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| **Group:** | **308** | **Lab User** | **fsdb308** |
| **Student:** | **Siro Brotón Gutierrez** | **NIA:** | **100496683** |
| **Student:** | **Yan Chen Zhou** | **NIA:** | **100496757** |
| **Student:** | **Ivan Ocheretianyi** | **NIA:** | **100487317** |

# Introduction (~more or less)

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.

Our task is to implement a new physical design into the existing database so that it optimizes the speed of the retrieval and modification of data. However, our team will focus on optimizing a few selections of operations. An exhaustive analysis of the frequency of each query has already been carried out, indicating that the following **four queries**:

1. select \* from editions where pub\_place='…';
2. select \* from editions where publisher='…';
3. select \* from copies where condition='…';
4. select \* from editions;

are the most important operations performed in our database. It follows a proportion of 30%, 30%, 30% and 10% respectively. To improve their performance, we will use the workloads provided by the package *PKG\_COSTES* and their statistics as the main metric to improve the physical design of our database.

# Analysis (x)

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).

All tables defined in the database has the default settings on its physical design: a serial non-consecutive using indexes on PKs with BS of 8KB, pctfree of 10% and pctused of 60%. Our initial test run of the workloads returns the following results.

SCREEN SHOT OF WORKLOAD

# Physical Design (x)

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 (x)

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 (x)

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.).