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**Question 1.**

1. Using the Airport KLX Table, describe an example that illustrates the insertion anomaly

A: When adding a new row to the table, we need to make sure that the information we are handling is consistent with existing rows. For example, if value “NULL” is added for any of the columns on the table, that will cause an insertion anomaly since none of the columns for this table should take in NULL as it’s value.

1. Using the AIRPORT KLX Table, describe an example that illustrates the deletion anomaly

A: Deletion anomaly is when there is a deleted record that may contain attributes that shouldn’t be deleted. For example, if Terminal A was to be deleted from the airline table, it will affect all the airlines that are assigned to Terminal A since airlines are assigned to one and only one terminal.

1. Using the AIRPORT KLX Table, describe an example that illustrates the modification anomaly

A: Modification anomaly is when incorrect data has been inserted and change must be made for the rows/tables/columns that contains the incorrect data. If new Terminal D opened but we added a terminal with terminal ID E, we would have to update all columns that lists Terminal E instead of D.

1. In the AIRPORT KLX Table, identify
2. Full (key) Functional Dependencies

A: AirlineID -> AirlineName

1. Partial (key) Functional Dependencies (if any)

A: Date -> NumberOfDepartingFlights

1. Transitive Functional Dependencies (if any)

A: Terminal ID -> NumberOfGates

1. Normalize AIRPORT KLX relation up to BCNF. (Explain every step of your normalization and finally list all relations that you getbecause of decompositions. Do not forget to mention functional dependencies )

A: First, I would normalize the relation by breaking down the AIRPORT KLX relation in to three tables. Airport KLX table with Date as primary key and Number of Departures attribute, Terminal table with Terminal ID as a primary key and number of gates as an attribute, and Airlines table with AirlineID as primary key and airline name as an attribute. For the relationship between the tables, there should be no transitive nor partial functional dependencies, but only full functional dependencies. Airport KLX table should be functionally dependant on Terminal and Airlines table and airlines table should be functionally dependant on Terminal table.

**Question 2.**