The euclidean_distance(p, q) function computes the straight-line distance between two points p and q in multi-dimensional space. Both p and q are lists representing the coordinates of the points. The function checks that both points have the same number of dimensions, calculates the square of the differences between corresponding coordinates, sums these squared differences, and returns the square root of the sum, which is the Euclidean distance.

The k-nearest neighbors (k-NN) algorithm is then applied, where the Euclidean distance between a new data point and each point in the dataset is computed. The k closest neighbors are selected, and the new point is classified based on the most frequent class among these neighbors. This approach is widely used for classification due to its simplicity and effectiveness.

Once the nearest neighbors are identified, their classes are retrieved from the dataset. A dictionary (class_counts) tracks the occurrence of each class, and the max() function determines the most frequent class. The predicted class is then printed, using majority voting among the nearest neighbors. This process follows the core principle of the k-NN algorithm, which relies on similarity for prediction.