| **Group:** | **89** | **Lab User** | **286** |
| --- | --- | --- | --- |
| **Student:** | **Alberto Pascau Sáez** | **NIA:** | **100495775** |
| **Student:** | **Silvia Bayo Martínez** | **NIA:** | **100495811** |
| **Student:** | **Carmen Serrano Pérez** | **NIA:** | **100495711** |

# Introduction

It will consist of an introductory paragraph, analyzing the problem to be solved.

Expose initial state: physic design, and prototypic workload (frequent processes) composition and cost. State the goal and summarize the steps you are about to follow for attaining it.

# Analysis

*Describe the setting: the current (initial) physical design and the prototypical workload (frequent processes). Add a screenshot with the (initial) average cost of the workload.*

*For each sentence in the workload (each query) find out, explain, and analyze the execution plan and basic statistics (focusing on consistent gets and timing). Point out the weaknesses and strengths of the initial physical design according to the needs of your specific problem (the workload). Incorporate screenshots of performance as you deem appropriate.*

*Propose improvements to the physical design based on the analysis of each instruction run individually, and comment on the expected benefits and the drawbacks that it could bring about on the global system (if any).*

## Output of the RUN\_TEST PROCEDURE

The run test procedure was run with 10 as the input for the number of iterations. The result obtained was:

begin

2 pKG\_COSTES.RUN\_TEST(10);

3 end;

4 /

Iteration 1

Iteration 2

Iteration 3

Iteration 4

Iteration 5

Iteration 6

Iteration 7

Iteration 8

Iteration 9

Iteration 10

RESULTS AT 23/04/2025 17:41:45

TIME CONSUMPTION (run): 1069.1 milliseconds.

CONSISTENT GETS (workload):60493 acc

CONSISTENT GETS (weighted average):6049.3 acc

PL/SQL procedure successfully completed.



From this output we can analyse two important pieces of information.

1. The time consumption for the tests was of: **1069.1 milliseconds**
2. The consistent gets (weighted average) had: **6049.3 acc**

After developing all optimizations the tests will be run again to check if the development made any change (we hope so) and analyse the quantity of that change.

## QUERY 1: Analisis

Given the first query:

select \* from editions where pub\_place='…'; -- values like 'Madrid', 'Segovia', or 'Barataria', to name a few examples



We’ll perform an initial analysis by setting the autotrace and executing queries for Madrid and Segovia.

SQL> select \* from editions where pub\_place='Madrid';

82450 rows selected.

Execution Plan

----------------------------------------------------------

Plan hash value: 1741989577

------------------------------------------------------------------------------

| Id | Operation | Name | Rows | Bytes | Cost (%CPU)| Time |

------------------------------------------------------------------------------

| 0 | SELECT STATEMENT | | 89905 | 84M| 2055 (1)| 00:00:01 |

|\* 1 | TABLE ACCESS FULL| EDITIONS | 89905 | 84M| 2055 (1)| 00:00:01 |

------------------------------------------------------------------------------

Predicate Information (identified by operation id):

---------------------------------------------------

1 - filter("PUB\_PLACE"='Madrid')

Note

-----

- dynamic statistics used: dynamic sampling (level=2)

Statistics

----------------------------------------------------------

42 recursive calls

88 db block gets

13125 consistent gets

7688 physical reads

16888 redo size

17923108 bytes sent via SQL\*Net to client

60829 bytes received via SQL\*Net from client

5498 SQL\*Net roundtrips to/from client

0 sorts (memory)

0 sorts (disk)

82450 rows processed

SQL>

SQL> select \* from editions where pub\_place='Segovia';

71 rows selected.

Execution Plan

----------------------------------------------------------

Plan hash value: 1741989577

------------------------------------------------------------------------------

| Id | Operation | Name | Rows | Bytes | Cost (%CPU)| Time |

------------------------------------------------------------------------------

| 0 | SELECT STATEMENT | | 83 | 82087 | 2054 (1)| 00:00:01 |

|\* 1 | TABLE ACCESS FULL| EDITIONS | 83 | 82087 | 2054 (1)| 00:00:01 |

------------------------------------------------------------------------------

Predicate Information (identified by operation id):

---------------------------------------------------

1 - filter("PUB\_PLACE"='Segovia')

Note

-----

- dynamic statistics used: dynamic sampling (level=2)

Statistics

----------------------------------------------------------

6 recursive calls

2 db block gets

7649 consistent gets

7553 physical reads

0 redo size

16787 bytes sent via SQL\*Net to client

418 bytes received via SQL\*Net from client

6 SQL\*Net roundtrips to/from client

0 sorts (memory)

0 sorts (disk)

71 rows processed

SQL>



We can see that the autotrace shows us a lot of data, from this data, the important output we focus on is the number of reads and consistent gets for each query:

* **MADRID:** 13125 consistent gets ; 7688 physical reads
* **SEGOVIA:** 7649 consistent gets ; 7553 physical reads

We can also use the following query to see the data of all tables to see the editions data, this analysis will also be useful for

## QUERY 2: Analisis

## QUERY 3: Analisis

## QUERY 4:Analisis

Given the fourth query:

select \* from editions;

We’ll perform the analisis with the autotrace. Besides, we’ll also use the output of last part of the analysis performed for the first query

# Physical Design

Following the analysis done in the previous section, settle a complete physical design of the whole DB (at least one, yet you can propose several alternatives). Improvements may include changes in base organizations (hashing, clustering), auxiliary organizations (indexes), redundancies (immediately refreshed materialized views), DB block (bucket) parameters, etc.

Notice that some improvements aimed at improving a given part of the workload could worsen other operations. Justify every design decision.

# Evaluation

You have measured the performance of the initial physical design and stated it. After implementing your improved physical design and measured the new performance, compare both and analyze the results obtained (comment divergences with expected results). Add screenshots for backing your evaluation.

# Concluding Remarks

Firstly, make conclusions on the work and the results obtained. Reflex on (defend or criticize) the achieved result (if you think it is good, explain why).

After stating your results, comment on your achievement through this *labwork*, and all assignments in general: required effort, knowledge gain, progress, etc. You can also propose improvements for further editions (focus, size of the problem, requested items, deadlines, supporting materials, etc.). Finally, you can add comments on the whole course (lacks in the syllabus, issues you would like to study more deeply, non-useful issues, etc.).