Assignment 2

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| --- | --- | --- | --- | --- | --- | --- |
| **Age** | **Spectacle** | **Astigmatism** | **Tear** | **Lenses (Ground Truth)** | **Prediction** | **Result** |
| Young | Hypermetrope | Yes | Normal | Yes | No | FN |
| Young | Hypermetrope | No | Normal | Yes | Yes | TP |
| Young | Myope | No | Reduced | No | No | TN |
| Presbyopic | Hypermetrope | No | Reduced | No | No | TN |
| Presbyopic | Myope | No | Normal | No | Yes | FP |
| Presbyopic | Myope | Yes | Reduced | No | No | TN |
| Prepresbyopic | Myope | Yes | Normal | Yes | Yes | TP |
| Prepresbyopic | Myope | No | Reduced | No | No | TN |



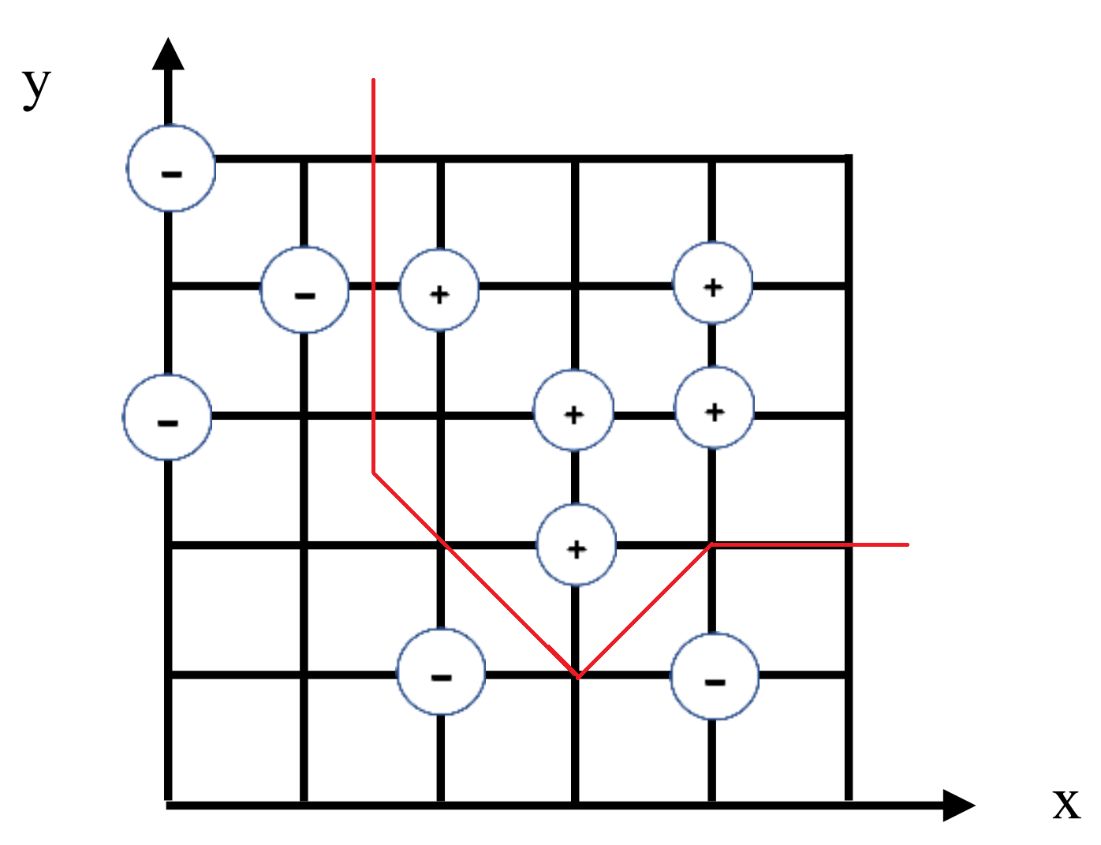
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|  |  |  |  |
| --- | --- | --- | --- |
| 1NN | | | |
| Location | Truth | Prediction | Result |
| (0,5) | negative | negative | TN |
| (0,3) | negative | negative | TN |
| (1,4) | negative | positive | FP |
| (2,4) | positive | negative | FN |
| (2,1) | negative | positive | FP |
| (3,3) | positive | positive | TP |
| (3,2) | positive | positive | TP |
| (4,4) | positive | positive | TP |
| (4,3) | positive | positive | TP |
| (4,1) | negative | positive | FP |

|  |  |  |  |
| --- | --- | --- | --- |
| 3NN | | | |
| Location | Truth | Prediction | Result |
| (0,5) | negative | negative | TN |
| (0,3) | negative | negative | TN |
| (1,4) | negative | negative | TN |
| (2,4) | positive | positive | TP |
| (2,1) | negative | positive | FP |
| (3,3) | positive | positive | TP |
| (3,2) | positive | positive | TP |
| (4,4) | positive | positive | TP |
| (4,3) | positive | positive | TP |
| (4,1) | negative | positive | FP |

|  |  |  |  |
| --- | --- | --- | --- |
| 9NN | | | |
| Location | Truth | Prediction | Result |
| (0,5) | negative | positive | FP |
| (0,3) | negative | positive | FP |
| (1,4) | negative | positive | FP |
| (2,4) | positive | negative | FN |
| (2,1) | negative | positive | FP |
| (3,3) | positive | negative | FN |
| (3,2) | positive | negative | FN |
| (4,4) | positive | negative | FN |
| (4,3) | positive | negative | FN |
| (4,1) | negative | positive | FP |

since there is an even amount of positive and negative, when using a positive for test then the majority of training data is negative and vice-versa for the negative test.



* 1. [Link](https://github.com/hgleos/CS4210-Machine-Learning/blob/main/Assignment%202/knn.py)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ID** | **Red** | **Green** | **Blue** | **Class** | **Distance to 10** |
| 8 | 176 | 224 | 23 | 3 | 39.674 |
| 5 | 107 | 142 | 35 | 2 | 80.019 |
| 4 | 144 | 238 | 144 | 2 | 100.125 |
| 3 | 250 | 128 | 14 | 1 | 128.222 |
| 6 | 46 | 139 | 87 | 2 | 131.867 |
| 2 | 255 | 99 | 21 | 1 | 149.258 |
| 7 | 64 | 224 | 208 | 3 | 182.825 |
| 1 | 220 | 20 | 60 | 1 | 196.675 |
| 9 | 100 | 149 | 237 | 3 | 202.536 |
| 10 | 154 | 205 | 50 | ????? |  |

The predicted class will be 2 based on 3NN.

Normalized: