KNN

April 7, 2025

[4]:
```python
# Dataset: [Car Age, Mileage, Fuel Type]
X = np.array([
    [3, 22000, 1],
    [6, 75000, 0],
    [2, 14000, 1],
    [8, 85000, 0],
    [4, 50000, 1]
], dtype=float)

# Target: Price Category (0 or 1)
y = np.array([1, 0, 1, 0, 1])
```

[6]:
```python
import numpy as np

def euclidean_distance(a, b):
    return np.sqrt(np.sum((a - b) ** 2))

def knn_predict(X_train, y_train, x_test, k=3):
    distances = [euclidean_distance(x_test, x_train) for x_train in X_train]
    k_indices = np.argsort(distances)[:k]
    k_nearest_labels = [y_train[i] for i in k_indices]
    return int(np.round(np.mean(k_nearest_labels)))

X_train = X[:3]
y_train = y[:3]
X_test = X[3:]
y_test = y[3:]

predictions = [knn_predict(X_train, y_train, x) for x in X_test]
accuracy = np.mean(predictions == y_test)
print("KNN Accuracy:", accuracy)
```

```
KNN Accuracy: 0.5
```