Algorithm 1 K-Nearest Neighbor Classification (K-NNC)

Require: Training dataset $D = \{(x_1, y_1), (x_2, y_2), ..., (x_n, y_n)\}$, test sample x, number of neighbors K

Ensure: Predicted label y for test sample x

1: **for** each training sample (x_i, y_i) in D **do**
2: Compute the Euclidean distance d_i between x and x_i
3: **end for**
4: Sort all distances in ascending order
5: Select the K training samples with the smallest distances
6: Count the frequency of each label among the K neighbors
7: Assign the label with the highest frequency to x
8: **return** predicted label y