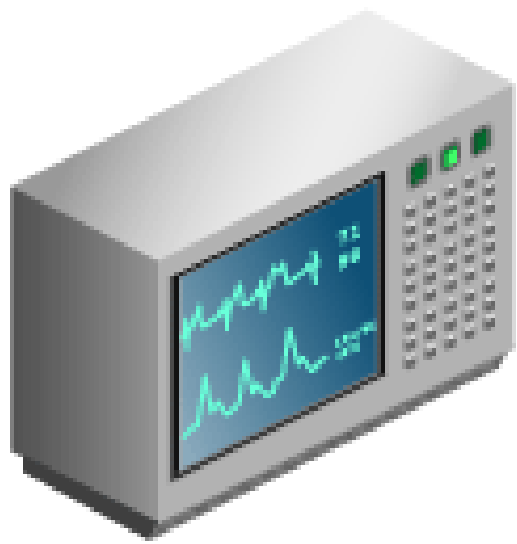
Administration and Monitoring the Database

Oracle 10g

Monitoring the Database

- When problems occur with a system, it is important to perform accurate and timely diagnosis of the problems before making any changes to the system. Often a database administrator simply looks at the symptoms and immediately starts changing the system to fix those symptoms.



Monitoring Performance Issues

- Oracle Database XE enables you to monitor the following performance statistics.

1)- Session information: A session is the connection of a user to an Oracle database instance. A session lasts from the time the user connects until the time the user disconnects or exits the database application.

2) System Statistics page displays statistics for:

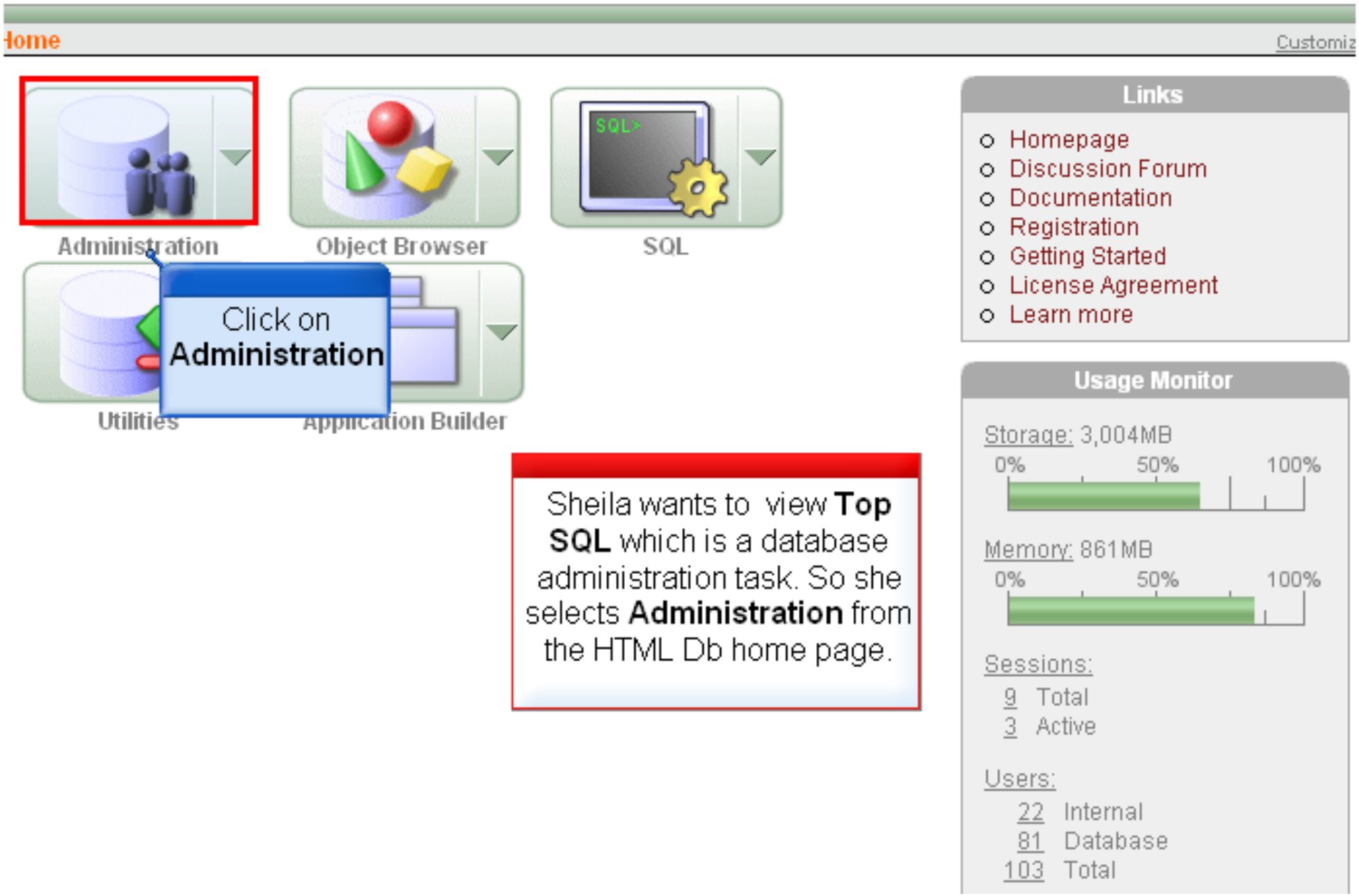
- Physical I/O
- Logical I/O
- Memory
- Time
- SQL cursor
- Transaction

2)- Top SQL: The "top" SQL statements represent the SQL statements that are executed most often, that use more system resources than other SQL statements, or that use system resources more frequently than other SQL statements.

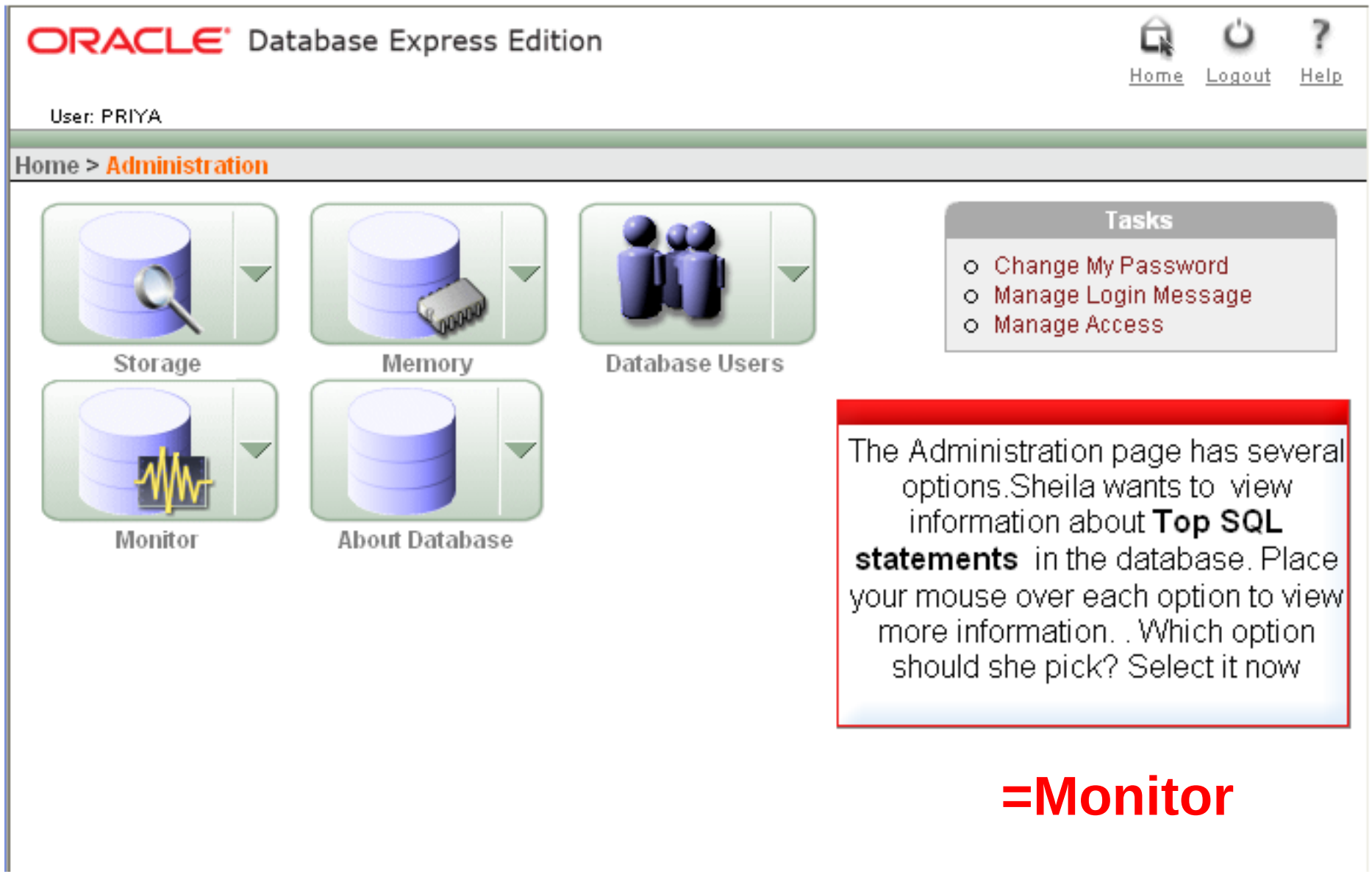
3)- Long operations: The Long Operations page displays the status of various operations that run for longer than six seconds (in absolute time). These operations currently include many backup and recovery functions, statistics gathering, and query execution. More operations are added for every Oracle release.

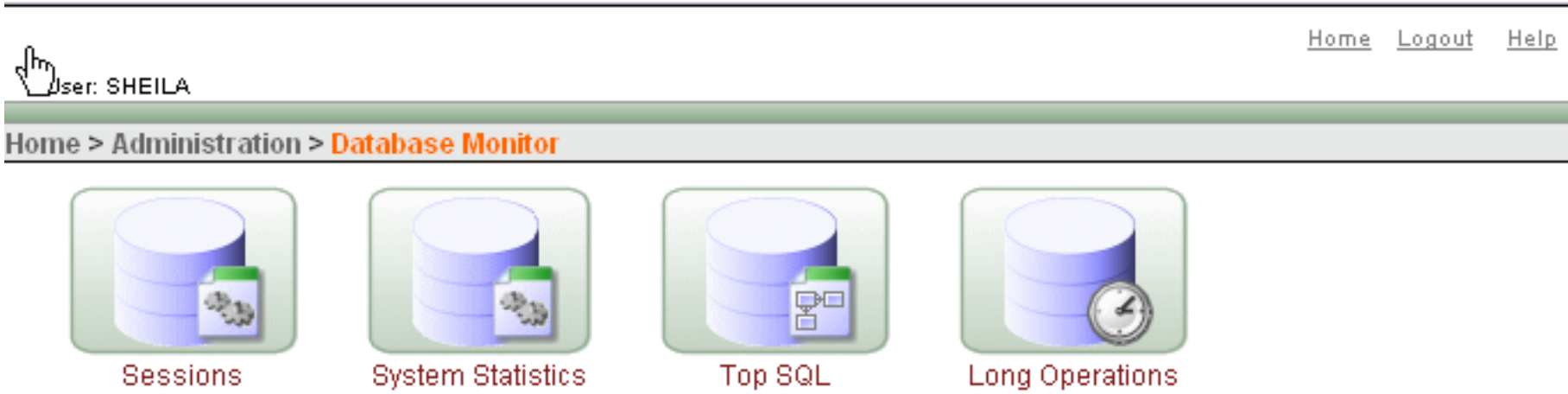
Viewing Top SQL

- Management has been complaining about slow-running reports. Sheila wants to see which SQL statements are using the most resources and then view their execution plans. She uses the Top SQL page under Monitor to do this.

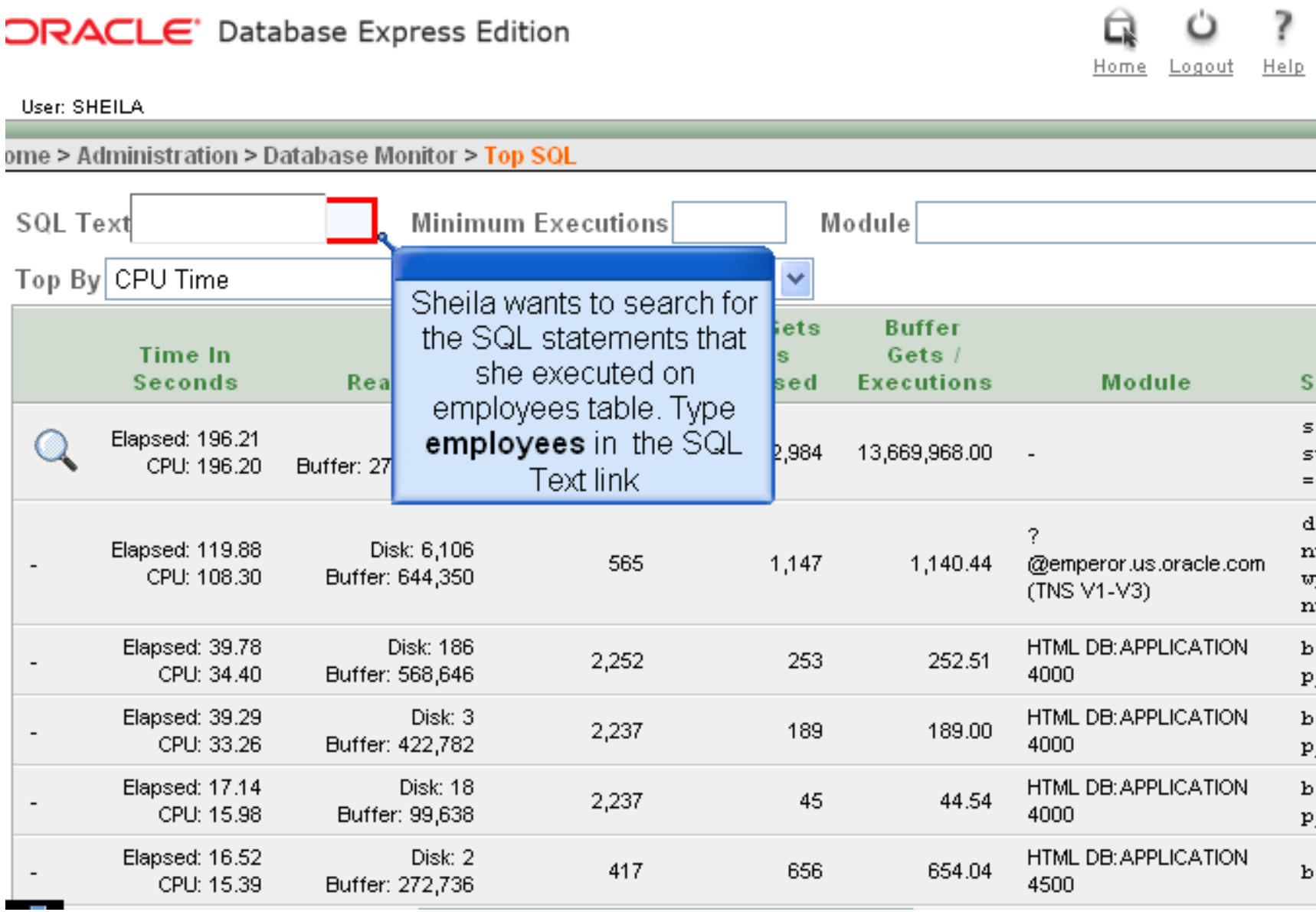


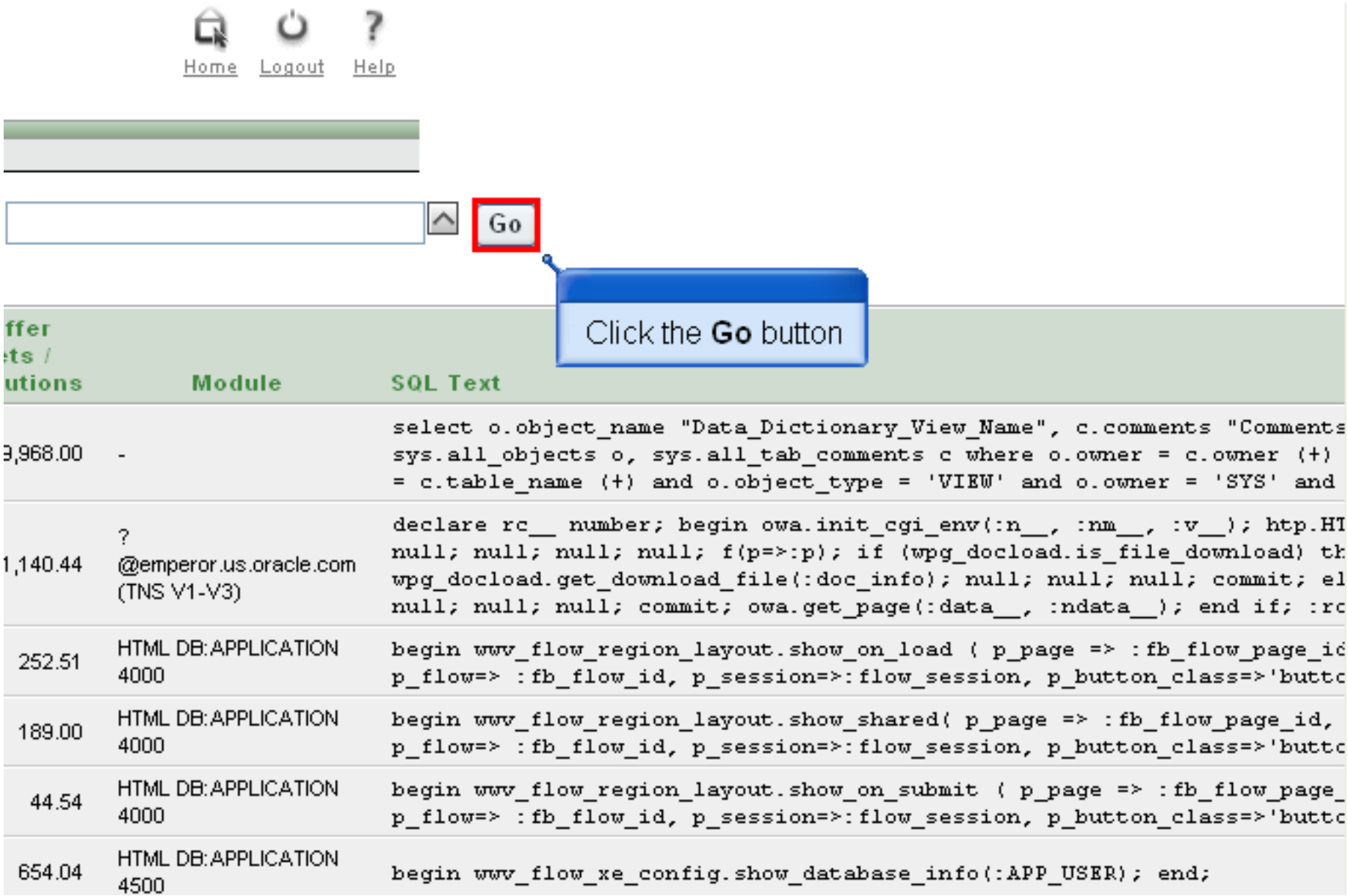
Sheila wants to view **Top SQL** which is a database administration task. So she selects **Administration** from the HTML Db home page.

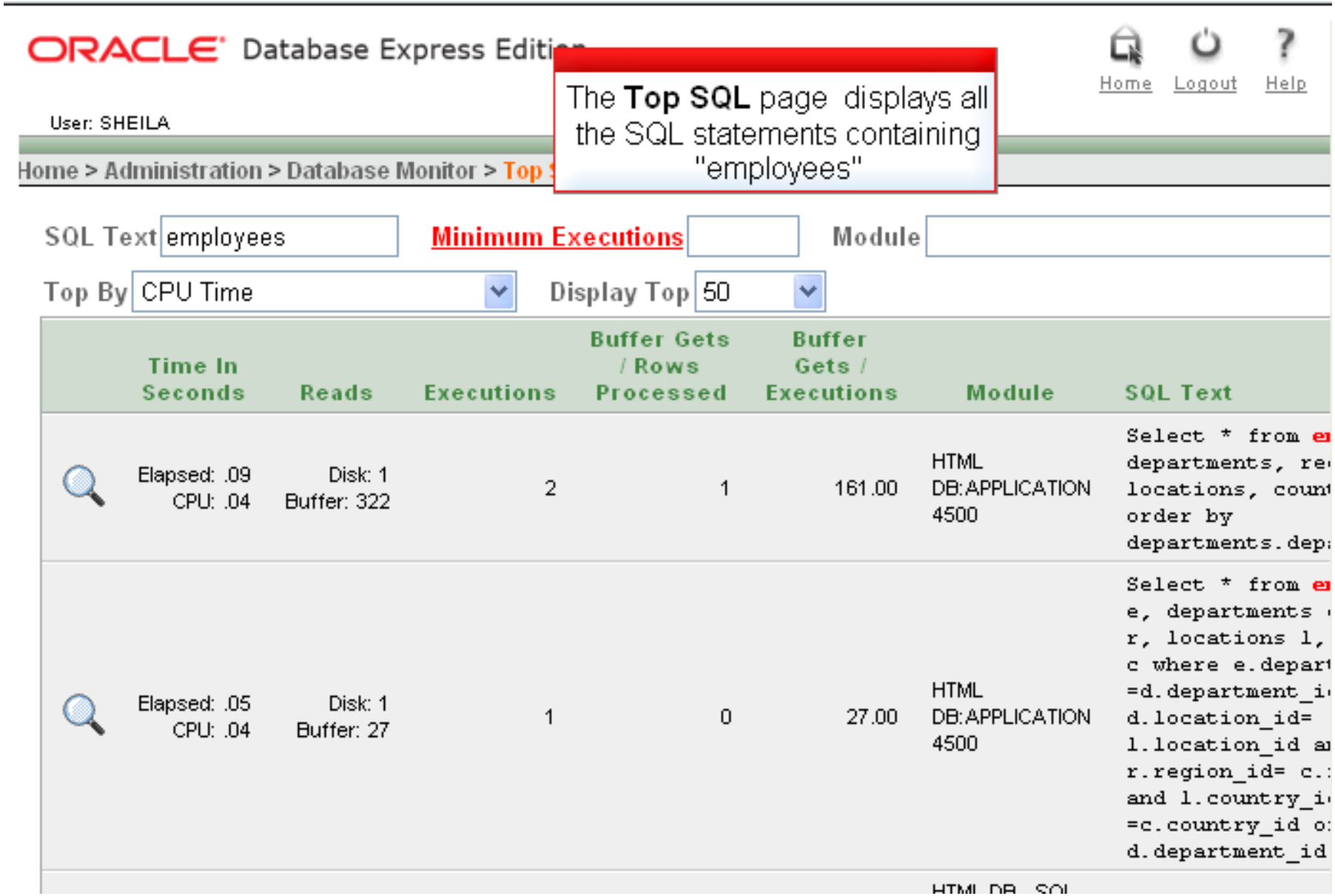

ORACLE Database Express Edition
Home
Logout
Help
User: PRIYA
Home > Administration
Storage
Memory
Database Users
Monitor
About Database
Tasks
Change My Password
Manage Login Message
Manage Access
The Administration page has several options.Sheila wants to view information about Top SQL statements in the database. Place your mouse over each option to view more information. . Which option should she pick? Select it now
=Monitor

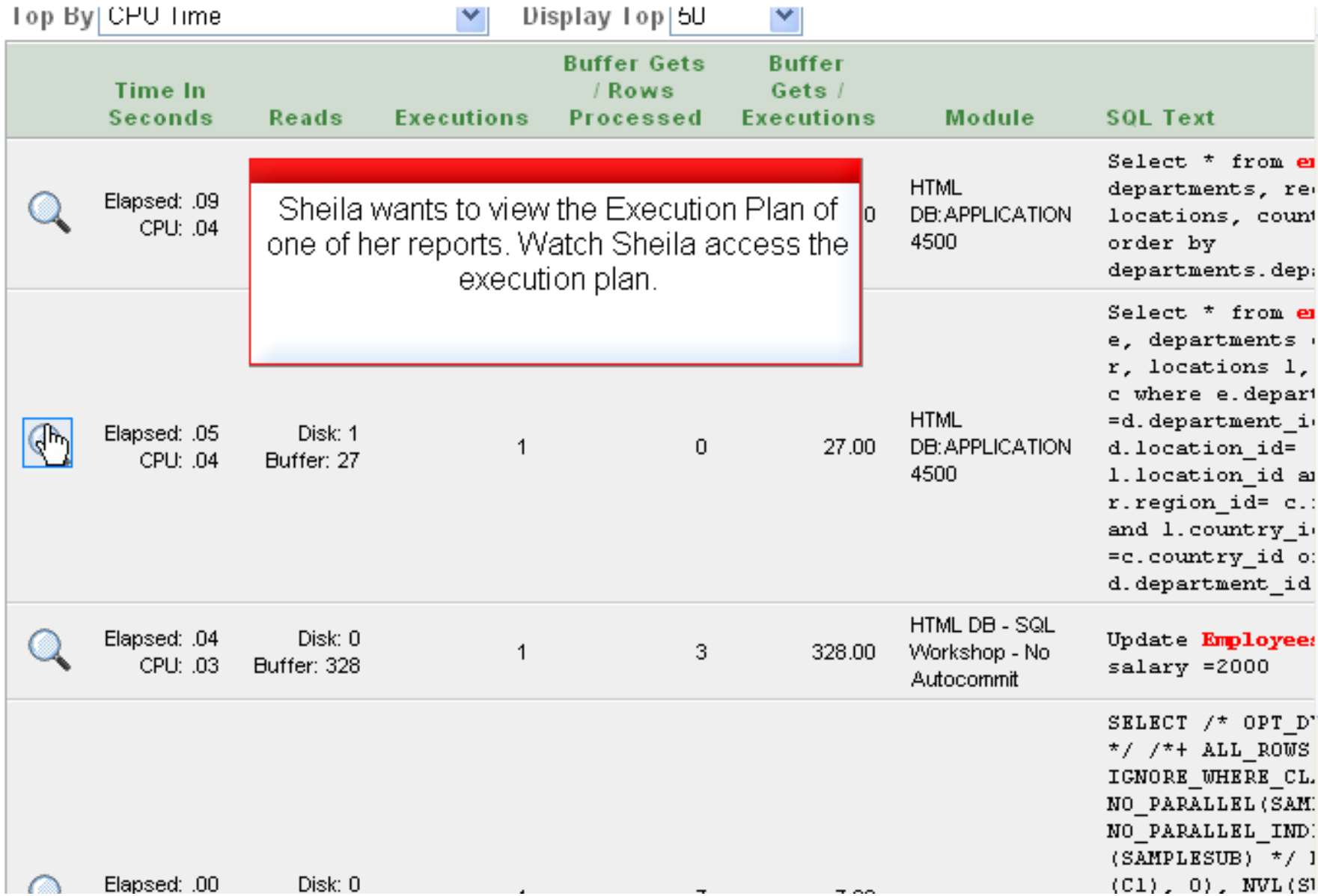


Sheila wants to view the statistics for some of the reports she has run. To do this she goes to Top SQL page. Watch Sheila as she views the statistics


ORACLE Database Express Edition
Home
Logout
Help
User: SHEILA
ome > Administration > Database Monitor > Top SQL
SQL Text
Minimum Executions
Module
Top By
CPU Time
Sheila wants to search for the SQL statements that she executed on employees table. Type employees in the SQL Text link
Time In Seconds
Buffer Gets / Executions
Module
Elapsed: 196.21
CPU: 196.20
Buffer: 27
2,984
13,669,968.00
-
Elapsed: 119.88
CPU: 108.30
Disk: 6,106
Buffer: 644,350
565
1,147
1,140.44
? @emperor.us.oracle.com (TNS V1-V3)
Elapsed: 39.78
CPU: 34.40
Disk: 186
Buffer: 568,646
2,252
253
252.51
HTML DB:APPLICATION 4000
Elapsed: 39.29
CPU: 33.26
Disk: 3
Buffer: 422,782
2,237
189
189.00
HTML DB:APPLICATION 4000
Elapsed: 17.14
CPU: 15.98
Disk: 18
Buffer: 99,638
2,237
45
44.54
HTML DB:APPLICATION 4000
Elapsed: 16.52
CPU: 15.39
Disk: 2
Buffer: 272,736
417
656
654.04
HTML DB:APPLICATION 4500


Home
Logout
Help
Go
Click the Go button
ffer
ts /
utions
Module
SQL Text
,968.00
-
select o.object_name "Data_Dictionary_View_Name", c.comments "Comments
sys.all_objects o, sys.all_tab_comments c where o.owner = c.owner (+)
= c.table_name (+) and o.object_type = 'VIEW' and o.owner = 'SYS' and
,140.44
?
@emperor.us.oracle.com
(TNS V1-V3)
declare rc__ number; begin owa.init_cgi_env(:n__, :nm__, :v__); htp.HT
null; null; null; null; f(p=>:p); if (wpg_docload.is_file_download) th
wpg_docload.get_download_file(:doc_info); null; null; null; commit; el
null; null; null; commit; owa.get_page(:data__, :ndata__); end if; :rc
252.51
HTML DB:APPLICATION
4000
begin wwv_flow_region_layout.show_on_load (p_page => :fb_flow_page_id
p_flow=> :fb_flow_id, p_session=>:flow_session, p_button_class=>'buttc
189.00
HTML DB:APPLICATION
4000
begin wwv_flow_region_layout.show_shared(p_page => :fb_flow_page_id,
p_flow=> :fb_flow_id, p_session=>:flow_session, p_button_class=>'buttc
44.54
HTML DB:APPLICATION
4000
begin wwv_flow_region_layout.show_on_submit (p_page => :fb_flow_page_
p_flow=> :fb_flow_id, p_session=>:flow_session, p_button_class=>'buttc
654.04
HTML DB:APPLICATION
4500
begin wwv_flow_xe_config.show_database_info(:APP_USER); end;


ORACLE Database Express Edition
Home
Logout
Help
User: SHEILA
Home > Administration > Database Monitor > Top
The Top SQL page displays all the SQL statements containing "employees"
SQL Text employees
Minimum Executions
Module
Top By CPU Time
Display Top 50
Time In Seconds
Reads
Executions
Buffer Gets / Rows Processed
Buffer Gets / Executions
Module
SQL Text
Elapsed: .09
CPU: .04
Disk: 1
Buffer: 322
2
1
161.00
HTML DB:APPLICATION 4500
Select * from e
departments, re
locations, coun
order by
departments.dep
Elapsed: .05
CPU: .04
Disk: 1
Buffer: 27
1
0
27.00
HTML DB:APPLICATION 4500
Select * from e
e, departments
r, locations l,
c where e.depar
=d.department_i
d.location_id=
l.location_id a
r.region_id= c.
and l.country_i
=c.country_id o
d.department_id


Top By CPU Time
Display Top 50
Time In Seconds
Reads
Executions
Buffer Gets / Rows Processed
Buffer Gets / Executions
Module
SQL Text
Sheila wants to view the Execution Plan of one of her reports. Watch Sheila access the execution plan.
Elapsed: .09
CPU: .04
HTML DB:APPLICATION 4500
Select * from e
departments, re
locations, coun
order by
departments.dep
Elapsed: .05
CPU: .04
Disk: 1
Buffer: 27
1
0
27.00
HTML DB:APPLICATION 4500
Select * from e
e, departments
r, locations l,
c where e.depar
=d.department_i
d.location_id=
l.location_id a
r.region_id= c.
and l.country_i
=c.country_id o
d.department_id
Elapsed: .04
CPU: .03
Disk: 0
Buffer: 328
1
3
328.00
HTML DB - SQL Workshop - No Autocommit
Update Employee
salary =2000
Elapsed: .00
Disk: 0
SELECT /* OPT_D
/ /+ ALL_ROWS
IGNORE_WHERE_CL
NO_PARALLEL(SAM
NO_PARALLEL_IND
(SAMPLESUB) */
(C1), 0), NVL(S

Query Plan

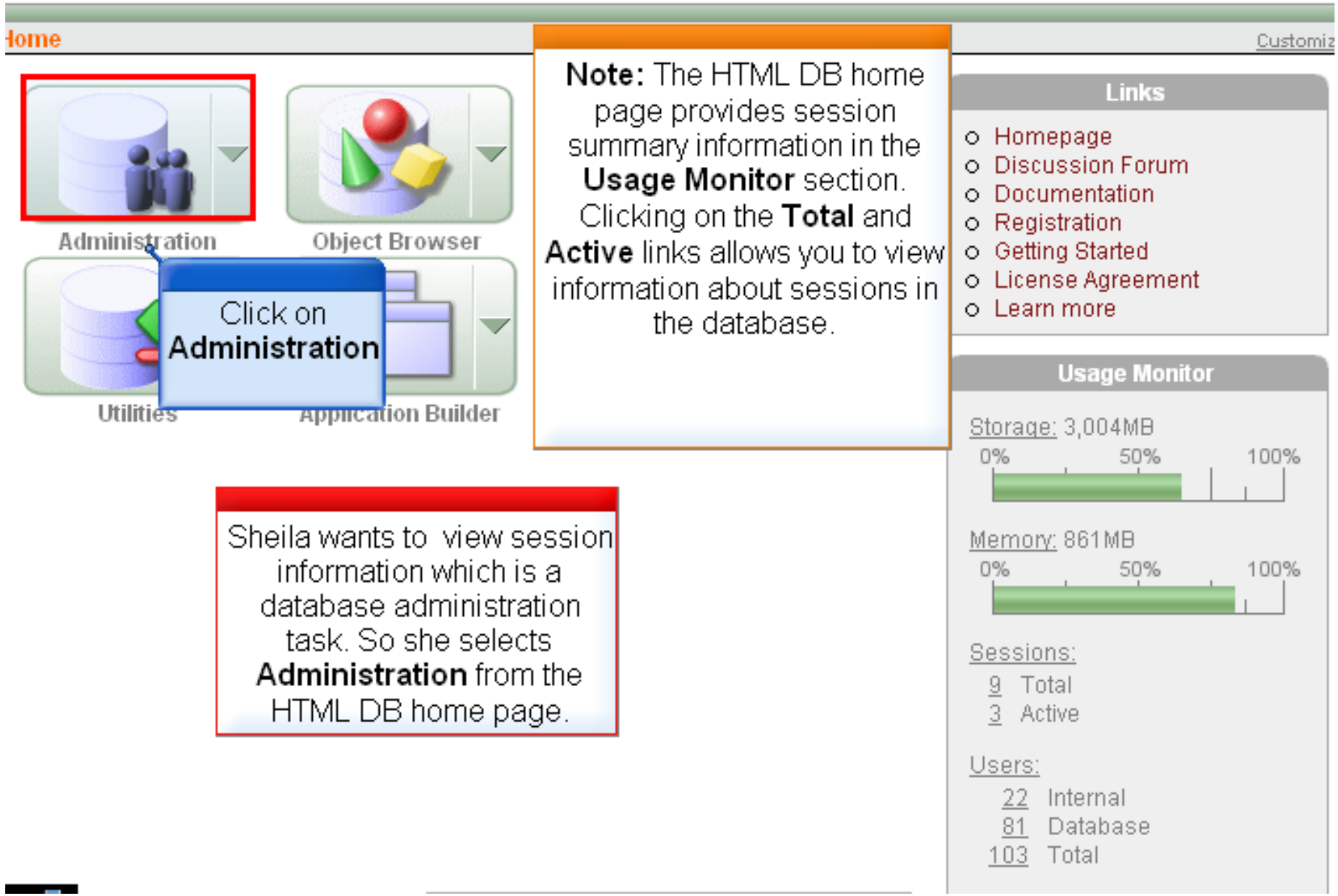
Operation	Options	Object	Rows	Cost	Time	Bytes	Filter Predi
SELECT STATEMENT				14			
SORT	ORDER BY		105	14	1	17,325	
HASH JOIN			105	13	1	17,325	
HASH JOIN			27	9	1	2,619	
NESTED LO			27	6	1	2,241	
MERGE JOIN			27	6	1	1,863	
TABLE ACCESS	BY INDEX ROWID	DEPARTMENTS	27	2	1	540	
INDEX	FULL SCAN	DEPT_LOCATION_IX	27	1	1		
SORT	JOIN		23	4	1	1,127	"D"."LO = "L"."LO
TABLE ACCESS	FULL	LOCATIONS	23	3	1	1,127	
INDEX	UNIQUE SCAN	COUNTRY_C_ID_PK	1	0		14	
TABLE ACCESS	FULL	REGIONS	4	3	1	56	
TABLE ACCESS	FULL	EMPLOYEES	106	3	1	7,208	

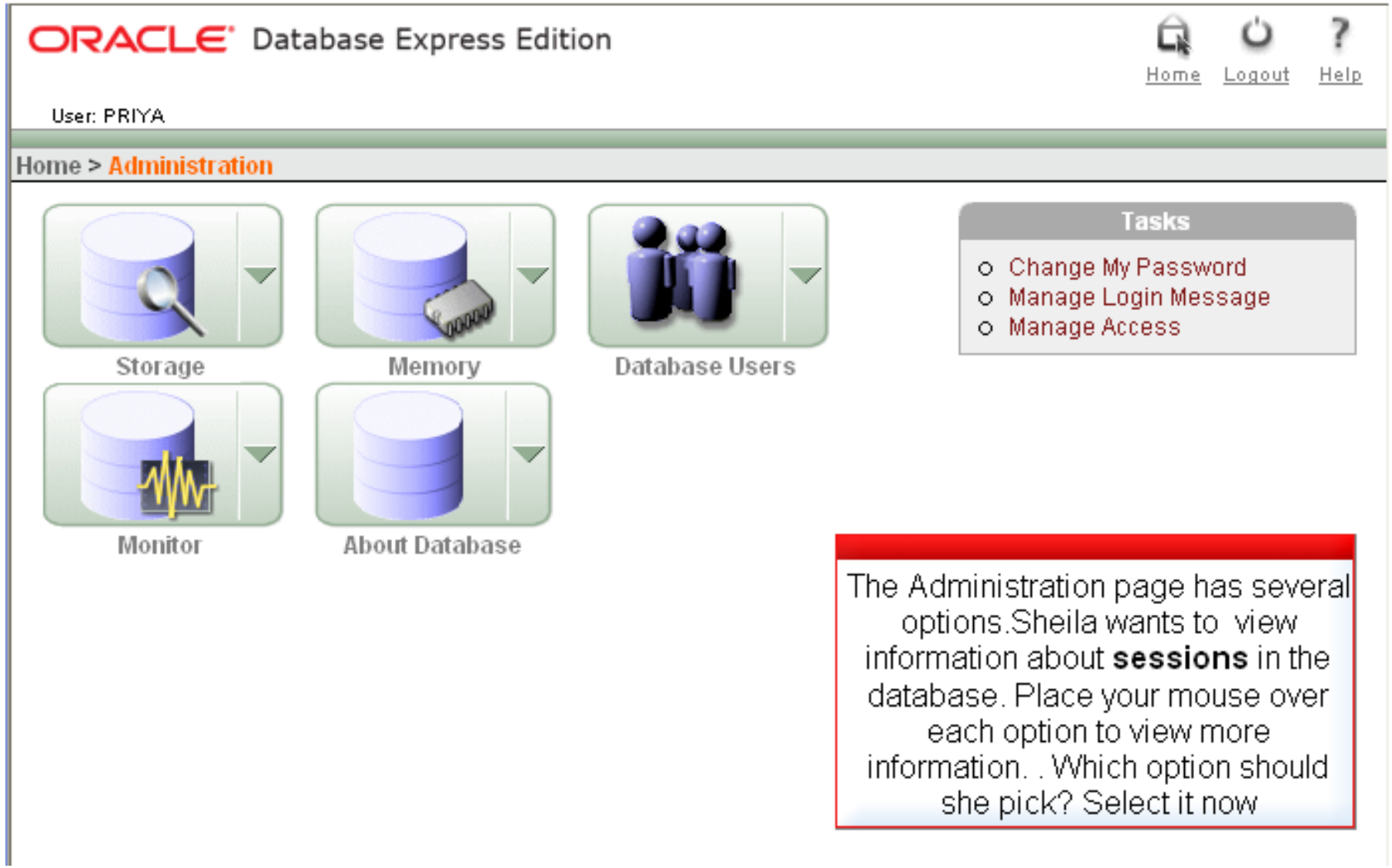
* Unindexed columns are shown in red

Sheila can similarly view the execution plans of all her SQL statements

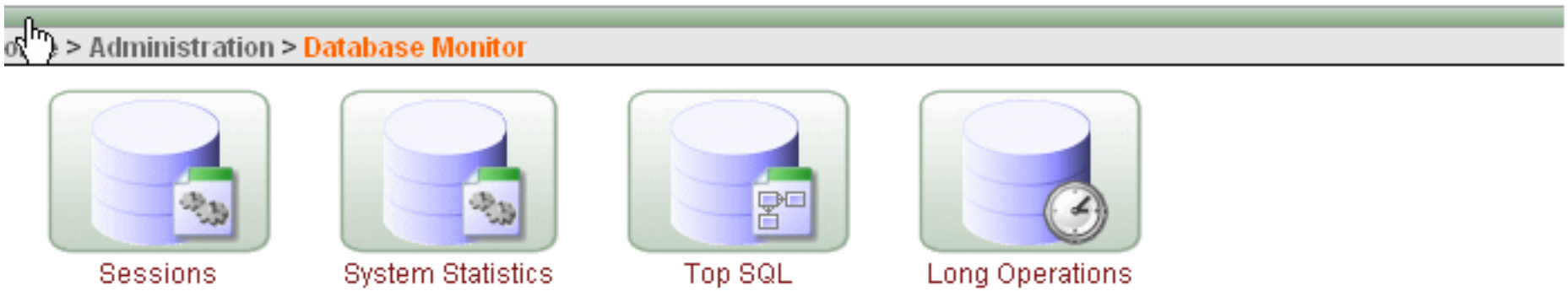
Monitoring Sessions

- Sheila is unable to make changes to the data in the EMPLOYEES table because of a lock placed by another session. She waits a reasonable amount of time for the lock to be released. However, when the data continues to be locked, she decides to terminate the blocking session so that she can proceed.

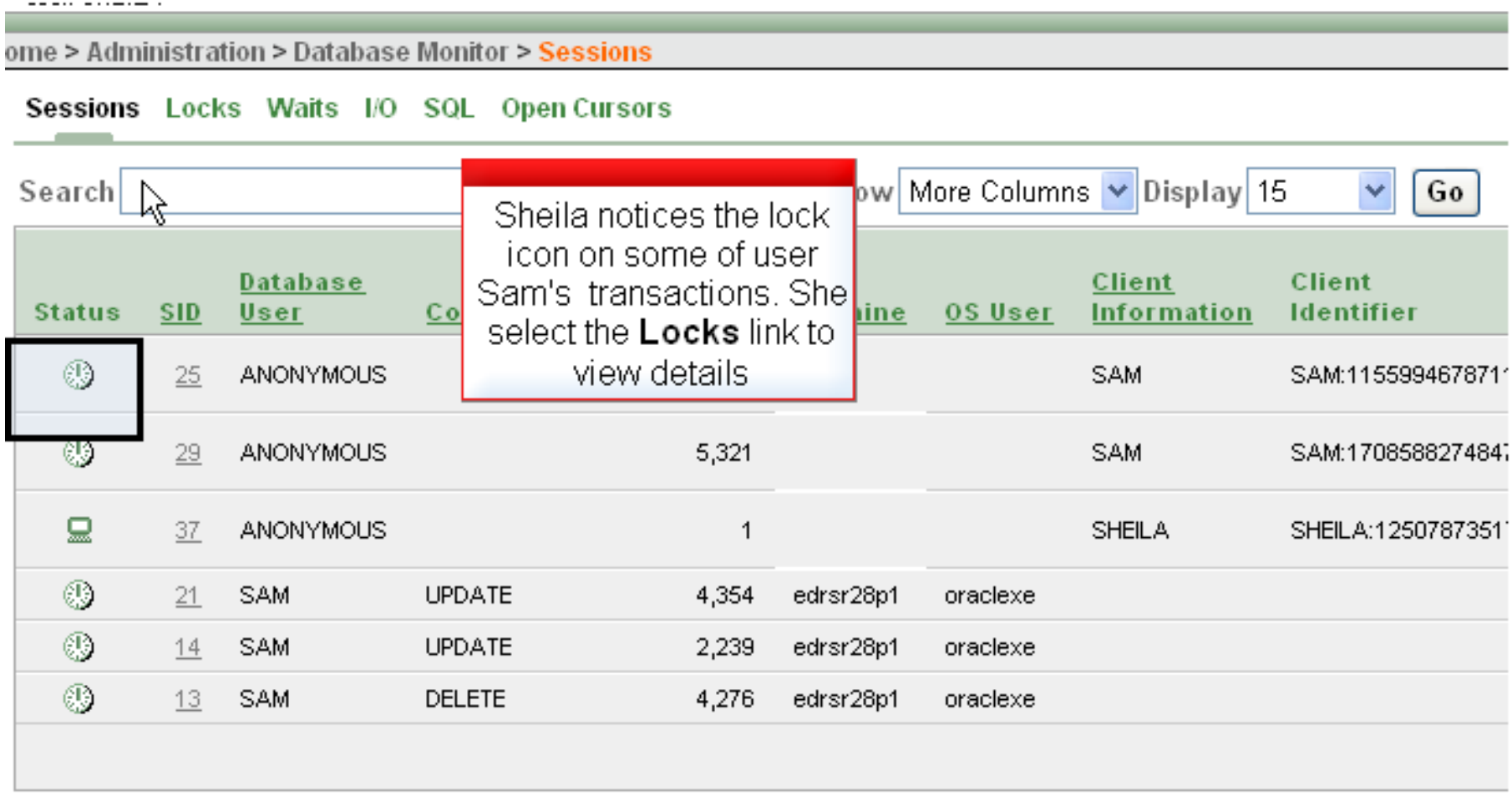

Home
Customiz
Administration
Object Browser
Utilities
Application Builder
Click on Administration
Note: The HTML DB home page provides session summary information in the Usage Monitor section. Clicking on the Total and Active links allows you to view information about sessions in the database.
Sheila wants to view session information which is a database administration task. So she selects Administration from the HTML DB home page.
Links
Homepage
Discussion Forum
Documentation
Registration
Getting Started
License Agreement
Learn more
Usage Monitor
Storage: 3,004MB
0% 50% 100%
Memory: 861MB
0% 50% 100%
Sessions:
9 Total
3 Active
Users:
22 Internal
81 Database
103 Total


ORACLE Database Express Edition
Home
Logout
Help
User: PRIYA
Home > Administration
Storage
Memory
Database Users
Monitor
About Database
Tasks
Change My Password
Manage Login Message
Manage Access
The Administration page has several options.Sheila wants to view information about sessions in the database. Place your mouse over each option to view more information. . Which option should she pick? Select it now

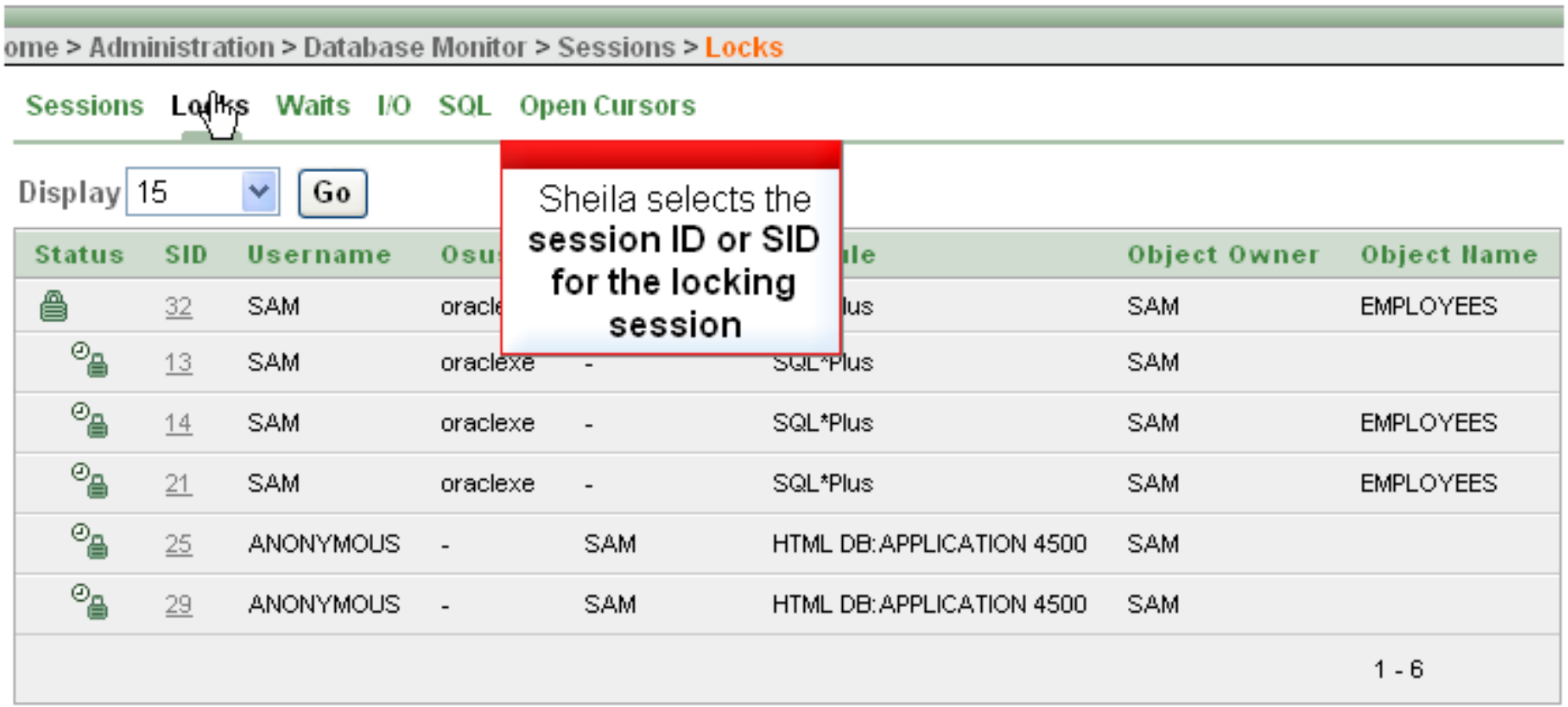
=Monitor



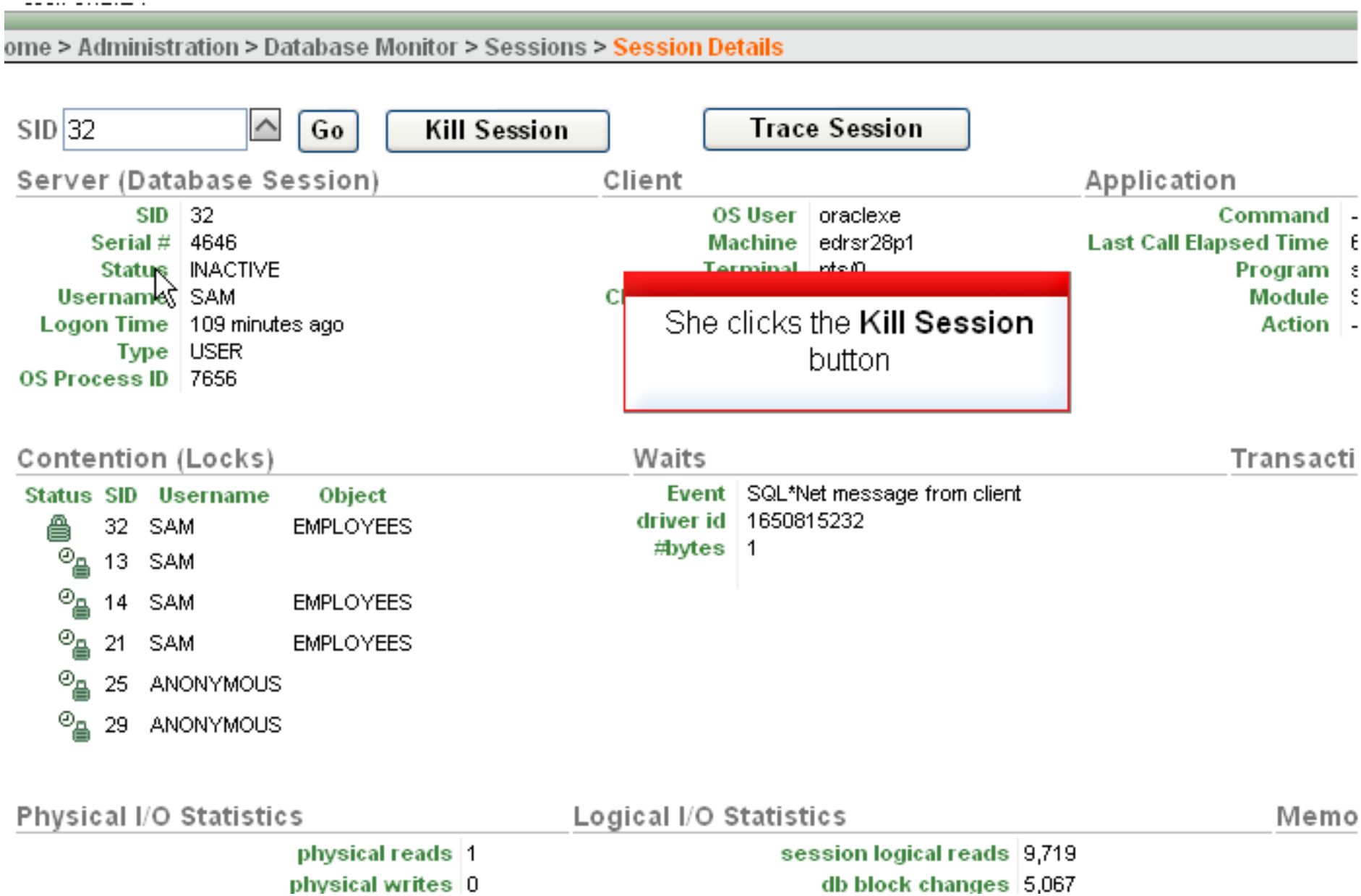
Sheila has noticed that her update on employees table is pending. This because of an uncommitted transaction that has placed a lock on the data. Sheila wants to view the session information to see who has a lock and terminate that session. Watch Sheila access the session information

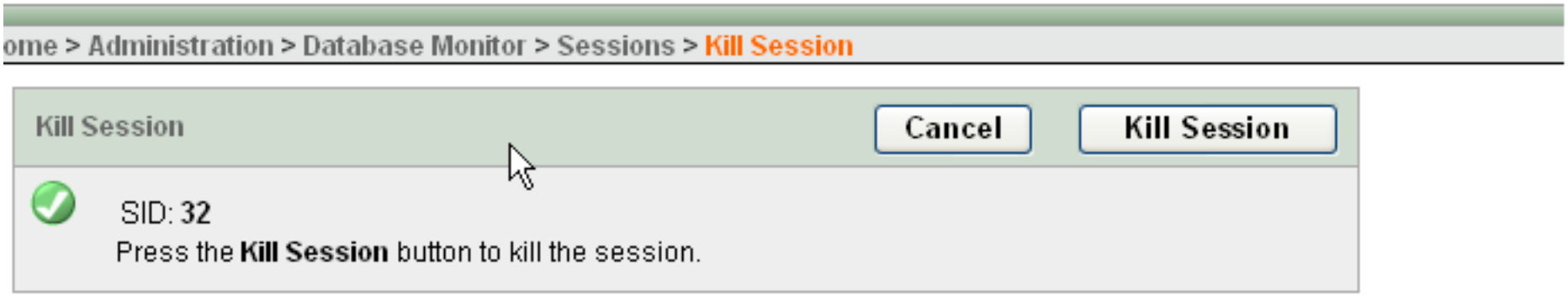


- Current Session
- Idle Session
- Active Session



- Current Session
- Idle Session
- Blocking Session
- Blocked Session
- Active Session
- Long Transaction


ome > Administration > Database Monitor > Sessions > Session Details
SID 32
Go
Kill Session
Trace Session
Server (Database Session)
SID 32
Serial # 4646
Status INACTIVE
Username SAM
Logon Time 109 minutes ago
Type USER
OS Process ID 7656
Client
OS User oraclexe
Machine edrsr28p1
Application
Command -
Last Call Elapsed Time
Program
Module
Action -
She clicks the Kill Session button
Contention (Locks)
Status SID Username Object
32 SAM EMPLOYEES
13 SAM
14 SAM EMPLOYEES
21 SAM EMPLOYEES
25 ANONYMOUS
29 ANONYMOUS
Waits
Event SQL*Net message from client
driver id 1650815232
#bytes 1
Transacti
Physical I/O Statistics
physical reads 1
physical writes 0
Logical I/O Statistics
session logical reads 9,719
db block changes 5,067
Memo



At the confirmation page, Sheila clicks the **Kill Session** button again

ORA-00031: session marked for kill

Sheila receives confirmation that the session will be killed. This will release all the locks on the data.

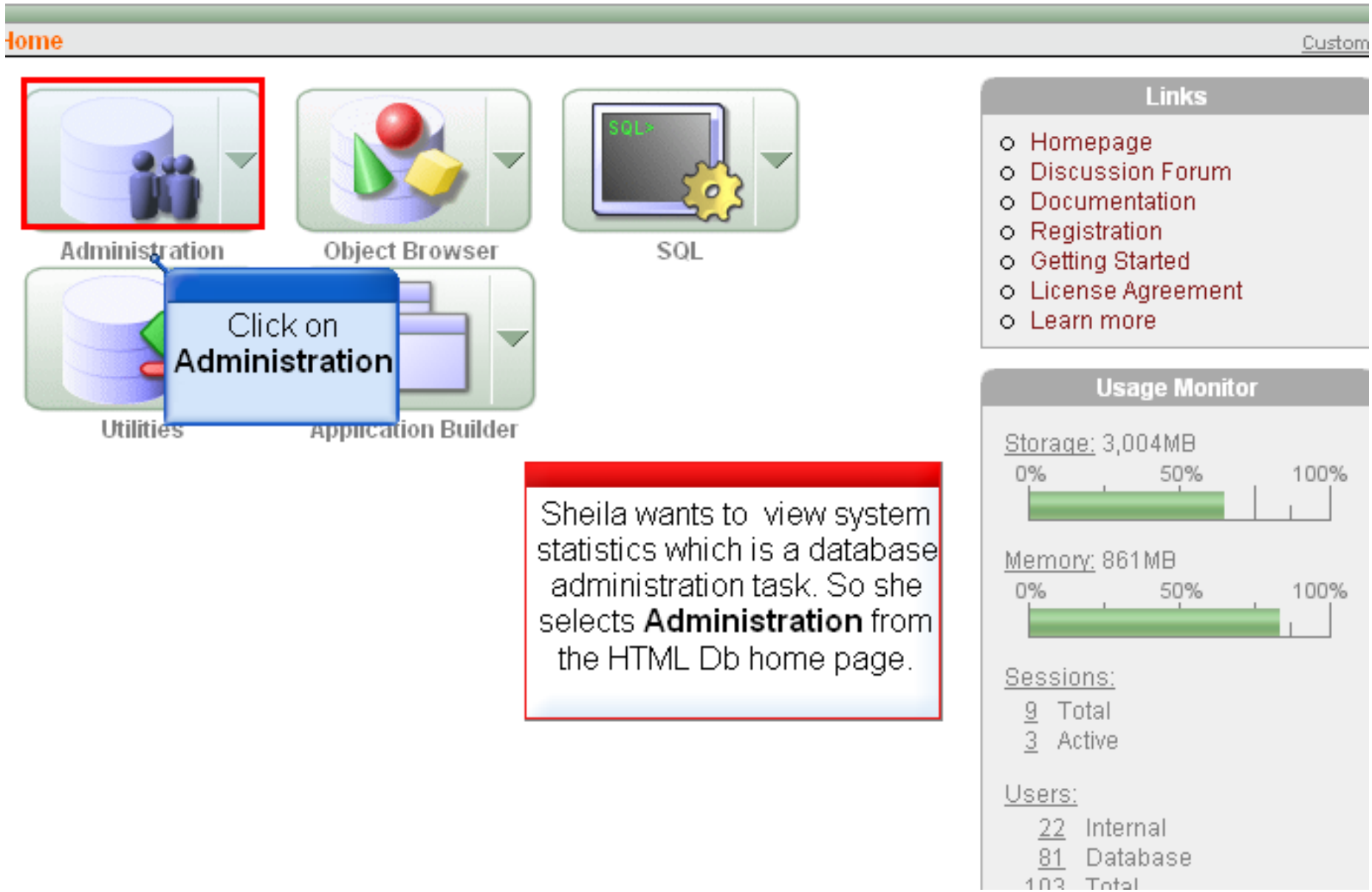
Note: Killing a session will cause an uncommitted transaction in that session to rollback.

Return to application.

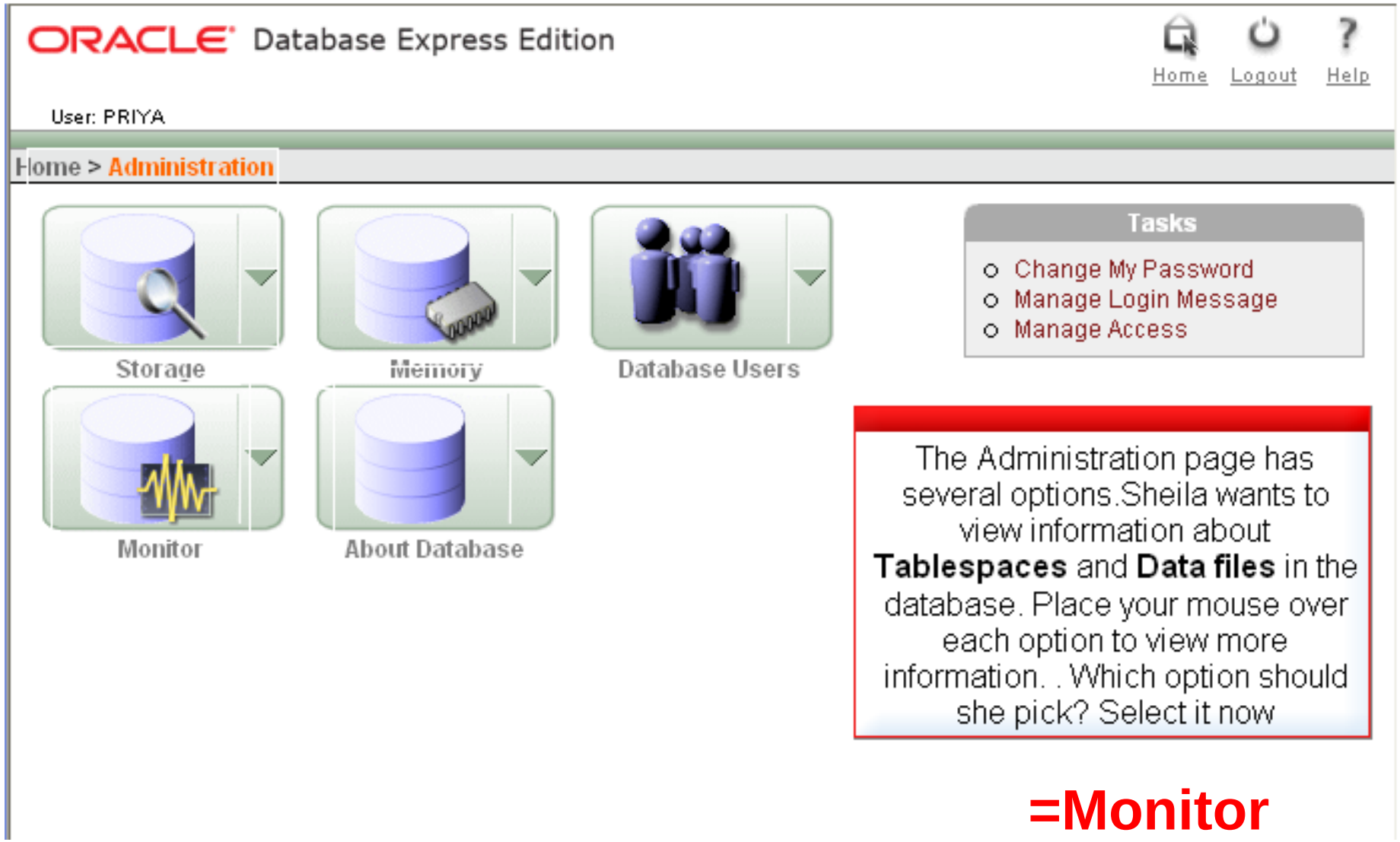
Viewing System Statistics

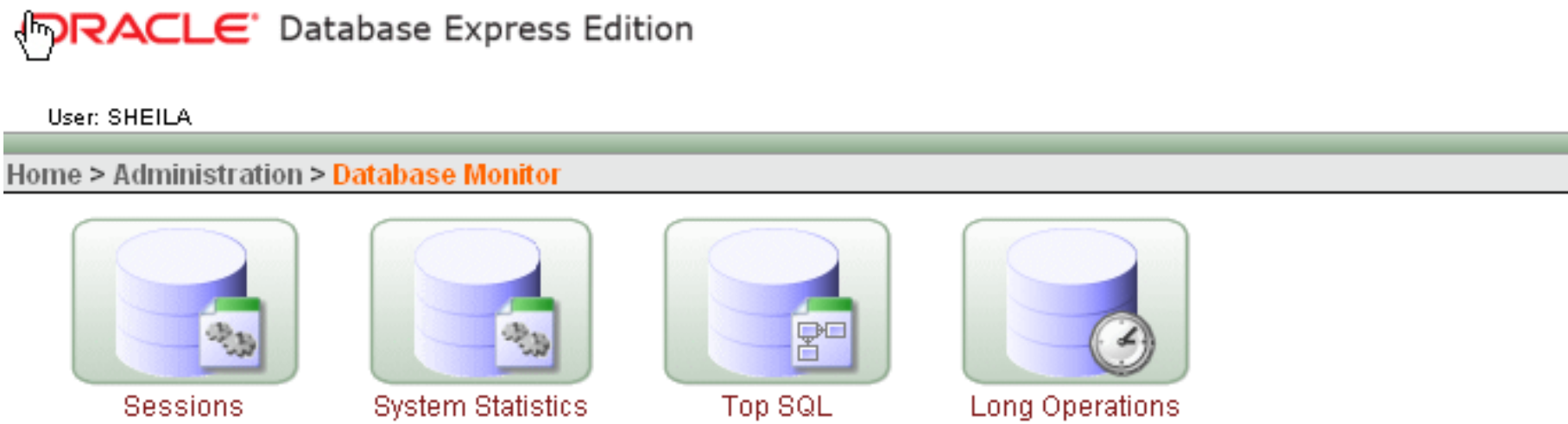
- System statistics describe the system's hardware characteristics (such as I/O and CPU performance and utilization) to the query optimizer. When choosing an execution plan, the optimizer estimates the I/O and CPU resources required for each query. System statistics enable the query optimizer to more accurately estimate I/O and CPU costs, enabling the query optimizer to choose a better execution plan.

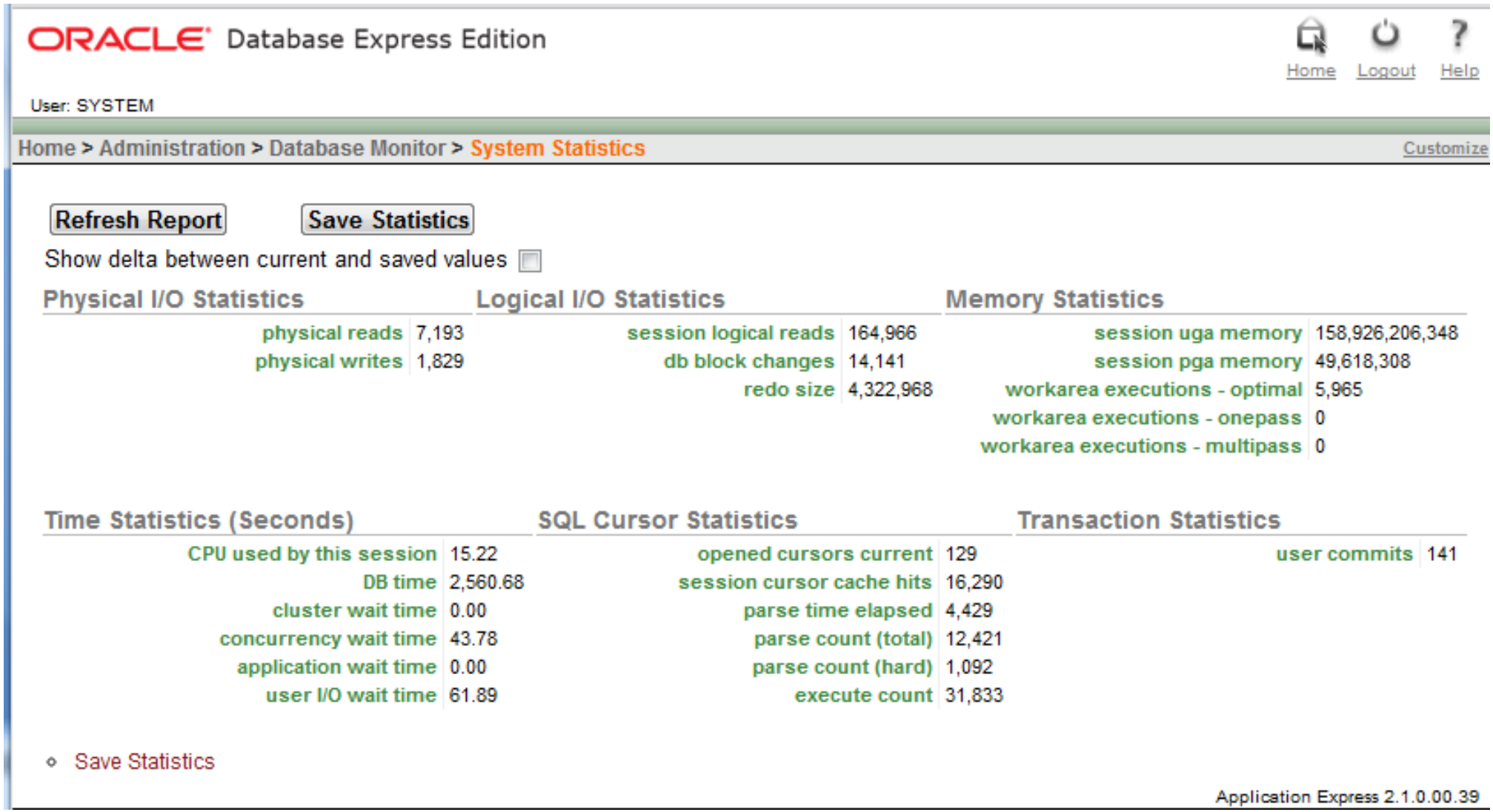
- Sheila wants to periodically save the system statistics for analysis.When she does this, she deletes older statistics and saves the current statistics.



Sheila wants to view system statistics which is a database administration task. So she selects **Administration** from the HTML Db home page.


ORACLE Database Express Edition
Home
Logout
Help
User: PRIYA
Home > Administration
Storage
Memory
Database Users
Monitor
About Database
Tasks
Change My Password
Manage Login Message
Manage Access
The Administration page has several options.Sheila wants to view information about **Tablespaces** and **Data files** in the database. Place your mouse over each option to view more information. . Which option should she pick? Select it now
=Monitor


ORACLE Database Express Edition
User: SHEILA
Home > Administration > Database Monitor
Sessions
System Statistics
Top SQL
Long Operations
Sheila wants to view the Resource usage such as CPU, Memory and I/O. Watch Sheila access the System Statistics


ORACLE Database Express Edition
Home
Logout
Help
User: SYSTEM
Home > Administration > Database Monitor > System Statistics
Customize
Refresh Report
Save Statistics
Show delta between current and saved values
Physical I/O Statistics
physical reads 7,193
physical writes 1,829
Logical I/O Statistics
session logical reads 164,966
db block changes 14,141
redo size 4,322,968
Memory Statistics
session uga memory 158,926,206,348
session pga memory 49,618,308
workarea executions - optimal 5,965
workarea executions - onepass 0
workarea executions - multipass 0
Time Statistics (Seconds)
CPU used by this session 15.22
DB time 2,560.68
cluster wait time 0.00
concurrency wait time 43.78
application wait time 0.00
user I/O wait time 61.89
SQL Cursor Statistics
opened cursors current 129
session cursor cache hits 16,290
parse time elapsed 4,429
parse count (total) 12,421
parse count (hard) 1,092
execute count 31,833
Transaction Statistics
user commits 141
Save Statistics
Application Express 2.1.0.00.39

The End