

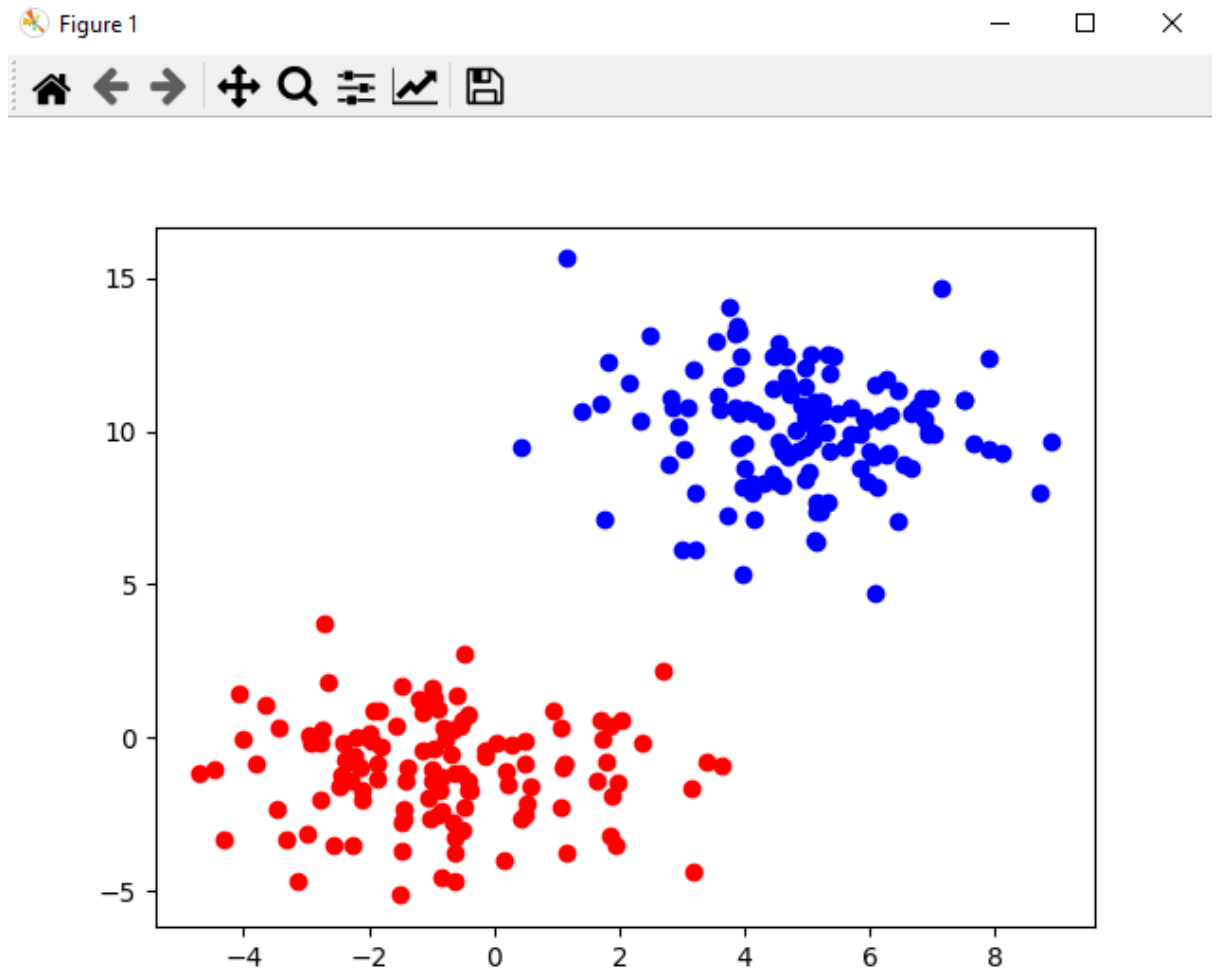
Leung Wang Fat

1155093445

CSCI 3320 Assignment 2

1.

Figures using train() function

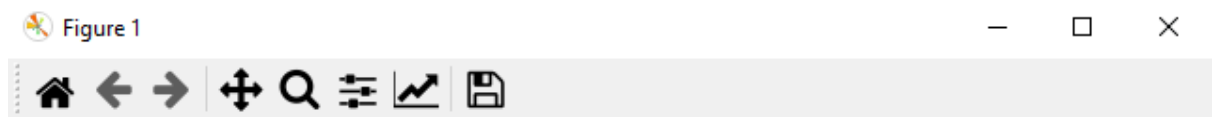


```
Connected to pydev debugger (build 202.7660.27)
C:/Users/hoho1/OneDrive - The Chinese University of Hong Kong/Year 5 sem 2/CSCI 3320/asg/3/ex1.py:15: RuntimeWarning: overflow encountered in double_scalars
  L = 1/(1+math.e**(-x))
Number of wrong predictions is: 0

Process finished with exit code 0
```

Number of wrong predictions is 0

Figures using train_matrix() function

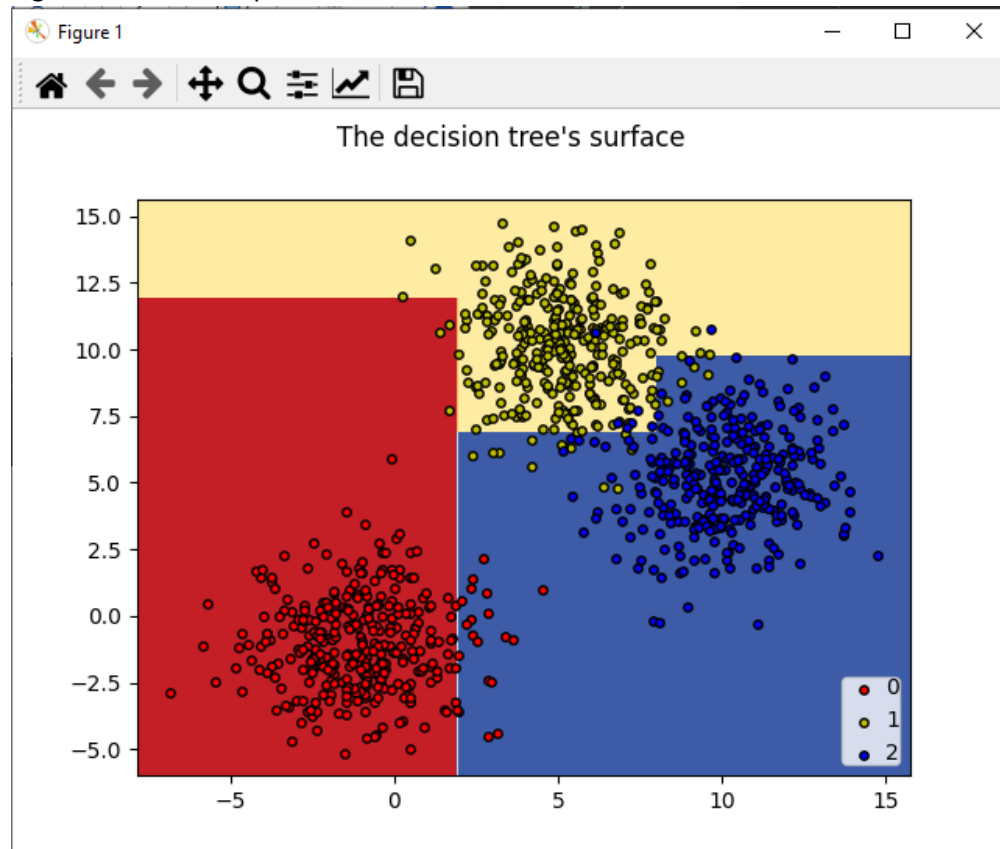


```
Connected to pydev debugger (build 202.7660.27)
C:/Users/hohol/OneDrive - The Chinese University of Hong Kong/Year 5 sem 2/CSCI 3320/asg/3/ex1.py:15: RuntimeWarning: overflow encountered in power
  L = 1/(1+math.e**(-x))
Number of wrong predictions is: 0
Process finished with exit code 0
```

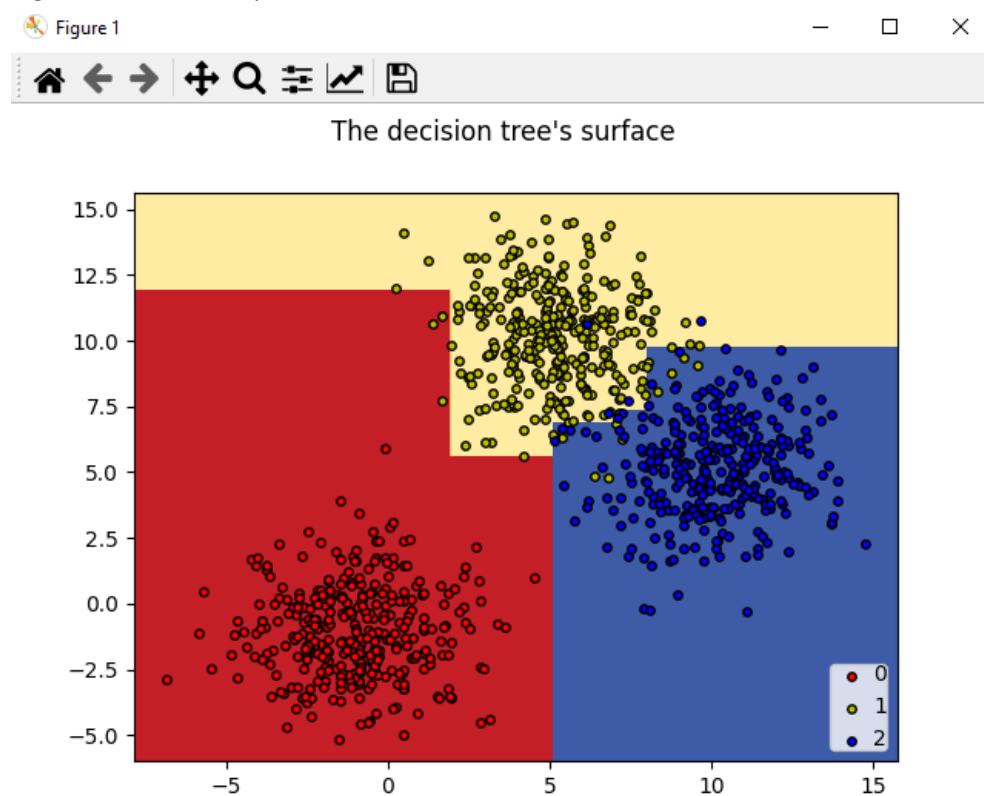
Number of wrong predictions is 0

2.

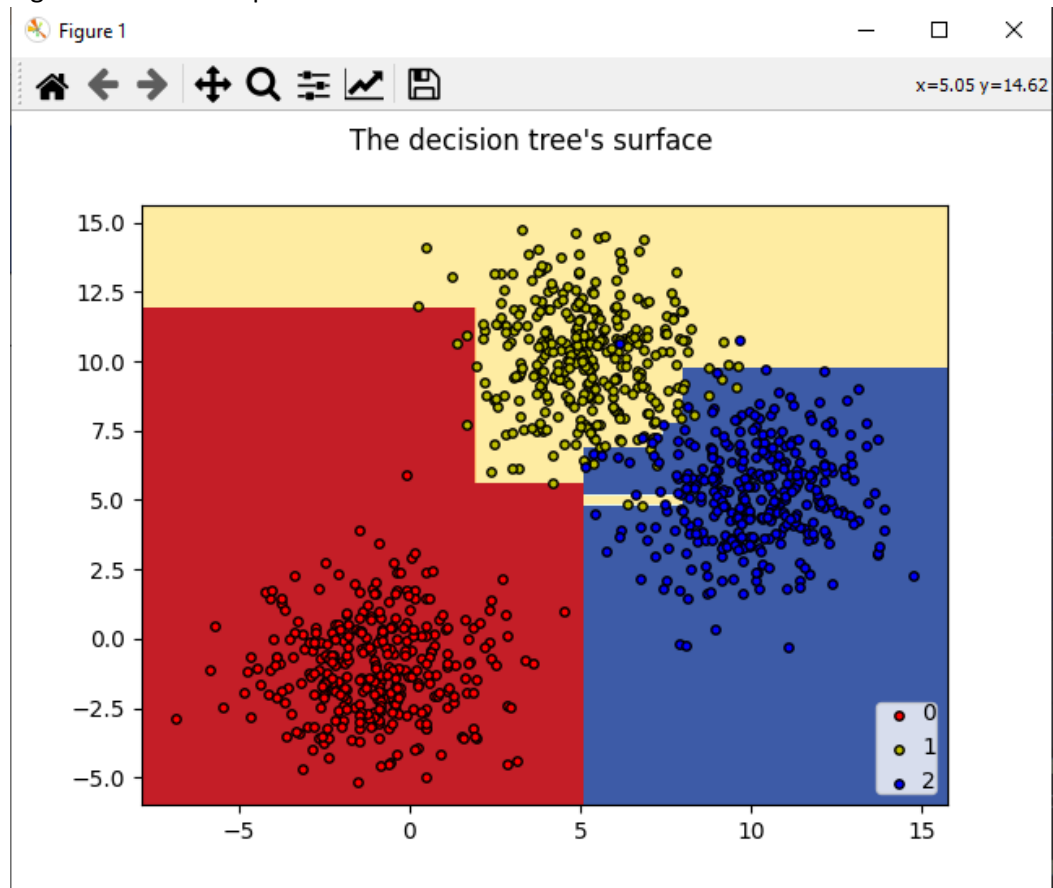
Figures when the depth is 3



Figures when the depth is 5



Figures when the depth is 7



Number of wrong predictions is: 10

Possible reasons for the result:

When the depth is 3. The depth of tree (which is proportional to the number of classification criteria) is not enough to classify the samples in the data with high precision, causing underfitting of the decision tree model. When the depth is 7. The depth of tree is too many to classify the samples in the data. More tight and small boundaries are set for the classification of data that belong to different classes, causing overfitting of the decision tree model. When the depth is 5. The number of classification criteria is enough for the data classification.