

# TEMĂ

## **Algoritm de Sortare – BUBBLE SORT vs Order By.**

Sortăm angajații din tabelul employees, după id-ul lor crescător.

### **Rezolvare:**

DECLARE

TYPE tab\_ind IS TABLE OF employees%rowtype INDEX BY PLS\_INTEGER;

t tab\_ind;

ok BOOLEAN;

aux INTEGER;

BEGIN

-- atribuire valori

SELECT \* BULK COLLECT INTO t

FROM employees

WHERE ROWNUM <= 10;

--parcure

LOOP

ok := false; -- False

FOR I IN 2 .. t.LAST LOOP

IF t(i-1).employee\_id > t(i).employee\_id THEN

-- facem swap

aux := t(i).employee\_id;

t(i).employee\_id := t(i-1).employee\_id;

t(i-1).employee\_id := aux;

ok := true;

END IF;

```

END LOOP;

EXIT WHEN NOT ok; -- daca am parcurs sortat si nu am facut nicio interschimbare (swap)

-- inseamna ca tabloul nostru este sortat

END LOOP;

FOR i in t.FIRST .. t.LAST LOOP

    DBMS_OUTPUT.PUT_LINE(t(i).employee_id);

END LOOP;

END;

select * from table(dbms_xplan.display_cursor(sql_id=>'7pyh801vghaks', format=>'ALLSTATS LAST')); --
cost bubble sort

select employee_id from employees where rownum <=10 order by employee_id asc;

select * from table(dbms_xplan.display_cursor(sql_id=>'bjbu842r6yuhr', format=>'ALLSTATS LAST')); --
cost order by

```

### **Print-Screen:**

`select * from employees where rownum <=10;`

	EMPLOYEE_ID	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER	HIRE_DATE	JOB_ID	SALARY	COMMISSION_PCT	MANAGER_ID	DEPARTMENT_ID
1	198	Donald	OConnell	DOCONNEL	650.507.9833	21-JUN-99	SH CLERK	2600	(null)	124	50
2	199	Douglas	Grant	DGRANT	650.507.9844	13-JAN-00	SH CLERK	2600	(null)	124	50
3	200	Jennifer	Whalen	JWHALEN	515.123.4444	17-SEP-87	AD ASST	4400	(null)	101	10
4	201	Michael	Hartstein	MHARTSTE	515.123.5555	17-FEB-96	MK MAN	13000	(null)	100	20
5	202	Pat	Fay	PFAY	603.123.6666	17-AUG-97	MK REP	6000	(null)	201	20
6	203	Susan	Mavris	SMAVRIS	515.123.7777	07-JUN-94	HR REP	6500	(null)	101	40
7	204	Hermann	Baer	HBAER	515.123.8888	07-JUN-94	PR REP	10000	(null)	101	70
8	205	Shelley	Higgins	SHIGGINS	515.123.8080	07-JUN-94	AC MGR	12000	(null)	101	110
9	206	William	Gietz	WGIETZ	515.123.8181	07-JUN-94	AC ACCOUNT	8300	(null)	205	110
10	100	Steven	King	SKING	515.123.4567	17-JUN-87	AD PRES	24000	(null)	(null)	90

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```

FROM employees
WHERE ROWNUM <= 10;
--parcurgere
LOOP
    ok := false; -- False
    FOR I IN 2 .. t.LAST LOOP
        IF t(i-1).employee_id > t(i).employee_id THEN
            -- facem swap
            aux := t(i).employee_id;
            t(i).employee_id := t(i-1).employee_id;
            t(i-1).employee_id := aux;
            ok := true;
        END IF;
    END LOOP;
    EXIT WHEN NOT ok; -- daca am parcurs sortat si nu am facut nicio interschimbare (swap)
    -- inseamna ca tabloul nostru este sortat
END LOOP;
FOR i in t.FIRST .. t.LAST LOOP
    DBMS_OUTPUT.PUT_LINE(t(i).employee_id);
END LOOP;
END;

select * from table(dbms_xplan.display_cursor(sql_id=>'7pyh801vghaks', format=>'ALLSTATS LAST')); -- cost bubble sort

select employee_id from employees where rownum <=10 order by employee_id asc;

```

DBMS Output

lab x

100

198

199

200

201

202

203

204

205

206

Autotrace x Explain Plan x Query Result x Script Output x

Task completed in 0.046 seconds

PL/SQL procedure successfully completed.

Click on an identifier with the Control key down to perform "Go to Declaration"

Line 30 Column 5 Insert Modified Windows G

```
select * from table(dbms_xplan.display_cursor(sql_id=>'7pyh801vghaks', format=>'ALLSTATS LAST')); -- cost bubble sort
```

```
select employee_id from employees where rownum <=10 order by employee_id asc;
```

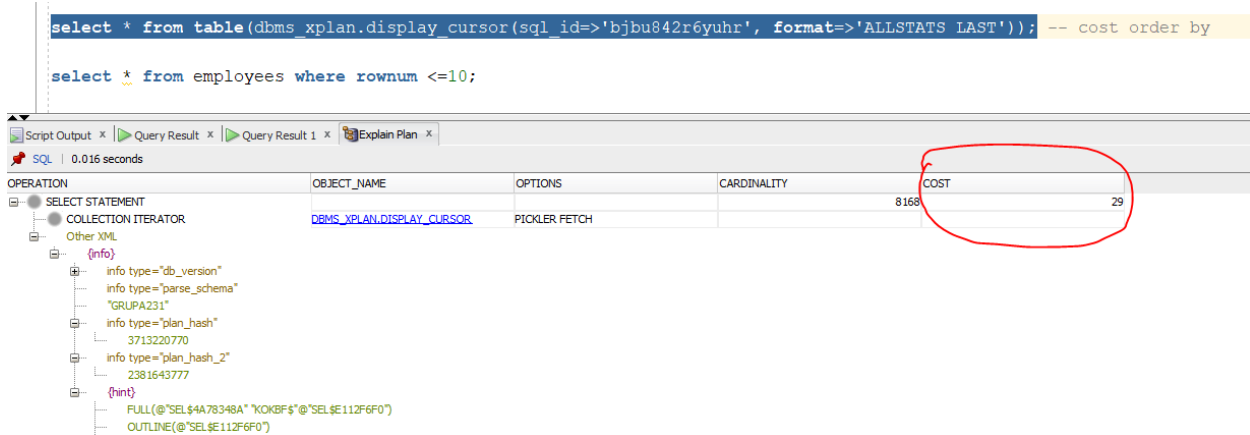
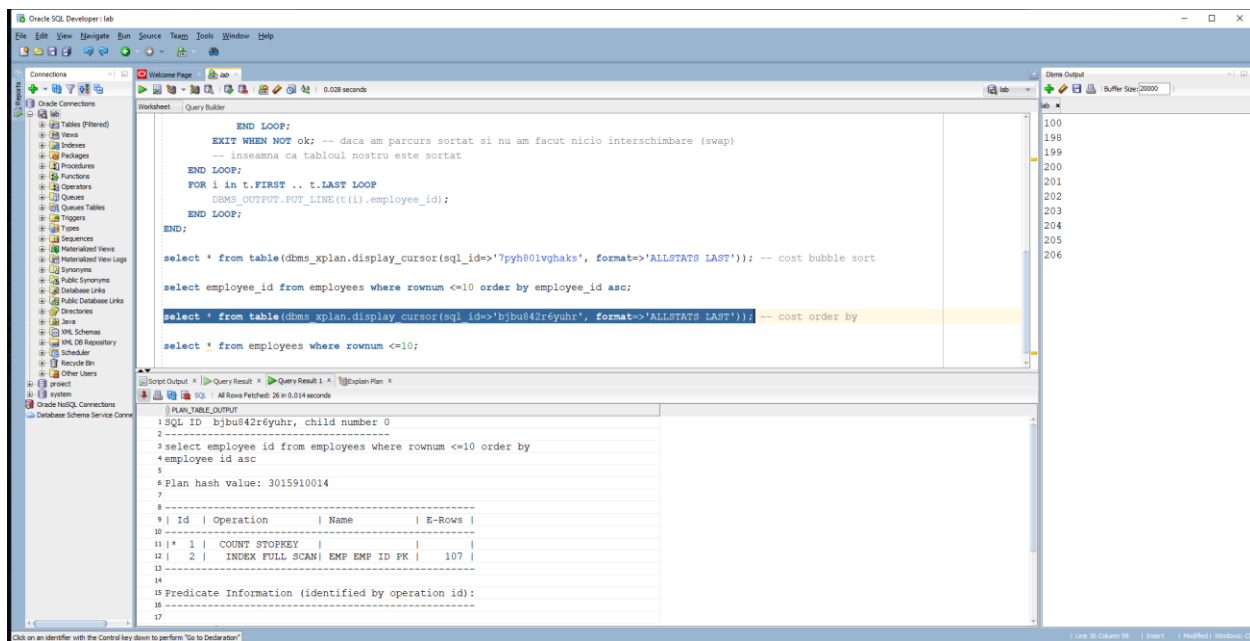
```
select * from table(dbms_xplan.display_cursor(sql_id=>'bjbu842r6yuhr', format=>'ALLSTATS LAST')); -- cost order by
```

```
select * from employees where rownum <=10;
```

Script Output x Explain Plan x Autotrace x Query Result x

SQL All Rows Fetched: 10 in 0.005 seconds

	EMPLOYEE_ID
1	100
2	101
3	102
4	103
5	104
6	105
7	106
8	107
9	108
10	109



BubbleSort (COST 2) este mai rapid decat ORDER BY (COST 29).

### Comparatie 3.13 3.14 3.16.

Exemplul 3.14 este cel optim deoarece conform documentatiei ORACLE, instructiunea CASE (se bazeaza pe un SWITCH din alte limbaje). In acest exemplu instructiunea case este folosita doar pentru a afisa un mesaj pe ecran, nu pentru a executa comenzi.

Instructiunea CASE, IF THEN ELSE (Exemplul 3.16) este mai ineficienta decat SWITCH (Exemplul 3.14).

Diferenta dintre cele doua nu este suficient de vizibila pentru oricine (expresia se termina doar cu END, iar instructiunea cu END CASE). O deosebire fiind faptul ca expresia CASE returneaza o valoare, iar instructiunea CASE executa comenzi.

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Grupa 231

Temă SGBD #5