Explanations for solutions of question 1 and 2:

Time complexity Explanation for approach 1st vs 2nd:

Approach 1 algorithm takes O(m log m + n log n) time to sort and O(m + n) time to find the minimum difference. Therefore, the overall runtime is O(m log m + n log n)

Approach 2 uses Brute Force using two loops with Time Complexity O(n2).

Hence, Algorithm with approach 1 performs better.

Question 3:

What are the different tools such as code libraries or infrastructure that could help you find the smallest non-negative difference between 1 million lists that are 5,000 integers long?

Solutions to Question 3:

Numpy is a such a code library which can be used to find the smallest non-negative difference between 1 million lists that are 5,000 integers long.

We can also use scalable computation infrastructure such as AWS EMRs/EC2s for such purposes along with Spark Engine.