Assignment3_ErenAkgunduz

February 4, 2024

1 Assignment 3

1.1 Eren Akgunduz

1.1.1 Deep Learning — 4 February 2024
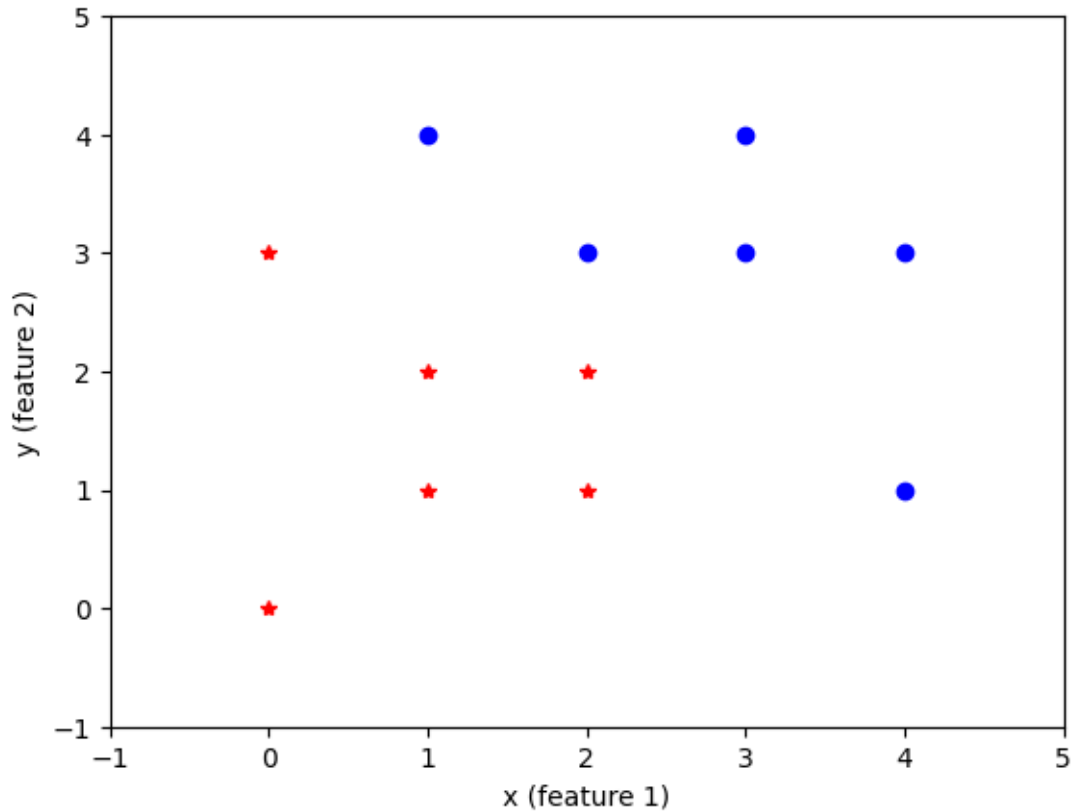
1.1.2 Link to notebook

```python
import numpy as np
import matplotlib.pyplot as plt
```

```python
c1 = np.array([[2, 3], [3, 3], [3, 4], [1, 4], [4, 1], [4, 3]], dtype=int)
c2 = np.array([[0, 0], [0, 3], [1, 1], [1, 2], [2, 1], [2, 2]], dtype=int)
```

```python
plt.plot(c1[:, 0], c1[:, 1], 'bo', label="Class 1")
plt.plot(c2[:, 0], c2[:, 1], 'r*', label="Class 2")

plt.axis([-1, 5, -1, 5])
plt.xlabel("x (feature 1)")
plt.ylabel("y (feature 2)")

plt.show()
```

```
[126]: def enter_threshold() -> tuple:
           print("Enter the threshold values, TH_x and TH_y")
           try:
               th_x = float(input("Enter the TH_x value: "))
               th_y = float(input("Enter the TH_y value: "))
               return th_x, th_y
           except ValueError:
               return "You must enter a valid number :)", "Try again"
```

```
[127]: def threshold_classifier(vals) -> tuple:
           print(vals)
           points = np.vstack((c1, c2))
           new_c1 = []
           new_c2 = []
           for point in points:
               if point[0] >= vals[0] and point[1] >= vals[1]:
                   new_c1.append(point)
               else:
                   new_c2.append(point)
           return np.array(new_c1, dtype=int), np.array(new_c2, dtype=int)
```

```python
[157]: def classifier_accuracy(new_classes) -> tuple:  # not working as expected yet
           correct_c1 = 0
           correct_c2 = 0
           for classified_c1 in new_classes[0]:
               if classified_c1 in c1:
                   correct_c1 += 1
           for classified_c2 in new_classes[1]:
               print(classified_c2)
               if classified_c2 in c2:
                   correct_c2 += 1
           return (correct_c1, correct_c2)
```

```python
[158]: def thr_plots():
           pass
```

```python
[159]: def main():
           vals = enter_threshold()
           if isinstance(vals[0], str):
               print(vals[0], vals[1])
               vals = enter_threshold()

           if not isinstance(vals[0], str):
               new_classes = threshold_classifier(vals)
               accuracies = classifier_accuracy(new_classes)
               print(new_classes)
               print(accuracies)
           else:
               raise TypeError("Valid number was not entered")
```

```python
[160]: main()
```

```
Enter the threshold values, TH_x and TH_y
Enter the TH_x value: 2
Enter the TH_y value: 3
(2.0, 3.0)
[1 4]
[4 1]
[0 0]
[0 3]
[1 1]
[1 2]
[2 1]
[2 2]
(array([[2, 3],
       [3, 3],
       [3, 4],
       [4, 3]]), array([[1, 4],
       [4, 1],
```

```
        [0, 0],
        [0, 3],
        [1, 1],
        [1, 2],
        [2, 1],
        [2, 2]]))
(4, 8)
```