

# Developing a Dynamic Visualization of The Oracle Query Execution Process



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## Background

- ❖ Query execution for any Database Management System (DBMS) is a complicated process.
- ❖ A general understanding of the query execution process is essential for writing efficient queries.
- ❖ The execution of a query in Oracle consists of a series of steps involving different areas of memory and disk.
- ❖ Members of our group had developed an application to visually simulate the execution process for certain SQL (Structured Query Language) statements executed against an Oracle DBMS.
- ❖ As an extension to this project we have expanded the previous simulator to include functionality for dynamic interaction with an instance of the Oracle DBMS.
- ❖ By interacting with an Oracle DBMS instance through JDBC (Java Database Connectivity), the simulator provides information about the execution process for user generated queries.



## Execution Plan

- ❖ SQL statements are generated by users and are used to retrieve information from or add information to an Oracle database.
- ❖ For each statement Oracle generates an execution plan which determines in which manner the information is to be accessed or written.
- ❖ This plan for execution is accessed from the plan table and displayed to the user in our application.

OPERATION	OBJECT_NAME
SELECT STATEMENT	
NESTED LOOPS SEMI	
TABLE ACCESS FULL	CREATURES
INDEX RANGE SCAN	SYS_C0010573

## Executable Search

- ❖ The V\$SQL view contains information on when an SQL statement is loaded, and is queried to discover whether or not an executable version of the statement is present.
- ❖ This information is displayed to the user as shown as well as being reflected in the process steps.



## Data Dictionary Search

- ❖ The V\$SQL\_PLAN\_STATISTICS view contains information regarding the execution statistics of an SQL statement.
- ❖ These statistics are then used to create a summary regarding the location of the data being manipulated by the SQL statement.

OPERATION	OPTIONS	OBJECT_NAME	BUFFER GETS	ROWS	DISK WRITES	DISK READS
NESTED LOOPS SEMI			9	8	0	0
TABLE ACCESS FULL		CREATURES	7	11	0	0
INDEX RANGE SCAN		SYS_C0010573	2	8	0	0

## Retrieved Results

- ❖ For SELECT statements, the results of the issued statements are displayed.
- ❖ For INSERT, UPDATE, or DELETE statements, the number of rows affected by the statement are displayed.

CREATURE_ID	CREATURE_NAME	CREATURE_TYPE	RESIDE_STATE	SALARY
1	hello	world	WI	10
3	Dougherty	person	IA	62000
2	Myers	person	WI	65000
4	Neff	person	MINN	70000
6	Carlis	person	MINN	50000
7	Kermit	frog	VA	45000
5	Mieska	person	PA	45000
8	Oodzilla	monster	NY	100000

## Future Work

- ❖ Future work can be done to include dynamic information about query execution on a per component basis instead of a process related basis, such as displaying the contents of redo logs or the optimizer mode.

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