## Chapter 5.7 Finishing Selection of Physics Query Plan

We already analyzed Query and convert it into Initialized Logical Query Plan, Through enlargement, we can use the same technology to Sort for Multi - Union, Multi - Intersection or Sort for random Combination or Exchange or Sort.

We need several steps to change Logic Plan into the whole Physical Query Plan. Here we still need to include several principal points:

1. In some early steps such as *Dynamic Programming Join Sequence*, and we has not selected the Algorithm, so we need to choose the *Execution Query Algorithm*.
2. For about when the Intermediate Result would be ***Materialized*** *( Materialized means to stored and saved in the Disk. )* and when it would be ***Pipeline Operation*** *( It only created in Main Memory and no need to be saved completely. )*
3. The comment for Physical Query Plan Operator, it needs to include the Access Detail to the Stored Relation and the related Algebra Operator Execution Detail.

In this chapter, we would not include all Operator Selection but only included two most important Operators: *Select and Join*. Whether to *Materialized* them or *Pipeline these Operators*. Also, we gives *Comments of Physical Query Plan*.

### Chapter 5.7.1 Select one Selection Method

The Most Important Step of Choosing one Physical Query Plan is to choose the Algorithm for each Selection Operator.

***Review:***

Before, we mentioned *Selection(c)( R ), which means to Select the Condition C and Check which tuple would satisfies the condition.* And after that we consider that Condition C would be Attribute equals to Constant and for this property we had the possibility to have one index. If so, we can find all tuples that satisfies Condition C, but no need to check all Relation R.

***Introduction:***

*Enlarge the question, and assume that we have one Selection Condition, it has several Conditions AND. Assume at least One Condition is the format of A Theta c, among which A is the Attribute With Index, c is Constant and one comparable Operator =, <, >.*

1. Each Physical Plan would use some attributes, which:
2. Has one Index.
3. Compare with one Constant.

After we use these indexes to identify the Tuple Collection which satisfies every condition. (We have discussed before that read the tuple from disk, how could we find all tuples that satisfy all conditions.)

For convenient, we consider the Algorithm limited to conditions below:

1. Consider the Index Scan Physical Operation, for those all tuples that satisfies the condition a) to query and get all tuples.
2. Consider each index in condition one and check whether it has satisfied the remained condition. This kind of physical Operation is called Filter.

Except this kind of Physical Plan, we still need to consider do not utilize any indexes, but it do read all Relations and pass every tuple to the Filter to check whether the condition is satisfied the plan or not.

What we need to do is to estimate the cost of each possible selection, and decide from all possible Physical Plan to decide which can be used.

### Chapter 5.7.2 Select Join Method

### Chapter 5.7.3 Pipeline Operation and Materialization

### Chapter 5.7.4 Unary Pipeline Operation

### Chapter 5.7.5 Pipeline Operation of Binary Operators

### Chapter 5.7.6 Sign used for Physics Query Plan

### Chapter 5.7.7 Sort of Physics Operator