Question 1

1. Among n nonempty cells in the base cuboid, for each dimension, if the value is distinct compared with the value in other cells (e.g: d=3, n=2, {a1, b1, c1}, {a2, b2, c2}) and no cells share any values in d dimension, we will get the max number of cells.

That is:

2. If all of the base cells only have different value in one dimension (e.g. d=3, n=2, {a1, b1, c1}, {a1, b1, c1}), we will get the minimum number of cells.

When I calculate the minimum, I use the previous max value minus the overlap cells of d-1 dimension.

That is:

Question 2

**V2 and V3 are same.**

Drill down is the process that let the user know more about its sub dimensions. And slice is the process that filter certain information of the dimension. I believe that they are independent process and they will not affect each other.

For instance, V1 is {A1/A2, B, C, D, \*}, and there are two cases:

1. When we drill down and slice the same dimension: If drill down B first, we get {A1/A2, B1/B2, C, D, M}, then slice B=0, we get {A1/A2, B1=0/B2=0, C, D, M}. On the other hand, if slice B=0 first, we get {a1/a2, B=0, C, D, M}, then dill down B, we get {A1/A2, B1=0/B2=0, C, D, M}. V2 and V3 are same.
2. When we drill down and slice the s dimension: If drill down B first, we get {A1/A2, B1/B2, C, D, M}, then slice C=0, we get {A1/A2, B1/B2, C=0, D, M}. On the other hand, if slice C=0 first, we get {a1/a2, B, C=0, D, M}, then dill down B, we get {A1/A2, B1/B2, C=0, D, M}. V2 and V3 are same.