

Q1a: Global outliers

A: Data that differ too greatly from other data are called global outliers.

For example, if the payment amount is excessively higher than usual, fraud can be suspected, and such transactions are global outliers.

Q1b: Contextual outliers

A: This is a case of detecting data anomalies depending on the situation.

For example, consumers who normally spend less than \$100 on food may spend a lot on food during the holiday season. This case cannot be regarded as fraud, but food expenses increase rapidly during non-holiday periods, it is a payment pattern that does not fit the situation, so it can be seen as a contextual outlier.

Q1c: Collective outliers

A: Data points that are not outliers as individual points can be outliers as a group.

For example, purchases of individual items are not unusual. But let's assume that you continue to purchase the item for a long period of time. If you see the purchase history of the same item as a group, you can suspect fraud, and in this case, it falls under Collective outliers.

Q2a: Clustering approach

A: Figure out the area where the length and weight of the cat are mainly distributed. In any case, data that deviate significantly from this distribution can be assumed to be animals other than cats.

Q2b: Classification approach

A: Train a model with the length and weight data of a typical cat. For example, after learning normal and abnormal using SVM, the model is used to determine whether the new data is normal (cat) or not normal (not cat).

Q EC: An application for outlier detection and address the challenges

A: 1. Fraud Detection - Attempts to identify theft by detecting changes in the behavior of the person holding the credit card. The same method is used for different types of scams.

2. Intrusion Detection - Some intrusions can be identified by observing systems and networks for unusual behavior.

3. Ecosystem Disturbances - Includes hurricanes, floods, droughts, heat waves and fires. The goal is to predict the likelihood of these events and their causes.

4. Medicine - In certain patients, abnormal symptoms or test results may indicate a potential health problem.