CS412
HW2
Tianqi Wu

Question 1:

1. Each cell generates 2^d cells. Number of n nonempty base cells generate n*2^d cells in total. For maximum number of cells, consider all the attribute values are different and we only have (n - 1) common aggregate cells.

Hence, in total, we have n*2^d - (n-1) number of cells.

2. For minimum number of cells, consider each cell has d number of common attribute values. Then, the first base cell generates 2^d cells and rest of base cells have all the aggregate cells in common. Adding the (n - 1) number of base cells.

In total, we have 2^d + (n-1) number of cells.

Question 2:

Assume that all cuboids have been constructed before you perform the drill-down or slicing operations. V2 and V3 cannot be different since the only difference is the order of drill-down and slicing. Drill-down chooses the attribute for de-aggregation which introduces new dimensions. Slicing selects one or more dimensions based on the filter criterion. Slicing on a criterion can be done even if it is not drilled down yet. The two operations are done on V1 that shows the SUM of M, for the two possible values of A. Say V2 is obtained from drill-down on attribute B first and slicing on A. V3 is obtained from reverse order. Then, the results are the same.