SCENERIO – 1

Question 1. What are the strengths and weaknesses of each option?

Option A:
Strengths: This option allows the instructor dimension to be included in the fact table, which will enable users to easily query the data for information about specific instructors. It also allows the grain of the fact table to remain at one row per student percourse, which will make it easy to aggregate data for analysis.

Weaknesses: This option requires the creation of special rows in the instructor dimension to represent instructor teams, which could make the dimension more complex and potentially harder to understand and use. Additionally, this option may not accurately represent the actual enrollment of each instructor, as the enrollment will be split equally among the instructors in a team.

Option B:
Strengths: This option allows for the inclusion of the instructor dimension in the fact table and enables accurate representation of enrollments for each instructor. It also allows for the possibility of querying data at the student-course-instructor grain, whichmay be useful for some analysis.

Weaknesses: This option requires changing the grain of the fact table to one row per student per course per instructor, which may make it more difficult to aggregate data foranalysis at higher levels. It also requires the use of fractional values in the Enrollment Count field, which may be confusing for users.

Option C:
Strengths: This option allows for the creation of two separate fact tables, one for general enrollment data and one for data at the student-course-instructor grain. This allows users to choose the appropriate fact table for their specific analysis needs andensures that the data is accurately represented in each table.

Weaknesses: This option requires the creation and maintenance of two separate fact tables, which may increase complexity and the burden on the warehouse. It may alsorequire users to remember to use the appropriate fact table for their queries, which could lead to errors or incorrect results if they use the wrong table.

Question 2. Which option would you choose and why?

Given the options presented, I would choose Option C. This option allows for the creation of two separate fact tables, one with the instructor dimension and one without, which enables users to choose the appropriate table for their analysis needs. This ensures that the data is accurately represented and avoids the need for special rows or fractional values in the fact table.

Question 3. Would your answer to Question 2 be different if the majority of classes had multiple instructors? How about if only one or two classes had multiple instructors? (Explain your answer.)

If the majority of classes had multiple instructors, I would still choose Option C. This option would allow for the creation of two separate fact tables that accurately representthe data for classes with single and multiple instructors.

If only one or two classes had multiple instructors, I may consider Option A or B as well.However, I would still ultimately choose Option C as it allows for the greatest flexibilityin querying and analysis, while still ensuring that the data is accurately represented.

Question 4. [OPTIONAL] Can you think of another reasonable alternative design besides Options A, B, and C? If so, what are the advantages and disadvantages of your alternative design?

An alternative design that could be considered is to include the Instructor dimension inthe fact table, but to

also include a separate column for instructor allocation, which would represent the fraction of the enrollment that each instructor is responsible for. This would allow for the inclusion of the instructor dimension in the fact table while still accurately representing enrollments for each instructor. However, this design may also increase the complexity of the fact table and could potentially be confusing for users.

SCENERIO – 2

Question 1. What are the strengths and weaknesses of each option?

Option A:
Strengths: This option allows for the scores to be stored as attributes of the Customer dimension, which will make it easy for users to filter or group by scores in their queries. It also avoids the need for additional dimensions or outrigger tables, which may simplifythe overall design of the warehouse.

Weaknesses: This option involves overwriting old scores with new scores when theychange, which means that the warehouse will not retain a history of changes to customer scores. This may make it difficult for users to understand how and why acustomer's score changes over time.

Option B:
Strengths: This option allows for the retention of a history of changes to customer scores, which may be useful for analysis and understanding how scores change over time. It also allows for the scores to be stored as attributes of the Customer dimension,which will make it easy for users to filter or group by scores in their queries.

Weaknesses: This option requires the creation of new Customer dimension rows each time a score changes, which may increase the complexity and size of the dimension. It may also make it more difficult for users to identify the current score for a customer, asthey will have to determine which row represents the most recent score.

Option C:
Strengths: This option allows for the scores to be stored in a separate CustomerScores dimension, which may make it easier for users to filter or group by scores in their queries. It also allows for the retention of a history of changes to customer scores, as the fact table includes a foreign key to the CustomerScores dimension rather than the scores themselves.

Weaknesses: This option requires the creation of a separate CustomerScores dimension with 45 rows, which may increase the complexity of the warehouse design. It also requires the use of foreign keys in the fact table, which may make it more difficult to perform certain types of analysis.

Option D:
Strengths: This option allows for the scores to be stored in an outrigger table, whichmay make it easier for users to filter or group by scores in their queries. It also allows for the retention of a history of changes to customer scores, as the Customer dimension includes a foreign key to the outrigger table rather than the scores themselves.

Weaknesses: This option requires the use of an outrigger table, which may increase thecomplexity of the warehouse design. It also requires the use of foreign keys in the Customer dimension, which may make it more difficult to perform certain types ofanalysis.

Question 2. Which option would you choose and why?

Given the options presented, I would choose Option B. This option allows for the retention of a history of changes to customer scores, which may be useful for analysisand understanding how scores change over time. It also allows for the scores to be stored as attributes of the Customer dimension, which will make it easy for users to filter or group by scores in their queries.

Question 3. Would your answer to Question 6 be different if the number of customers and/or the time interval between score recalculations was much larger or much smaller? (Explain your answer.)

If the number of customers or the time interval between score recalculations was much larger, I would still choose Option B. This option allows for the retention of a history of changes to customer scores, which may be more useful for analysis and understanding how scores change over time when dealing with a larger number of customers or more frequent score recalculations.

If the number of customers or the time interval between score recalculations was much smaller, I may consider Option A as well. In this case, the increased complexity and size of the Customer dimension associated with Option B may not be justified, as the number of changes to customer scores is likely to be much smaller.