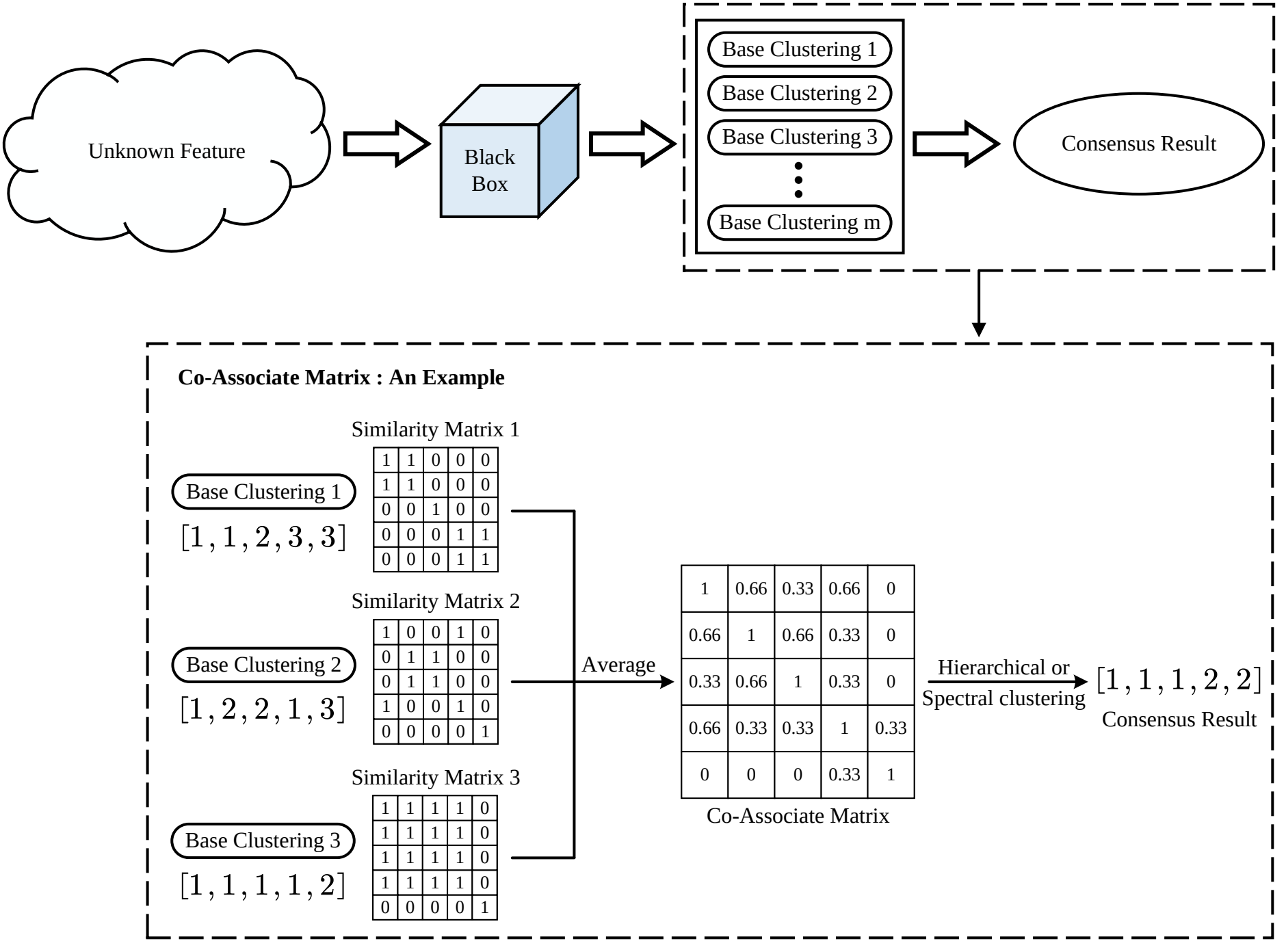

Figure 1. Flowchart of ensemble clustering. This flowchart briefly illustrates the process of ensemble clustering and provides a simple example to describe the basic Co-Associate matrix method. In this process, we have no knowledge of the original features of the data and only have discrete clustering results. For example, in the instance, we use the Co-Associate matrix method to obtain the final result from three clustering outcomes.

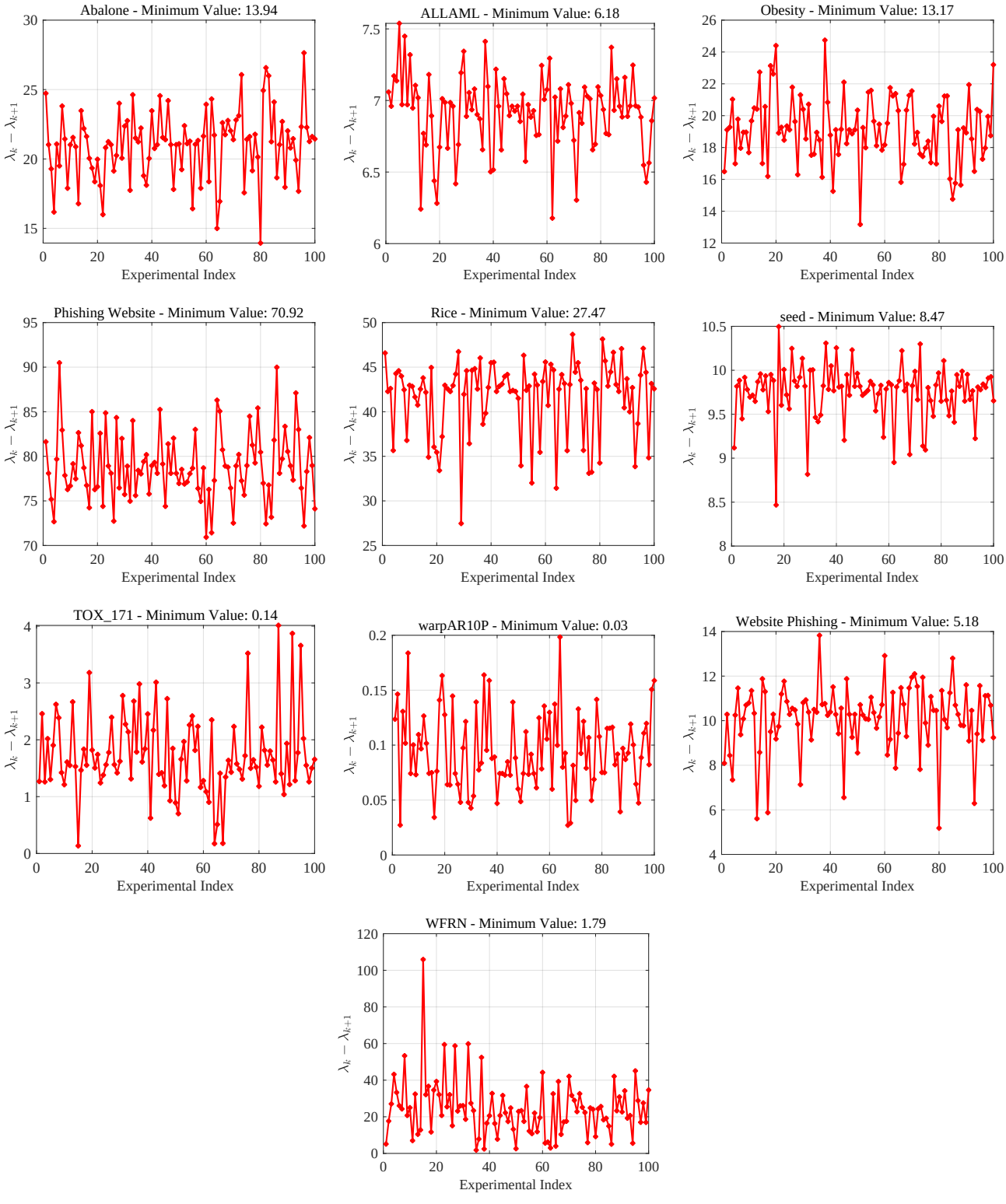

Figure 2. Verify whether the gap between the k-th largest eigenvalue and the $(k+1)$-th largest eigenvalue of $\mathbf{K}^*$ is greater than 0. For each dataset, we repeated the experiment 100 times. The y-axis represents the difference between the k-th largest eigenvalue and the $(k+1)$-th largest eigenvalue, while the x-axis represents the index of experiment. The "Minimum Value" above the plot indicates the minimum value of $\lambda_k - \lambda_{k+1}$ in the 100 experiments for that dataset. As shown, in a total of 1000 experiments, the gap between λ_k and λ_{k+1} never become 0.