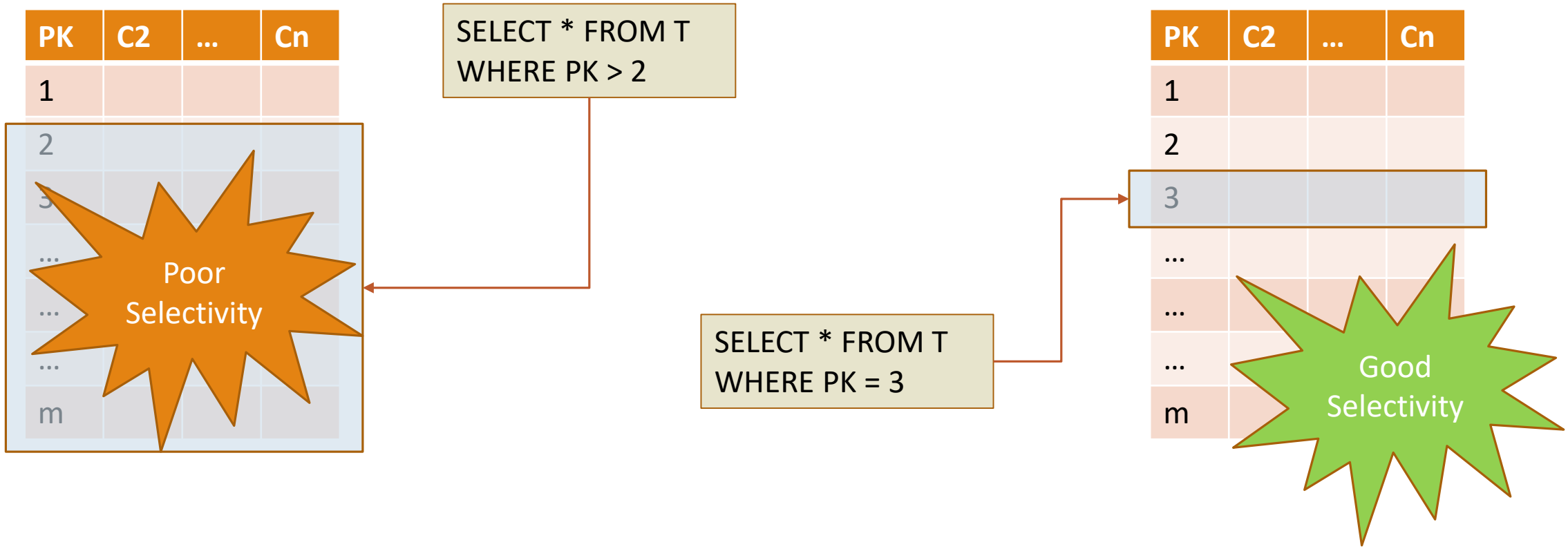
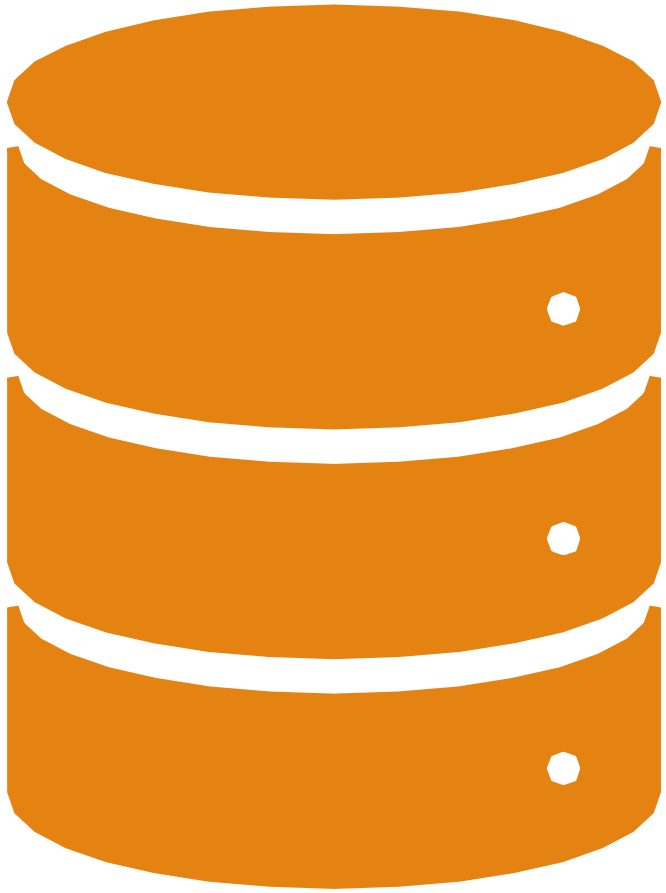
Oracle Performance Tuning

WEEK 7

SQL Filter Selectivity





SQL Access Paths

The most known paths to access the data:

- The FULL TABLE SCAN access
- Access through indexes

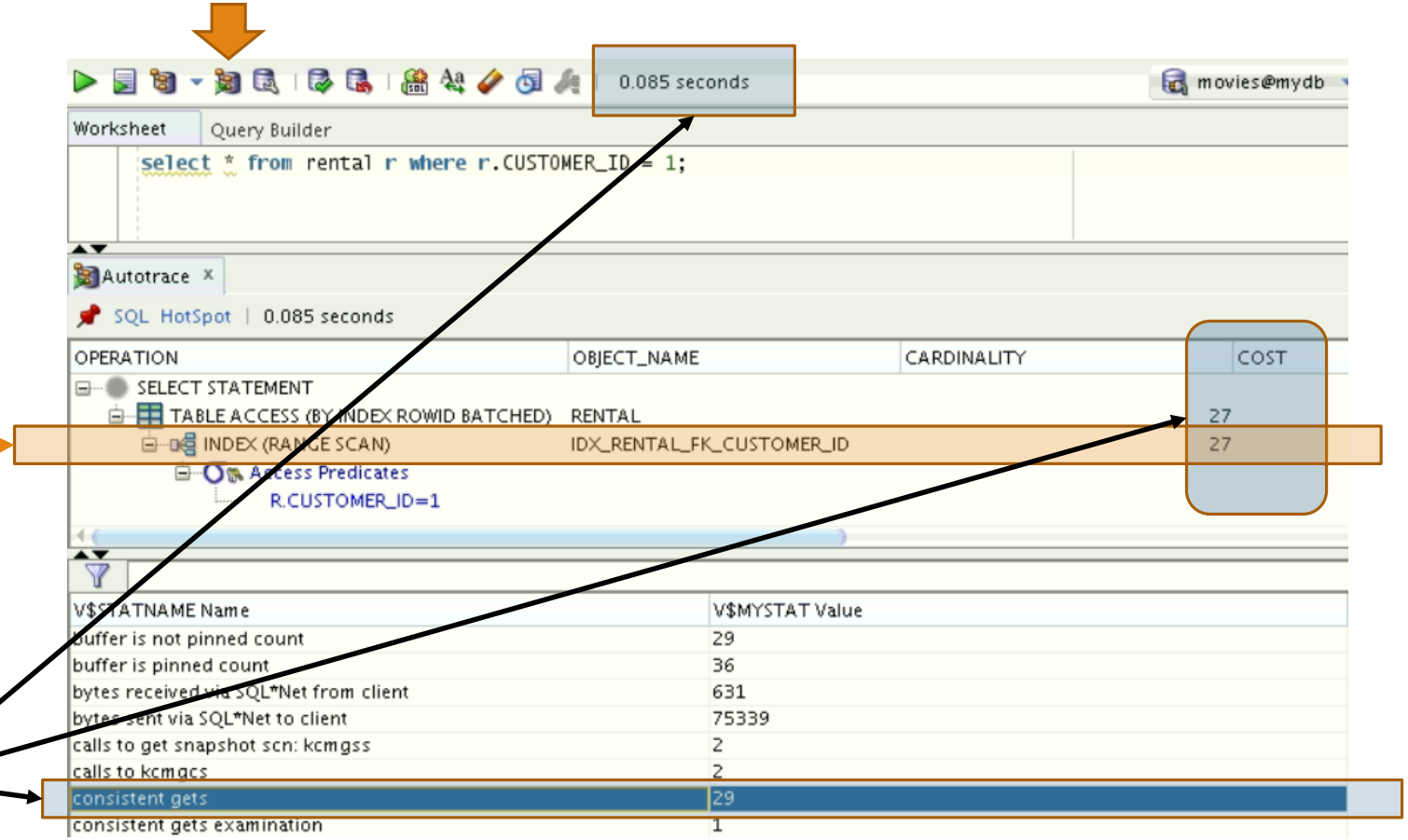
How Do We Know How Oracle Executes our Queries?

Getting and Interpreting the Exec Plan (the easy way)

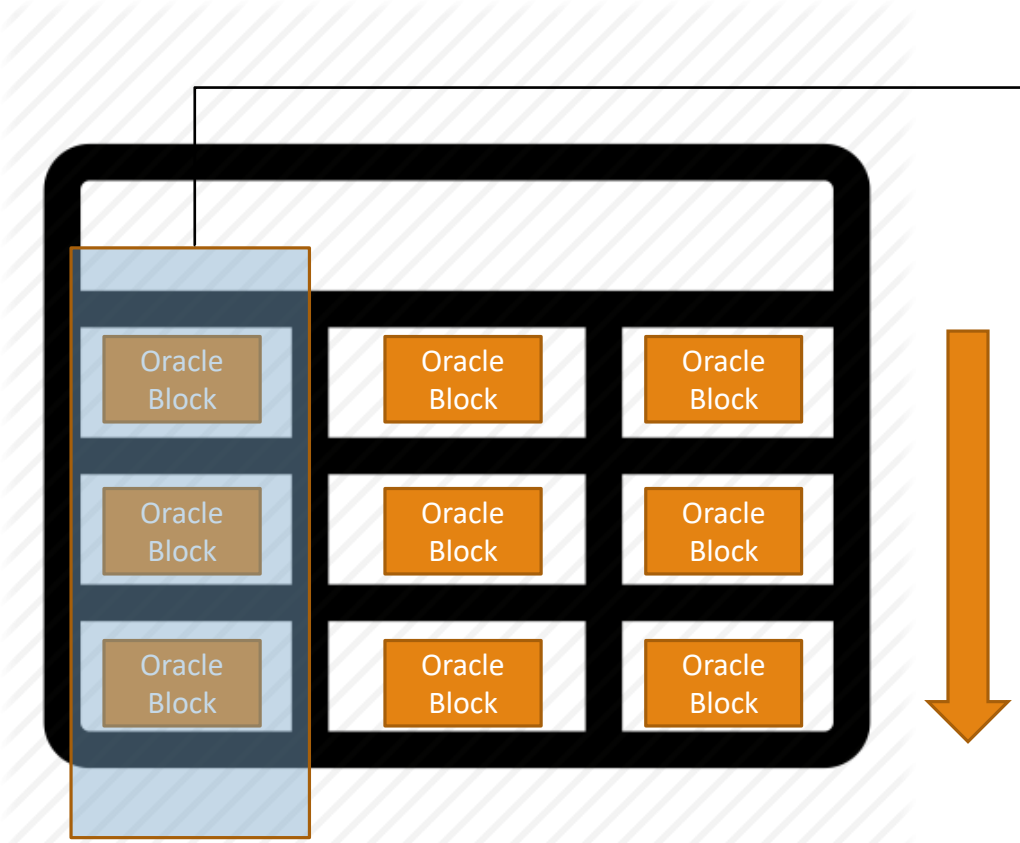
Required privilege:
GRANT SELECT ANY DICTIONARY TO ….

Access path

Tuning Goal Metric
Objective: **MINIMIZE**



The FULL TABLE SCAN



DB_FILE_MULTIBLOCK_READ_COUNT

Inspect each and every block under the HVM of the target table.

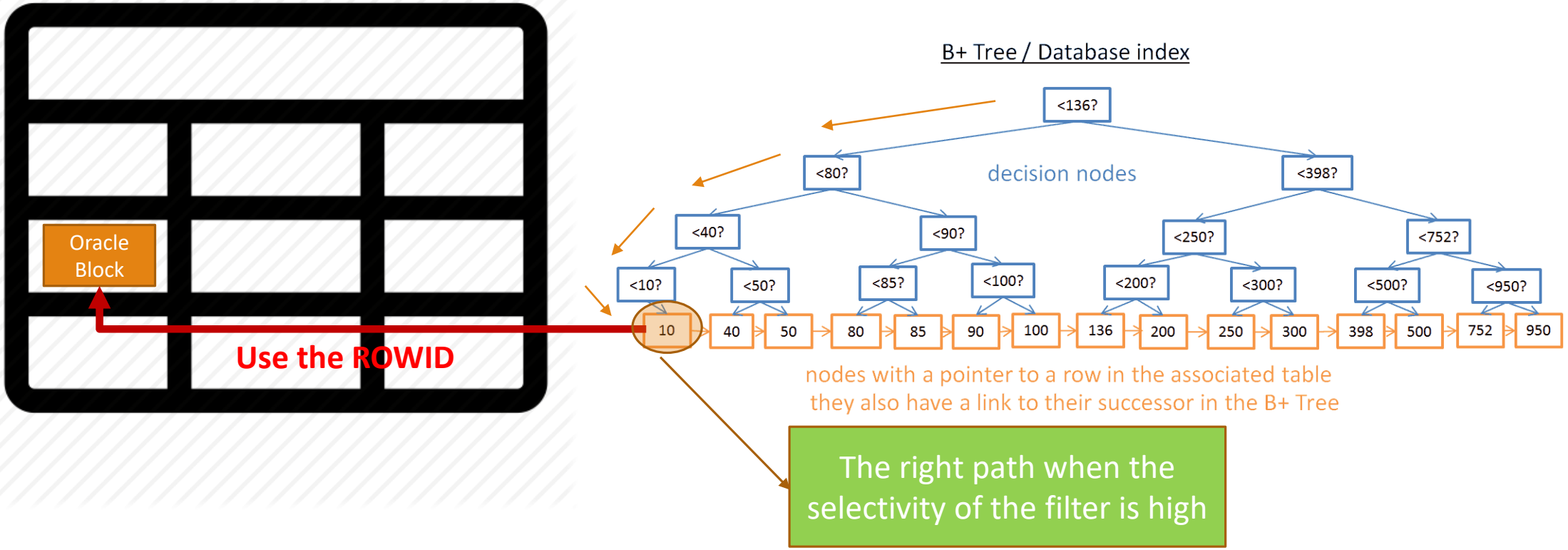
The right path when the selectivity of the filter is low

Tuning Full Table Scans

Tweak	• Tweak the `db_file_multiblock_read_count` parameter
Parallelism	• Use parallelism if you are on Enterprise Edition
Partition	• Partition the table if you bought the partitioning option
Caching	• Ensure “hot” data is in memory
Compression	• Do less IOs on compressed segements

B-TREE INDEX Access

```
SELECT * FROM RENTAL WHERE CUSTOMER_ID = :1;
```



BITMAP Indexes

CREATE BITMAP INDEX <INDEX_NAME> ON TABLE(SEX);

RowID	Sex		
R_1	F	..	..
R_2	M	..	..
R_3	F	..	..
R_4	F	..	..
R_5	M	..	..
R_6	F	..	..
R_7	F	..	..

	R_1	R_2	R_3	R_4	R_5	R_6	R_7
F	1	0	1	1	0	1	1
M	0	1	0	0	1	0	0

Low distinct cardinality for the indexed column

Low changes on the indexed column or underlying table

Not recommended for OLTP systems

In OLAP/DW systems they can be used to improve the performance of the star schema design

When to choose BITMAP Index?

1

B-Tree: CREATE INDEX name ON table(col)

2

Bitmap: CREATE BITMAP INDEX name ON table(col)

3

Functional: CREATE INDEX name on table(func(col))

4

Composite: CREATE INDEX name ON table(col1, col2, …)

Indexes Types

Index or Full Table Scan?

Some Indexes Facts

A B-Tree index doesn't store NULL values.

In most of the cases, a function applied on an indexed column invalidates the usage of that index.

If compound indexes are involved and just one column is used in an SQL filter, the best would be that column to be the leading one in the index definition.

Pay attention to the LIKE filters: SELECT * FROM EMP WHERE Name LIKE 'Gogu%' is using the index, but LIKE '%Gogu' is not.

Avoid SELECT * statements when you want just one or a few columns in order to increase the chances the query to be honored from the index definition only.

It's a good practice to index the foreign key columns (JOINs optimization, less LOCKs).

Hands-on Practice

On the MOVIES schema, you need to optimize the following query:

```
SELECT COUNT(*)
FROM RENTAL
WHERE TRUNC(RETURN_DATE) = TO_DATE('30/05/2005', 'dd/mm/yyyy');
```

Look at the data, generate the execution plan and implement an optimization solution for the above query.

Other SQL Tuning Methods

Clustered tables

Materialized Views

Optimizer Hints

Quiz Time

Challenge your Oracle tuning knowledge with these 10 questions!

https://play.kahoot.it

That’s all folks!

THANK YOU AND SEE YOU NEXT WEEK…