacterial\_spot prediction type Early\_blight

error for: dataset/tomato\Bacterial\_spot/0d56df83-84fb-4189-a5d2-3a6da18a224d\_\_\_UF.GRC\_BS\_Lab Leaf 9029.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Healthy/02b4afdf-e1de-4c0e-a38d-3f19afeb9ea9\_\_\_RS\_HL 0493.JPG

test sample type Healthy prediction type Spider\_mites\_Two-spotted\_spider\_mite

error for: dataset/tomato\Early\_blight/b4cfa208-cee0-4383-b0e2-6988814fbb9a\_\_\_RS\_Erly.B 7645.JPG

test sample type Early\_blight prediction type Bacterial\_spot

error for: dataset/tomato\Early\_blight/8f6562ec-69b1-4d97-85be-844034c98c4d\_\_\_RS\_Erly.B 7569.JPG

test sample type Early\_blight prediction type Leaf\_Mold

error for: dataset/tomato\Early\_blight/eb2537b2-d6fa-4c70-b919-f90bbe2c65f2\_\_\_RS\_Erly.B 7605.JPG

test sample type Early\_blight prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Septoria\_leaf\_spot/d2855259-5c5b-42b9-9357-67ac58d21d44\_\_\_Matt.S\_CG 7614.JPG

test sample type Septoria\_leaf\_spot prediction type Late\_blight

error for: dataset/tomato\Bacterial\_spot/bd7ff95f-02e5-491a-8bf9-5f2ac2277e7c\_\_\_UF.GRC\_BS\_Lab Leaf 0932.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Target\_Spot/41bb6805-695e-4c35-854c-ce4ed54388b3\_\_\_Com.G\_TgS\_FL 9907.JPG

test sample type Target\_Spot prediction type Early\_blight

error for: dataset/tomato\Tomato\_Yellow\_Leaf\_Curl\_Virus/5ad0f91d-2756-4b92-ae07-1945f1b71c45\_\_\_YLCV\_GCREC 5315.JPG

test sample type Tomato\_Yellow\_Leaf\_Curl\_Virus prediction type Bacterial\_spot

error for: dataset/tomato\Late\_blight/e7ad9c9f-d300-4246-8e98-4e364eb4d7b6\_\_\_GHLB Leaf 23.1 Day 18.JPG

test sample type Late\_blight prediction type Bacterial\_spot

error for: dataset/tomato\Leaf\_Mold/38ae943e-ebbd-44f9-9d58-ff760f357620\_\_\_Crnl\_L.Mold 6826.JPG

test sample type Leaf\_Mold prediction type Spider\_mites\_Two-spotted\_spider\_mite

error for: dataset/tomato\Late\_blight/0406a9d1-1b4e-42e2-814b-e03e525a51b2\_\_\_RS\_Late.B 5224.JPG

test sample type Late\_blight prediction type Early\_blight

error for: dataset/tomato\Bacterial\_spot/1a50d84b-c015-45ea-a041-500d5adcc339\_\_\_UF.GRC\_BS\_Lab Leaf 8773.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Bacterial\_spot/cb7d65bc-ae67-4686-94ce-f3fdcfc53149\_\_\_UF.GRC\_BS\_Lab Leaf 8738.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Spider\_mites\_Two-spotted\_spider\_mite/cad4659e-efce-4151-8db9-5c2799c6fdb3\_\_\_Com.G\_SpM\_FL 9475.JPG

test sample type Spider\_mites\_Two-spotted\_spider\_mite prediction type Target\_Spot

error for: dataset/tomato\Early\_blight/6b9b4ddb-9ac0-4da5-9176-24c325bd6037\_\_\_RS\_Erly.B 7392.JPG

test sample type Early\_blight prediction type Bacterial\_spot

error for: dataset/tomato\Early\_blight/d529889a-662a-4321-9bd8-888244d50af8\_\_\_RS\_Erly.B 8381.JPG

test sample type Early\_blight prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Early\_blight/0e2abcfb-e62b-4c61-a24a-0800cad904a8\_\_\_RS\_Erly.B 7382.JPG

test sample type Early\_blight prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Target\_Spot/11c87e02-aabb-4e93-a320-bae6cd4b0fb8\_\_\_Com.G\_TgS\_FL 9842.JPG

test sample type Target\_Spot prediction type Spider\_mites\_Two-spotted\_spider\_mite

error for: dataset/tomato\Late\_blight/f879b7d4-efe4-4b31-8a89-35db50d561c9\_\_\_RS\_Late.B 4897.JPG

test sample type Late\_blight prediction type Early\_blight

error for: dataset/tomato\Target\_Spot/f01a8609-e4be-4450-a889-509ca769c227\_\_\_Com.G\_TgS\_FL 9708.JPG

test sample type Target\_Spot prediction type Spider\_mites\_Two-spotted\_spider\_mite

error for: dataset/tomato\Early\_blight/47e03272-d314-4928-bf7c-eda3ba6e7371\_\_\_RS\_Erly.B 7380.JPG

test sample type Early\_blight prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Tomato\_Yellow\_Leaf\_Curl\_Virus/5e70b8f4-26db-4ac4-a23a-dac4fd0be93a\_\_\_YLCV\_GCREC 5401.JPG

test sample type Tomato\_Yellow\_Leaf\_Curl\_Virus prediction type Bacterial\_spot

error for: dataset/tomato\Tomato\_mosaic\_virus/1ccfd473-6b3d-47a9-897b-0653d7683d75\_\_\_PSU\_CG 2163.JPG

test sample type Tomato\_mosaic\_virus prediction type Target\_Spot

error for: dataset/tomato\Spider\_mites\_Two-spotted\_spider\_mite/c3d5afc0-3021-429e-a9fa-aed4c8393f83\_\_\_Com.G\_SpM\_FL 8868.JPG

test sample type Spider\_mites\_Two-spotted\_spider\_mite prediction type Target\_Spot

error for: dataset/tomato\Tomato\_Yellow\_Leaf\_Curl\_Virus/31c09944-817c-4187-a9bb-809f90c25068\_\_\_YLCV\_GCREC 2714.JPG

test sample type Tomato\_Yellow\_Leaf\_Curl\_Virus prediction type Early\_blight

error for: dataset/tomato\Early\_blight/0d5f65a3-b32f-4565-b63a-c6da73c1322b\_\_\_RS\_Erly.B 8310.JPG

test sample type Early\_blight prediction type Late\_blight

error for: dataset/tomato\Healthy/ce081d63-8710-460f-9f20-cc67ef62fa37\_\_\_RS\_HL 9685.JPG

test sample type Healthy prediction type Septoria\_leaf\_spot

error for: dataset/tomato\Early\_blight/a48e8b60-3636-4f7e-8ce2-d6625d866720\_\_\_RS\_Erly.B 7458.JPG

test sample type Early\_blight prediction type Bacterial\_spot

error for: dataset/tomato\Late\_blight/1546f916-115c-42dc-90c7-ff8d53c4273f\_\_\_RS\_Late.B 4836.JPG

test sample type Late\_blight prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Tomato\_mosaic\_virus/570486a0-abe0-4046-add9-14aab37de620\_\_\_PSU\_CG 2313.JPG

test sample type Tomato\_mosaic\_virus prediction type Leaf\_Mold

error for: dataset/tomato\Target\_Spot/ef8ab838-77f2-4046-af5d-935b178f910b\_\_\_Com.G\_TgS\_FL 8050.JPG

test sample type Target\_Spot prediction type Septoria\_leaf\_spot

error for: dataset/tomato\Septoria\_leaf\_spot/f2da8749-74f6-4b2f-9363-7ccf73e0fa1f\_\_\_Matt.S\_CG 5991.JPG

test sample type Septoria\_leaf\_spot prediction type Bacterial\_spot

error for: dataset/tomato\Septoria\_leaf\_spot/b4d1fd1c-27f2-476a-8d86-4636028ea4ab\_\_\_Matt.S\_CG 1271.JPG

test sample type Septoria\_leaf\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Septoria\_leaf\_spot/80737668-73b1-4dfc-a7ad-76f996ba72b7\_\_\_Matt.S\_CG 5996.JPG

test sample type Septoria\_leaf\_spot prediction type Bacterial\_spot

error for: dataset/tomato\Septoria\_leaf\_spot/e6d9f6dd-1349-4d66-8bae-7be416b48d15\_\_\_JR\_Sept.L.S 8360.JPG

test sample type Septoria\_leaf\_spot prediction type Late\_blight

error for: dataset/tomato\Early\_blight/ccd788af-4fd4-46a5-96af-c6ad44314d45\_\_\_RS\_Erly.B 8436.JPG

test sample type Early\_blight prediction type Late\_blight

error for: dataset/tomato\Bacterial\_spot/15a1998e-4b4d-446b-98e7-46ed98119495\_\_\_UF.GRC\_BS\_Lab Leaf 0222.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Healthy/c9bc09dd-7a19-46b6-ac5a-d857d50f0e5c\_\_\_RS\_HL 0484.JPG

test sample type Healthy prediction type Spider\_mites\_Two-spotted\_spider\_mite

error for: dataset/tomato\Bacterial\_spot/fe5de322-e644-44d7-9492-86cc6ed022b5\_\_\_UF.GRC\_BS\_Lab Leaf 9072.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Early\_blight/2245fdf5-3ff5-4624-9797-0b65bcc6cf73\_\_\_RS\_Erly.B 6358.JPG

test sample type Early\_blight prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Early\_blight/5ac465b8-86c9-469a-a656-add4ab1f14e4\_\_\_RS\_Erly.B 6473.JPG

test sample type Early\_blight prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Early\_blight/bb843f3f-a4cd-4a42-94ff-152199d78895\_\_\_RS\_Erly.B 7381.JPG

test sample type Early\_blight prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Target\_Spot/f7356c7c-af6b-4bb6-b842-dcd446f981e9\_\_\_Com.G\_TgS\_FL 8047.JPG

test sample type Target\_Spot prediction type Septoria\_leaf\_spot

error for: dataset/tomato\Septoria\_leaf\_spot/abdebe47-6f94-4284-a9c9-4bbf78eeb7c7\_\_\_Matt.S\_CG 1274.JPG

test sample type Septoria\_leaf\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Bacterial\_spot/81497af9-6503-4379-9d8e-240f43f89006\_\_\_UF.GRC\_BS\_Lab Leaf 0245.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Tomato\_Yellow\_Leaf\_Curl\_Virus/21970f61-4191-485f-bf85-4ce2d66d5fb5\_\_\_YLCV\_GCREC 2532.JPG

test sample type Tomato\_Yellow\_Leaf\_Curl\_Virus prediction type Bacterial\_spot

error for: dataset/tomato\Bacterial\_spot/08fd8d64-fdb3-49bb-93d9-6635ced701d4\_\_\_UF.GRC\_BS\_Lab Leaf 0272.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Bacterial\_spot/086dd5ed-279a-458b-aa4a-1484305ac21c\_\_\_UF.GRC\_BS\_Lab Leaf 8835.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Spider\_mites\_Two-spotted\_spider\_mite/3046afbf-4a9a-41fb-a64f-3f9e75af08e7\_\_\_Com.G\_SpM\_FL 1623.JPG

test sample type Spider\_mites\_Two-spotted\_spider\_mite prediction type Target\_Spot

error for: dataset/tomato\Bacterial\_spot/5b65716f-ed7d-42cc-b9b6-c7712782f366\_\_\_UF.GRC\_BS\_Lab Leaf 9230.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Late\_blight/6f631d1f-06c4-4314-95fd-f79d5344cfba\_\_\_RS\_Late.B 5027.JPG

test sample type Late\_blight prediction type Early\_blight

error for: dataset/tomato\Septoria\_leaf\_spot/2b66d465-d98a-405a-9775-3b03ac58e7e5\_\_\_Matt.S\_CG 0757.JPG

test sample type Septoria\_leaf\_spot prediction type Late\_blight

error for: dataset/tomato\Septoria\_leaf\_spot/f15d2ee7-3710-4f31-bdc7-3215a27a7ae9\_\_\_Matt.S\_CG 1282.JPG

test sample type Septoria\_leaf\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Healthy/4959798b-5c9b-4f8e-b0a0-3778259614b1\_\_\_CG1.JPG

test sample type Healthy prediction type Late\_blight

error for: dataset/tomato\Early\_blight/8714986a-ae97-489a-8259-67411bfa2379\_\_\_RS\_Erly.B 9400.JPG

test sample type Early\_blight prediction type Late\_blight

error for: dataset/tomato\Early\_blight/38c6a01b-91c0-431b-8f58-05fa43cf94b7\_\_\_RS\_Erly.B 9408.JPG

test sample type Early\_blight prediction type Late\_blight

error for: dataset/tomato\Late\_blight/e1501757-3235-4051-b460-52c0f6e45add\_\_\_RS\_Late.B 4910.JPG

test sample type Late\_blight prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Bacterial\_spot/bd5b5a19-a9b0-4572-9920-8ed728c15804\_\_\_GCREC\_Bact.Sp 3653.JPG

test sample type Bacterial\_spot prediction type Target\_Spot

error for: dataset/tomato\Leaf\_Mold/780aabe7-0d54-4849-80b8-773552ca4b45\_\_\_Crnl\_L.Mold 8824.JPG

test sample type Leaf\_Mold prediction type Septoria\_leaf\_spot

error for: dataset/tomato\Late\_blight/d28bd097-8584-4269-a82b-43d6f5df787b\_\_\_RS\_Late.B 4832.JPG

test sample type Late\_blight prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Septoria\_leaf\_spot/de4a4bd4-b611-46fd-8190-cff651b56326\_\_\_Matt.S\_CG 6718.JPG

test sample type Septoria\_leaf\_spot prediction type Spider\_mites\_Two-spotted\_spider\_mite

error for: dataset/tomato\Bacterial\_spot/acbad9e6-d801-48d5-92ee-9fae23fcfb93\_\_\_UF.GRC\_BS\_Lab Leaf 0250.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Early\_blight/dc29e8de-633c-472e-8e12-c1a032437d1e\_\_\_RS\_Erly.B 8447.JPG

test sample type Early\_blight prediction type Late\_blight

error for: dataset/tomato\Late\_blight/993a04d9-3bfe-4cd2-8f89-981a0bb2405c\_\_\_RS\_Late.B 4956.JPG

test sample type Late\_blight prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Tomato\_Yellow\_Leaf\_Curl\_Virus/0ae5c8c7-af28-42b4-a312-efd080f76c1a\_\_\_YLCV\_GCREC 5464.JPG

test sample type Tomato\_Yellow\_Leaf\_Curl\_Virus prediction type Late\_blight

error for: dataset/tomato\Bacterial\_spot/ccb77acf-506d-4ebe-a35c-12bbd9e0825f\_\_\_UF.GRC\_BS\_Lab Leaf 0653.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Late\_blight/1a895389-ec7f-4622-afaf-9afe6c16a26a\_\_\_RS\_Late.B 5172.JPG

test sample type Late\_blight prediction type Early\_blight

error for: dataset/tomato\Early\_blight/73cf82cf-a099-4243-a7a6-b06c79eedb65\_\_\_RS\_Erly.B 7412.JPG

test sample type Early\_blight prediction type Bacterial\_spot

error for: dataset/tomato\Late\_blight/4f12205c-0035-48ed-b6b0-56f347fe2ab0\_\_\_RS\_Late.B 5085.JPG

test sample type Late\_blight prediction type Early\_blight

error for: dataset/tomato\Early\_blight/82b12772-f0ea-4d47-9e1e-8f03bb1c20c5\_\_\_RS\_Erly.B 7429.JPG

test sample type Early\_blight prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Late\_blight/cb3bd866-dd84-4f7e-9226-b4a2a2c7f2ae\_\_\_GH\_HL Leaf 173.2.JPG

test sample type Late\_blight prediction type Healthy

error for: dataset/tomato\Late\_blight/873aa4b3-61f8-473a-8fd3-b39ede9376c4\_\_\_RS\_Late.B 4829.JPG

test sample type Late\_blight prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Leaf\_Mold/e7391b48-0b36-41fd-81f0-35c6b5a24d0a\_\_\_Crnl\_L.Mold 6761.JPG

test sample type Leaf\_Mold prediction type Late\_blight

error for: dataset/tomato\Septoria\_leaf\_spot/6747e2b4-5b8a-4c82-94b8-0145e32d81de\_\_\_Matt.S\_CG 7570.JPG

test sample type Septoria\_leaf\_spot prediction type Late\_blight

error for: dataset/tomato\Spider\_mites\_Two-spotted\_spider\_mite/b6c84c96-c05b-426a-8b3e-f55338ece18e\_\_\_Com.G\_SpM\_FL 1143.JPG

test sample type Spider\_mites\_Two-spotted\_spider\_mite prediction type Target\_Spot

error for: dataset/tomato\Early\_blight/fcf8557f-890e-441b-9dc1-c8854f694f2e\_\_\_RS\_Erly.B 9505.JPG

test sample type Early\_blight prediction type Late\_blight

error for: dataset/tomato\Early\_blight/ac57ab70-6d8c-4065-8bab-3a88b5239aea\_\_\_RS\_Erly.B 7408.JPG

test sample type Early\_blight prediction type Bacterial\_spot

error for: dataset/tomato\Spider\_mites\_Two-spotted\_spider\_mite/77c058b8-2001-4416-8c49-0eb206ba4f57\_\_\_Com.G\_SpM\_FL 1219.JPG

test sample type Spider\_mites\_Two-spotted\_spider\_mite prediction type Tomato\_mosaic\_virus

error for: dataset/tomato\Early\_blight/ab1f0275-f2db-4dcf-befb-8921c6101b80\_\_\_RS\_Erly.B 7596.JPG

test sample type Early\_blight prediction type Late\_blight

error for: dataset/tomato\Early\_blight/fa5e382e-d1ad-42f9-a4e5-afb343f77a53\_\_\_RS\_Erly.B 9453.JPG

test sample type Early\_blight prediction type Late\_blight

error for: dataset/tomato\Tomato\_Yellow\_Leaf\_Curl\_Virus/56952d19-2a4a-4252-a114-81ce80eb1f00\_\_\_YLCV\_GCREC 2716.JPG

test sample type Tomato\_Yellow\_Leaf\_Curl\_Virus prediction type Early\_blight

error for: dataset/tomato\Bacterial\_spot/2c0d4b4f-d53f-4acc-bc40-ae766236b526\_\_\_UF.GRC\_BS\_Lab Leaf 9298.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Spider\_mites\_Two-spotted\_spider\_mite/cf840e2d-8847-44e4-9589-540aefa69895\_\_\_Com.G\_SpM\_FL 8544.JPG

test sample type Spider\_mites\_Two-spotted\_spider\_mite prediction type Target\_Spot

error for: dataset/tomato\Target\_Spot/ed60a782-22dd-4aa6-b16e-494b75fd3174\_\_\_Com.G\_TgS\_FL 9896.JPG

test sample type Target\_Spot prediction type Spider\_mites\_Two-spotted\_spider\_mite

error for: dataset/tomato\Early\_blight/7a259d3d-cca4-4041-88ec-d3140cd96f25\_\_\_RS\_Erly.B 7415.JPG

test sample type Early\_blight prediction type Bacterial\_spot

error for: dataset/tomato\Septoria\_leaf\_spot/fbbb8eca-408d-476e-b9a0-b0162f66506c\_\_\_Matt.S\_CG 7728.JPG

test sample type Septoria\_leaf\_spot prediction type Late\_blight

error for: dataset/tomato\Late\_blight/a63362e0-5e9f-4056-b66b-2f3fc23ea932\_\_\_GHLB2 Leaf 111.2.JPG

test sample type Late\_blight prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Target\_Spot/f8d791bc-1b26-40e5-ad02-c45ed79aa128\_\_\_Com.G\_TgS\_FL 9928.JPG

test sample type Target\_Spot prediction type Spider\_mites\_Two-spotted\_spider\_mite

error for: dataset/tomato\Target\_Spot/988132c4-574d-471e-9c51-d9b14ab2e45e\_\_\_Com.G\_TgS\_FL 9909.JPG

test sample type Target\_Spot prediction type Early\_blight

error for: dataset/tomato\Septoria\_leaf\_spot/b36baca9-7ebc-4abc-b0fd-a05871925c6e\_\_\_Matt.S\_CG 7725.JPG

test sample type Septoria\_leaf\_spot prediction type Late\_blight

error for: dataset/tomato\Early\_blight/f88be630-f853-48f8-b546-a2f7966368a2\_\_\_RS\_Erly.B 7418.JPG

test sample type Early\_blight prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Target\_Spot/35b0ec56-80f9-4fee-bbf4-b80f782ad37b\_\_\_Com.G\_TgS\_FL 9985.JPG

test sample type Target\_Spot prediction type Spider\_mites\_Two-spotted\_spider\_mite

error for: dataset/tomato\Early\_blight/f4d4fe0b-d711-4a2c-b331-213787eda9b0\_\_\_RS\_Erly.B 6665.JPG

test sample type Early\_blight prediction type Septoria\_leaf\_spot

error for: dataset/tomato\Early\_blight/47c05777-ef2f-4baf-8f1a-61ab067a4627\_\_\_RS\_Erly.B 7350.JPG

test sample type Early\_blight prediction type Bacterial\_spot

error for: dataset/tomato\Late\_blight/1627cb48-dc80-46a1-bda0-b677c32fbf56\_\_\_RS\_Late.B 5066.JPG

test sample type Late\_blight prediction type Early\_blight

error for: dataset/tomato\Septoria\_leaf\_spot/07a4190c-b0c0-4e03-9ad5-474938c837d2\_\_\_Matt.S\_CG 1242.JPG

test sample type Septoria\_leaf\_spot prediction type Bacterial\_spot

error for: dataset/tomato\Late\_blight/6bb72ae0-dc39-4098-bc4e-e09044990c5c\_\_\_RS\_Late.B 4868.JPG

test sample type Late\_blight prediction type Early\_blight

error for: dataset/tomato\Target\_Spot/c14f2bd5-69dd-4436-a0cf-d56204da178c\_\_\_Com.G\_TgS\_FL 9667.JPG

test sample type Target\_Spot prediction type Spider\_mites\_Two-spotted\_spider\_mite

error for: dataset/tomato\Spider\_mites\_Two-spotted\_spider\_mite/bb240371-2ef1-4421-a638-41ba2ef45b83\_\_\_Com.G\_SpM\_FL 1134.JPG

test sample type Spider\_mites\_Two-spotted\_spider\_mite prediction type Target\_Spot

error for: dataset/tomato\Early\_blight/65568918-2d9c-4f0c-aa9d-3f4fa8b9a60c\_\_\_RS\_Erly.B 7354.JPG

test sample type Early\_blight prediction type Bacterial\_spot

error for: dataset/tomato\Bacterial\_spot/7688c6b6-910a-4f6f-854e-e00bf11ce9b0\_\_\_UF.GRC\_BS\_Lab Leaf 9045.JPG

test sample type Bacterial\_spot prediction type Tomato\_Yellow\_Leaf\_Curl\_Virus

error for: dataset/tomato\Bacterial\_spot/47a3c2c9-1f3b-4d42-8857-cfc714042c2a\_\_\_UF.GRC\_BS\_Lab Leaf 8631.JPG

test sample type Bacterial\_spot prediction type Late\_blight

error for: dataset/tomato\Early\_blight/04e38351-80bc-4260-8a4d-187f7817c3e5\_\_\_RS\_Erly.B 7439.JPG

test sample type Early\_blight prediction type Late\_blight

error for: dataset/tomato\Early\_blight/38685009-d6e6-4b3a-9957-bf049a210cda\_\_\_RS\_Erly.B 7606.JPG

test sample type Early\_blight prediction type Bacterial\_spot

error for: dataset/tomato\Early\_blight/26b721c9-94fd-4e19-bb7e-521238eb8a1b\_\_\_RS\_Erly.B 9380.JPG

test sample type Early\_blight prediction type Late\_blight

error for: dataset/tomato\Late\_blight/0c3153b2-0e64-41b6-902a-66eafbf7cae6\_\_\_GHLB Leaf 4.1 Day 1.JPG

test sample type Late\_blight prediction type Bacterial\_spot

error for: dataset/tomato\Leaf\_Mold/bf7b77e1-6438-45ee-b226-cb69b745a4bc\_\_\_Crnl\_L.Mold 8756.JPG

test sample type Leaf\_Mold prediction type Septoria\_leaf\_spot

total test sample: 3632

correctpredictions predictions are: 3506

ClassNames ['Bacterial\_spot' 'Early\_blight' 'Healthy' 'Late\_blight' 'Leaf\_Mold'

'Septoria\_leaf\_spot' 'Spider\_mites\_Two-spotted\_spider\_mite' 'Target\_Spot'

'Tomato\_mosaic\_virus' 'Tomato\_Yellow\_Leaf\_Curl\_Virus']

labelclasses: [0 1 2 3 4 5 6 7 8 9]

totalsample: [ 400 196 296 417 196 347 350 248 89 1093]

Real\_Positive: [0.94974874 0.92655367 0.99658703 0.94761905 0.98453608 0.97660819

0.96857143 0.95934959 0.98863636 0.96708185]

Real\_Negative: [0.99319728 0.99073806 0.99880204 0.99408468 0.99854567 0.99604863

0.99664839 0.996456 0.99943567 0.99760766]

False\_Positive: [0.05025126 0.07344633 0.00341297 0.05238095 0.01546392 0.02339181

0.03142857 0.04065041 0.01136364 0.03291815]

False\_Negative: [0.00680272 0.00926194 0.00119796 0.00591532 0.00145433 0.00395137

0.00335161 0.003544 0.00056433 0.00239234]

result metrix, row is real type, column is prediction type:

[[ 378 1 0 3 0 0 0 1 0 17]

[ 11 164 0 10 1 1 0 0 0 9]

[ 0 0 292 1 0 1 2 0 0 0]

[ 2 8 1 398 0 1 0 0 0 7]

[ 0 0 0 1 191 3 1 0 0 0]

[ 3 0 0 6 0 334 1 0 0 3]

[ 0 0 0 0 1 0 339 8 1 1]

[ 1 2 0 0 0 2 7 236 0 0]

[ 0 0 0 0 1 0 0 1 87 0]

[ 3 2 0 1 0 0 0 0 0 1087]]

clf scores: 0.9653083700440529

## Apple

* + 1. Cross validation

runfile('C:/Users/mjksshc2/Documents/David\'s code/EPQ codes/method\_compare6.py', wdir='C:/Users/mjksshc2/Documents/David\'s code/EPQ codes')

Reloaded modules: featuregen

Current directory is : C:\Users\mjksshc2\Documents\David's code\EPQ codes

input plant name: apple

classnames ['Apple\_scab' 'Cedar\_apple\_rust' 'Frogeye\_Spot' 'Healthy']

[STATUS] splitted train and test data...

Train data : (2536, 532)

Train labels: (2536,)

[0.95669291 0.9488189 0.97244094 0.96850394 0.94488189 0.95275591

0.96047431 0.97628458 0.96837945 0.93280632]

LR: 0.958204 (0.012988)

[0.95669291 0.94094488 0.9488189 0.96456693 0.94094488 0.9488189

0.93675889 0.96047431 0.94466403 0.96047431]

LDA: 0.950316 (0.009198)

[0.94488189 0.92913386 0.96456693 0.96456693 0.96062992 0.96456693

0.96442688 0.96047431 0.98023715 0.95652174]

KNN: 0.959001 (0.012945)

[0.90551181 0.89370079 0.91338583 0.93700787 0.91732283 0.90551181

0.92490119 0.92094862 0.91699605 0.89328063]

CART: 0.912857 (0.012997)

[0.98425197 0.98425197 0.98425197 0.98031496 0.97244094 0.98425197

0.98023715 0.98023715 0.97233202 0.98814229]

RF: 0.981071 (0.004932)

[0.83464567 0.8976378 0.85433071 0.84251969 0.86614173 0.85826772

0.87747036 0.82608696 0.8458498 0.88537549]

NB: 0.858833 (0.021734)

[0.57086614 0.62598425 0.5984252 0.60629921 0.63385827 0.67716535

0.66007905 0.6284585 0.66403162 0.66798419]

SVM: 0.633315 (0.032725)

* + 1. Training, RF

runfile('C:/Users/mjksshc2/Documents/David\'s code/EPQ codes/Train\_RF61.py', wdir='C:/Users/mjksshc2/Documents/David\'s code/EPQ codes')

Current directory is : C:\Users\mjksshc2\Documents\David's code\EPQ codes

input plant name: apple

ClassNames ['Apple\_scab' 'Cedar\_apple\_rust' 'Frogeye\_Spot' 'Healthy']

Train data : (2536, 532)

Train labels: (2536,)

Trained scaler saved in: output/apple\apple\_train\_scaler

Trained classifier saved in: output/apple\apple\_train\_model

end of the train process

* + 1. Test, RF

runfile('C:/Users/mjksshc2/Documents/David\'s code/EPQ codes/Test\_RF62.py', wdir='C:/Users/mjksshc2/Documents/David\'s code/EPQ codes')

Current directory is : C:\Users\mjksshc2\Documents\David's code\EPQ codes

input plant name: apple

test samples: 635

ClassNames ['Apple\_scab' 'Cedar\_apple\_rust' 'Frogeye\_Spot' 'Healthy']

Test data : (635, 532)

Test labels : (635,)

error predictions:

error for: dataset/Apple\Apple\_scab/1f97d75c-db85-4344-8687-82ca56454d17\_\_\_FREC\_Scab 3408.JPG

test sample type Apple\_scab prediction type Healthy

error for: dataset/Apple\Apple\_scab/c7dc7cfa-559a-4950-ba71-90d11dfe0b56\_\_\_FREC\_Scab 3381.JPG

test sample type Apple\_scab prediction type Cedar\_apple\_rust

error for: dataset/Apple\Frogeye\_Spot/4d79f0a2-0f8a-406b-84de-2c7e74027d6f\_\_\_JR\_FrgE.S 3061.JPG

test sample type Frogeye\_Spot prediction type Healthy

error for: dataset/Apple\Healthy/1c85fc77-1843-4a85-8f21-107385d5873c\_\_\_RS\_HL 7272.JPG

test sample type Healthy prediction type Apple\_scab

error for: dataset/Apple\Apple\_scab/eda0a3b5-fe6e-4646-acc6-7db5179e3e96\_\_\_FREC\_Scab 3380.JPG

test sample type Apple\_scab prediction type Healthy

error for: dataset/Apple\Healthy/23b5f9bf-18d8-43d3-a289-6398a7abde91\_\_\_RS\_HL 7914.JPG

test sample type Healthy prediction type Apple\_scab

error for: dataset/Apple\Frogeye\_Spot/e54ced2f-6766-41f4-99d5-87ffc2a81cbc\_\_\_JR\_FrgE.S 8694.JPG

test sample type Frogeye\_Spot prediction type Healthy

error for: dataset/Apple\Apple\_scab/6b66d8dd-af9f-43b5-a43f-6e4c6d64bede\_\_\_FREC\_Scab 3248.JPG

test sample type Apple\_scab prediction type Healthy

error for: dataset/Apple\Healthy/e323a987-eb04-44a2-aaa0-0d85518bb3dd\_\_\_RS\_HL 7668.JPG

test sample type Healthy prediction type Apple\_scab

error for: dataset/Apple\Cedar\_apple\_rust/cf570118-397c-434d-b158-d3539dd12786\_\_\_FREC\_C.Rust 0122.JPG

test sample type Cedar\_apple\_rust prediction type Apple\_scab

total test sample: 635

correctpredictions predictions are: 625

ClassNames ['Apple\_scab' 'Cedar\_apple\_rust' 'Frogeye\_Spot' 'Healthy']

labelclasses: [0 1 2 3]

totalsample: [127 46 131 331]

Real\_Positive: [0.96850394 0.97826087 1. 0.98498498]

Real\_Negative: [0.99212598 0.99830221 0.99604743 0.99006623]

False\_Positive: [0.03149606 0.02173913 0. 0.01501502]

False\_Negative: [0.00787402 0.00169779 0.00395257 0.00993377]

result metrix, row is real type, column is prediction type:

[[123 1 0 3]

[ 1 45 0 0]

[ 0 0 129 2]

[ 3 0 0 328]]

clf scores: 0.984251968503937

## Grape

* + 1. Cross validation

runfile('C:/Users/mjksshc2/Documents/David\'s code/EPQ codes/method\_compare6.py', wdir='C:/Users/mjksshc2/Documents/David\'s code/EPQ codes')

Reloaded modules: featuregen

Current directory is : C:\Users\mjksshc2\Documents\David's code\EPQ codes

input plant name: grape

classnames ['Black\_rot' 'Esca\_Black\_Measles' 'Healthy'

'Leaf\_blight\_Isariopsis\_Leaf\_Spot']

[STATUS] splitted train and test data...

Train data : (3249, 532)

Train labels: (3249,)

[0.95076923 0.94461538 0.94153846 0.95076923 0.95076923 0.94769231

0.95076923 0.96 0.95076923 0.94753086]

LR: 0.949522 (0.004612)

[0.96307692 0.93538462 0.93538462 0.95692308 0.94769231 0.95076923

0.94769231 0.97538462 0.95692308 0.95987654]

LDA: 0.952911 (0.011673)

[0.95692308 0.95076923 0.96 0.95384615 0.96307692 0.96307692

0.95384615 0.97538462 0.95384615 0.96604938]

KNN: 0.959682 (0.007067)

[0.89846154 0.91384615 0.90461538 0.86769231 0.94153846 0.90769231

0.92615385 0.91384615 0.93846154 0.91666667]

CART: 0.912897 (0.020033)

[0.96615385 0.97230769 0.97538462 0.98769231 0.97538462 0.98153846

0.97230769 0.98769231 0.96923077 0.97839506]

RF: 0.976609 (0.006906)

[0.88 0.86461538 0.88 0.85230769 0.84615385 0.86461538

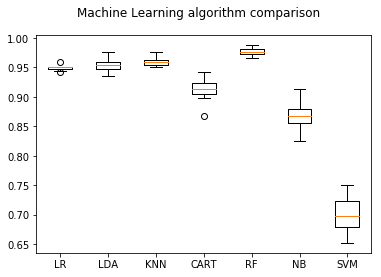
0.87076923 0.91384615 0.82461538 0.90740741]

NB: 0.870433 (0.025534)

[0.69230769 0.65230769 0.67384615 0.75076923 0.70461538 0.72615385

0.67692308 0.73230769 0.71692308 0.6882716 ]

SVM: 0.701443 (0.028775)



* + 1. Training, RF

runfile('C:/Users/mjksshc2/Documents/David\'s code/EPQ codes/Train\_RF61.py', wdir='C:/Users/mjksshc2/Documents/David\'s code/EPQ codes')

Current directory is : C:\Users\mjksshc2\Documents\David's code\EPQ codes

input plant name: grape

ClassNames ['Black\_rot' 'Esca\_Black\_Measles' 'Healthy'

'Leaf\_blight\_Isariopsis\_Leaf\_Spot']

Train data : (3249, 532)

Train labels: (3249,)

Trained scaler saved in: output/grape\grape\_train\_scaler

Trained classifier saved in: output/grape\grape\_train\_model

end of the train process

* + 1. Test, RF

runfile('C:/Users/mjksshc2/Documents/David\'s code/EPQ codes/Test\_RF62.py', wdir='C:/Users/mjksshc2/Documents/David\'s code/EPQ codes')

Current directory is : C:\Users\mjksshc2\Documents\David's code\EPQ codes

input plant name: grape

test samples: 813

ClassNames ['Black\_rot' 'Esca\_Black\_Measles' 'Healthy'

'Leaf\_blight\_Isariopsis\_Leaf\_Spot']

Test data : (813, 532)

Test labels : (813,)

error predictions:

error for: dataset/grape\Esca\_Black\_Measles/d35a873e-fa01-4c28-9140-f46a37ef1e59\_\_\_FAM\_B.Msls 0895.JPG

test sample type Esca\_Black\_Measles prediction type Black\_rot

error for: dataset/grape\Esca\_Black\_Measles/2ffcdbee-105e-4c6e-801f-fd6475e4aaa0\_\_\_FAM\_B.Msls 4358.JPG

test sample type Esca\_Black\_Measles prediction type Black\_rot

error for: dataset/grape\Esca\_Black\_Measles/3c80b795-c607-4557-bc54-ac5a7ee27809\_\_\_FAM\_B.Msls 0878.JPG

test sample type Esca\_Black\_Measles prediction type Black\_rot

error for: dataset/grape\Black\_rot/d05f4253-0a89-4ced-979c-cedd9d464971\_\_\_FAM\_B.Rot 3236.JPG

test sample type Black\_rot prediction type Leaf\_blight\_Isariopsis\_Leaf\_Spot

error for: dataset/grape\Leaf\_blight\_Isariopsis\_Leaf\_Spot/a4efefb3-fc8d-4ce9-8d87-bd1ac5115cb1\_\_\_FAM\_L.Blight 1435.JPG

test sample type Leaf\_blight\_Isariopsis\_Leaf\_Spot prediction type Black\_rot

error for: dataset/grape\Esca\_Black\_Measles/2f97ddbd-4543-4229-8028-9ddfc88bf831\_\_\_FAM\_B.Msls 1226.JPG

test sample type Esca\_Black\_Measles prediction type Black\_rot

error for: dataset/grape\Black\_rot/6ef8c44c-fe48-4699-bf2c-a72b9c94affb\_\_\_FAM\_B.Rot 3311.JPG

test sample type Black\_rot prediction type Leaf\_blight\_Isariopsis\_Leaf\_Spot

error for: dataset/grape\Esca\_Black\_Measles/33294c86-f629-406b-a151-3d500c5dfe18\_\_\_FAM\_B.Msls 4440.JPG

test sample type Esca\_Black\_Measles prediction type Black\_rot

error for: dataset/grape\Leaf\_blight\_Isariopsis\_Leaf\_Spot/200b0ce7-899b-4cfe-b36b-1202ad34bc50\_\_\_FAM\_L.Blight 1617.JPG

test sample type Leaf\_blight\_Isariopsis\_Leaf\_Spot prediction type Black\_rot

error for: dataset/grape\Esca\_Black\_Measles/aa1db1a9-86ec-4107-9d40-9ae12e52798e\_\_\_FAM\_B.Msls 1353.JPG

test sample type Esca\_Black\_Measles prediction type Black\_rot

error for: dataset/grape\Esca\_Black\_Measles/111b8c34-4f71-4c88-949c-11a8369da8eb\_\_\_FAM\_B.Msls 1297.JPG

test sample type Esca\_Black\_Measles prediction type Black\_rot

error for: dataset/grape\Leaf\_blight\_Isariopsis\_Leaf\_Spot/61035474-7322-4ef0-82f6-9fbc8deed18f\_\_\_FAM\_L.Blight 4604.JPG

test sample type Leaf\_blight\_Isariopsis\_Leaf\_Spot prediction type Black\_rot

error for: dataset/grape\Leaf\_blight\_Isariopsis\_Leaf\_Spot/3639e4e9-8913-4701-a512-730ae73cdbfe\_\_\_FAM\_L.Blight 1439.JPG

test sample type Leaf\_blight\_Isariopsis\_Leaf\_Spot prediction type Black\_rot

error for: dataset/grape\Esca\_Black\_Measles/0ac1749b-6c4a-4a60-92d4-f4e957cfa4b4\_\_\_FAM\_B.Msls 0887.JPG

test sample type Esca\_Black\_Measles prediction type Black\_rot

error for: dataset/grape\Esca\_Black\_Measles/ac3e8aeb-be50-4c98-a0f3-fb5d9860c459\_\_\_FAM\_B.Msls 0823.JPG

test sample type Esca\_Black\_Measles prediction type Black\_rot

error for: dataset/grape\Leaf\_blight\_Isariopsis\_Leaf\_Spot/80a81205-f5b3-477b-b3a1-3982a8ff2435\_\_\_FAM\_L.Blight 0813.JPG

test sample type Leaf\_blight\_Isariopsis\_Leaf\_Spot prediction type Black\_rot

error for: dataset/grape\Esca\_Black\_Measles/dead31a7-e533-413b-abb1-73a687145bbe\_\_\_FAM\_B.Msls 0827.JPG

test sample type Esca\_Black\_Measles prediction type Black\_rot

error for: dataset/grape\Leaf\_blight\_Isariopsis\_Leaf\_Spot/3b56f6d8-2fae-4a64-b480-dfc1fce0ebef\_\_\_FAM\_L.Blight 0790.JPG

test sample type Leaf\_blight\_Isariopsis\_Leaf\_Spot prediction type Esca\_Black\_Measles

error for: dataset/grape\Esca\_Black\_Measles/ed99773d-d7ad-4d6d-a114-5311a02d0fda\_\_\_FAM\_B.Msls 1875.JPG

test sample type Esca\_Black\_Measles prediction type Black\_rot

error for: dataset/grape\Esca\_Black\_Measles/f9e452d3-c5a1-4670-907e-b1498c25a872\_\_\_FAM\_B.Msls 4456.JPG

test sample type Esca\_Black\_Measles prediction type Black\_rot

error for: dataset/grape\Esca\_Black\_Measles/1c47bebb-90ac-4161-8716-78b3475cddea\_\_\_FAM\_B.Msls 1283.JPG

test sample type Esca\_Black\_Measles prediction type Black\_rot

error for: dataset/grape\Esca\_Black\_Measles/f6d42acb-e09e-4cf4-bee0-175c3d1b8ff7\_\_\_FAM\_B.Msls 1864.JPG

test sample type Esca\_Black\_Measles prediction type Black\_rot

error for: dataset/grape\Black\_rot/6f45e522-2142-49ea-bdd9-d52ecfea5642\_\_\_FAM\_B.Rot 0401.JPG

test sample type Black\_rot prediction type Esca\_Black\_Measles

error for: dataset/grape\Leaf\_blight\_Isariopsis\_Leaf\_Spot/4fb37ee9-170c-4edf-88a1-60f2d0b245be\_\_\_FAM\_L.Blight 1560.JPG

test sample type Leaf\_blight\_Isariopsis\_Leaf\_Spot prediction type Black\_rot

total test sample: 813

correctpredictions predictions are: 789

ClassNames ['Black\_rot' 'Esca\_Black\_Measles' 'Healthy'

'Leaf\_blight\_Isariopsis\_Leaf\_Spot']

labelclasses: [0 1 2 3]

totalsample: [251 268 82 212]

Real\_Positive: [0.92537313 0.9921875 1. 0.99033816]

Real\_Negative: [0.99449541 0.97486535 1. 0.98844884]

False\_Positive: [0.07462687 0.0078125 0. 0.00966184]

False\_Negative: [0.00550459 0.02513465 0. 0.01155116]

result metrix, row is real type, column is prediction type:

[[248 1 0 2]

[ 14 254 0 0]

[ 0 0 82 0]

[ 6 1 0 205]]

clf scores: 0.9704797047970479

# Method compare over various crops

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | corn | Potato | Tomato | apple | grape |
| LR | 0.925674 | 0.972695 | 0.898747 | 0.958204 | 0.949522 |
| LDA | 0.913341 | 0.957004 | 0.880643 | 0.950316 | 0.952911 |
| KNN | 0.917234 | 0.976761 | 0.936467 | 0.959001 | 0.959682 |
| CART | 0.920472 | 0.957585 | 0.859788 | 0.912857 | 0.912897 |
| RF | 0.953582 | 0.981405 | 0.971572 | 0.981071 | 0.976609 |
| NB | 0.893534 | 0.879698 | 0.628512 | 0.858833 | 0.870433 |
| SVM | 0.846477 | 0.883193 | 0.663616 | 0.633315 | 0.701443 |

# Conclusion

We can find, the RF method can provide best accuracy for those crops disease detection. KNN provides 2nd good accuracy for those crops disease detection except for corn’s. CART is worse for tomato’s 9 disease detection hints it might not suitable for multiclass classify. NB and SVM method give poor accuracy means they are not suit able in those crops disease detection. Besides, SVM is more time consume when the sample size increasing. (Please ask mum to check if this conclusion is correct)

Therefore, we would like to recommend the RF and KNN method as our favourite methods in those crop disease detection task.

The following diagram outlines the stages that results in a class prediction.