***Oefening 1:***

**CREATE OR REPLACE PROCEDURE** *toon\_laatste\_emp*

**IS**

v\_emp\_id EMPLOYEES.EMPLOYEE\_ID%**TYPE**;

v\_naam EMPLOYEES.LAST\_NAME%**TYPE**;

v\_hire\_date EMPLOYEES.HIRE\_DATE%**TYPE**;

**BEGIN**

**SELECT** EMPLOYEE\_ID, LAST\_NAME, HIRE\_DATE

**INTO** v\_emp\_id, v\_naam, v\_hire\_date

**FROM** EMPLOYEES

**WHERE** HIRE\_DATE = (**SELECT** *MAX*(HIRE\_DATE)

**FROM** EMPLOYEES);

DBMS\_OUTPUT.PUT\_LINE('De laatst aangeworven medewerker is ' || v\_emp\_id || ' ' || v\_naam || ' en werd aangeworven op ' || v\_hire\_date);

**END**;

(Kan voor fouten zorgen als meerdere employees op het laatste moment tegelijk zijn aangenomen, select returnt dan 2 rijen en is dus ongeldig, zou opgelost kunnen worden met een cursorloop)

***Oefening 2:***

**CREATE OR REPLACE PROCEDURE** *grootste\_dept* **IS** v\_max\_employees **NUMBER DEFAULT** 0;  
 v\_max\_dept EMPLOYEES.DEPARTMENT\_ID%**TYPE**;  
 v\_dept\_meeste\_emp EMPLOYEES.DEPARTMENT\_ID%**TYPE**;  
 v\_emp\_lastname EMPLOYEES.LAST\_NAME%**TYPE**;  
 v\_emp\_firstname EMPLOYEES.FIRST\_NAME%**TYPE**;  
 v\_teller\_emp **NUMBER DEFAULT** 0;  
 v\_teller\_dep **NUMBER DEFAULT** 0;  
 v\_aantal\_emp **NUMBER DEFAULT** 0;  
 v\_dept\_name DEPARTMENTS.DEPARTMENT\_NAME%**TYPE**;  
 v\_salary **NUMBER DEFAULT** 0;  
 v\_max\_salary **NUMBER DEFAULT** 0;  
 v\_emp\_nummer **NUMBER DEFAULT** 0;  
 v\_max\_emp **NUMBER DEFAULT** 0;  
 **BEGIN  
 SELECT** *MAX*(DEPARTMENT\_ID)  
 **INTO** v\_max\_dept  
 **FROM** EMPLOYEES;  
  
 **LOOP  
 SELECT** *COUNT*(EMPLOYEE\_ID)  
 **INTO** v\_aantal\_emp  
 **FROM** EMPLOYEES  
 **WHERE** DEPARTMENT\_ID = v\_teller\_dep;  
  
 **IF** v\_aantal\_emp >= v\_max\_employees  
 **THEN** v\_max\_employees := v\_aantal\_emp;  
 v\_dept\_meeste\_emp := v\_teller\_dep;  
 **END IF**;  
  
 v\_teller\_dep := v\_teller\_dep + 1;  
 **EXIT WHEN** v\_teller\_dep = v\_max\_dept;  
 **END LOOP**;  
  
 **SELECT** *MAX*(EMPLOYEE\_ID)  
 **INTO** v\_aantal\_emp  
 **FROM** EMPLOYEES  
 **WHERE** DEPARTMENT\_ID = v\_dept\_meeste\_emp;  
  
 **SELECT** *MIN*(EMPLOYEE\_ID)  
 **INTO** v\_emp\_nummer  
 **FROM** EMPLOYEES  
 **WHERE** DEPARTMENT\_ID = v\_dept\_meeste\_emp;  
  
 **LOOP  
 SELECT** SALARY, LAST\_NAME, FIRST\_NAME  
 **INTO** v\_salary, v\_emp\_lastname, v\_emp\_firstname  
 **FROM** EMPLOYEES  
 **WHERE** EMPLOYEE\_ID = v\_emp\_nummer;  
  
 **IF** v\_salary > v\_max\_salary  
 **THEN** v\_max\_salary := v\_salary;  
 v\_max\_emp :=v\_dept\_name;  
 **END IF**;  
  
 **EXIT WHEN** v\_emp\_nummer = v\_aantal\_emp;  
  
 **SELECT** *MIN*(EMPLOYEE\_ID)  
 **INTO** v\_emp\_nummer  
 **FROM** EMPLOYEES  
 **WHERE** EMPLOYEE\_ID > v\_emp\_nummer **AND** DEPARTMENT\_ID = v\_dept\_meeste\_emp;  
 **END LOOP**;  
  
  
 **SELECT** DEPARTMENT\_NAME  
 **INTO** v\_dept\_name  
 **FROM** DEPARTMENTS  
 **WHERE** DEPARTMENT\_ID = v\_dept\_meeste\_emp;  
  
 DBMS\_OUTPUT.PUT\_LINE(v\_emp\_firstname || ' ' || v\_emp\_lastname || ' in departement ' || v\_dept\_name || ' heeft het hoogste salaris, nl. ' || v\_max\_salary);  
 **END**;

***Oefening 3:***

**CREATE OR REPLACE PROCEDURE** *minimumlonen*

(p\_land\_naam COUNTRIES.COUNTRY\_NAME%**TYPE**,

p\_minimumloon EMPLOYEES.SALARY%**TYPE**)

**IS**

**BEGIN**

**UPDATE** EMPLOYEES

**SET** SALARY = p\_minimumloon

**WHERE** SALARY < p\_minimumloon **AND** DEPARTMENT\_ID **IN** (**SELECT** DEPARTMENT\_ID

**FROM** DEPARTMENTS

**WHERE** LOCATION\_ID **IN** (**SELECT** LOCATION\_ID

**FROM** LOCATIONS

**WHERE** COUNTRY\_ID = (**SELECT** COUNTRY\_ID

**FROM** COUNTRIES

**WHERE** COUNTRY\_NAME = p\_land\_naam)));

**END**;

***Oefening 4:***

**CREATE OR REPLACE PROCEDURE** *minimumlonen*

(p\_land\_naam COUNTRIES.COUNTRY\_NAME%**TYPE**,

p\_minimumloon EMPLOYEES.SALARY%**TYPE**,

p\_aantal **OUT NUMBER**)

**IS**

**BEGIN**

**UPDATE** EMPLOYEES

**SET** SALARY = p\_minimumloon

**WHERE** SALARY < p\_minimumloon **AND** DEPARTMENT\_ID **IN** (**SELECT** DEPARTMENT\_ID

**FROM** DEPARTMENTS

**WHERE** LOCATION\_ID **IN** (**SELECT** LOCATION\_ID

**FROM** LOCATIONS

**WHERE** COUNTRY\_ID = (**SELECT** COUNTRY\_ID

**FROM** COUNTRIES

**WHERE** COUNTRY\_NAME = p\_land\_naam)));

p\_aantal := **sql**%**ROWCOUNT**;

**END**;

**DECLARE**

v\_aantal **number**;

**BEGIN**

*minimumlonen*('canada', 2000, v\_aantal);

DBMS\_OUTPUT.PUT\_LINE(v\_aantal);

**END**;

**VARIABLE** b\_v\_aantal\_rows **NUMBER**;

**EXEC** minimumlonen('canada', 2000, :b\_v\_aantal\_rows);

***Oefening 5:***

**CREATE OR REPLACE PROCEDURE** *asterisk\_sal*

(p\_employee\_id **IN** EMPLOYEES.EMPLOYEE\_ID%**TYPE**)

**AS**

v\_salary EMPLOYEES.SALARY%**TYPE**;

v\_asterisks **VARCHAR2**(50);

**BEGIN**

**SELECT** SALARY

**INTO** v\_salary

**FROM** EMPLOYEES

**WHERE** EMPLOYEE\_ID = p\_employee\_id;

**FOR** i\_teller **IN** 1..*TRUNC*(v\_salary / 1000)

**LOOP**

v\_asterisks := v\_asterisks || '\*';

**END LOOP**;

DBMS\_OUTPUT.PUT\_LINE(v\_asterisks);

**END**;

***Oefening 6:***

**CREATE OR REPLACE PROCEDURE** *asterisk\_sal*

(p\_employee\_id **IN** EMPLOYEES.EMPLOYEE\_ID%**TYPE**

,p\_asterisks **OUT VARCHAR2**)

**AS**

v\_salary EMPLOYEES.SALARY%**TYPE**;

v\_asterisks **VARCHAR2**(50);

**BEGIN**

**SELECT** SALARY

**INTO** v\_salary

**FROM** EMPLOYEES

**WHERE** EMPLOYEE\_ID = p\_employee\_id;

**FOR** i\_teller **IN** 1..*TRUNC*(v\_salary / 1000)

**LOOP**

v\_asterisks := v\_asterisks || '\*';

**END LOOP**;

p\_asterisks := v\_asterisks;

**END**;

Anoniem blok:

**DECLARE**

v\_asterisks **VARCHAR2**(50);

**BEGIN**

*asterisk\_sal*(120, v\_asterisks);

DBMS\_OUTPUT.PUT\_LINE(v\_asterisks);

**END**;

Bind-variabele:

**VARIABLE** b\_asterisks **VARCHAR2**(50)

**EXEC** asterisk\_sal(120, :b\_asterisks)

***Oefening 7:***

**CREATE OR REPLACE PROCEDURE** *landenlijst*

**IS**

v\_aantal **number**(5);

v\_landnaam **varchar2**(50);

v\_kleinste **varchar2**(4);

**BEGIN**

**SELECT** *COUNT*(\*)

**INTO** v\_aantal

**FROM** COUNTRIES;

**SELECT** *MIN*(country\_id)

**INTO** v\_kleinste

**FROM** countries;

**FOR i IN** 1 .. v\_aantal **LOOP**

**SELECT** country\_name

**INTO** v\_landnaam

**FROM** countries

**WHERE** country\_id = v\_kleinste;

DBMS\_OUTPUT.PUT\_LINE(v\_landnaam);

**SELECT** *MIN*(country\_id)

**INTO** v\_kleinste

**FROM** countries

**WHERE** country\_id > v\_kleinste;

**END LOOP**;

DBMS\_OUTPUT.PUT\_LINE('We hebben connecties in '||v\_aantal||' landen.');

**END**;

Cursorloop:

**CREATE OR REPLACE PROCEDURE** *landenlijst\_cursorloop*

**IS**

v\_aantal **NUMBER**(5) := 0;

**BEGIN**

**FOR** lijn **IN** (**SELECT** COUNTRY\_NAME

**FROM** COUNTRIES)

**LOOP**

DBMS\_OUTPUT.PUT\_LINE(lijn.COUNTRY\_NAME);

v\_aantal := v\_aantal + 1;

**END LOOP**;

DBMS\_OUTPUT.PUT\_LINE('We hebben connecties in '||v\_aantal||' landen.');

**END**;

***Oefening 8:***

**CREATE OR REPLACE PROCEDURE** *country\_dept*

(p\_land\_id **IN** COUNTRIES.COUNTRY\_ID%**TYPE**)

**AS**

v\_aantal\_locations **NUMBER**;

v\_aantal\_departementen **NUMBER**;

v\_kleinste\_location LOCATIONS.LOCATION\_ID%**TYPE**;

v\_kleinste\_departement DEPARTMENTS.DEPARTMENT\_ID%**TYPE**;

v\_departement\_naam DEPARTMENTS.DEPARTMENT\_NAME%**TYPE**;

**BEGIN**

**SELECT** *COUNT*(\*)

**INTO** v\_aantal\_locations

**FROM** LOCATIONS

**WHERE** p\_land\_id = COUNTRY\_ID;

**SELECT** *MIN*(location\_id)

**INTO** v\_kleinste\_location

**FROM** LOCATIONS

**WHERE** p\_land\_id = COUNTRY\_ID;

**IF** (v\_kleinste\_location **IS NOT NULL**)

**THEN**

**FOR i IN** 1 .. v\_aantal\_locations **LOOP**

**SELECT** *COUNT*(\*)

**INTO** v\_aantal\_departementen

**FROM** DEPARTMENTS

**WHERE** LOCATION\_ID = v\_kleinste\_location;

**SELECT** *MIN*(DEPARTMENT\_ID)

**INTO** v\_kleinste\_departement

**FROM** DEPARTMENTS

**WHERE** v\_kleinste\_location = LOCATION\_ID;

**FOR i IN** 1 .. v\_aantal\_departementen **LOOP**

**SELECT** department\_name

**INTO** v\_departement\_naam

**FROM** DEPARTMENTS

**WHERE** v\_kleinste\_departement = DEPARTMENT\_ID;

DBMS\_OUTPUT.PUT\_LINE(v\_departement\_naam);

**SELECT** *MIN*(DEPARTMENT\_ID)

**INTO** v\_kleinste\_departement

**FROM** DEPARTMENTS

**WHERE** v\_kleinste\_location = LOCATION\_ID **AND** DEPARTMENT\_ID > v\_kleinste\_departement;

**END LOOP**;

**SELECT** *MIN*(location\_id)

**INTO** v\_kleinste\_location

**FROM** LOCATIONS

**WHERE** LOCATION\_ID > v\_kleinste\_location **AND** p\_land\_id = COUNTRY\_ID;

**END LOOP**;

**ELSE**

DBMS\_OUTPUT.PUT\_LINE('Er zijn geen departementen met dit land\_id!');

**END IF**;

**END**;

***Oefening 9:***

**CREATE OR REPLACE PROCEDURE** *toon\_empl\_en\_verhoog\_sal*

(p\_department\_id EMPLOYEES.DEPARTMENT\_ID%**TYPE**

,p\_percentage\_verhoging **NUMBER**)

**AS**

v\_naam\_dep DEPARTMENTS.DEPARTMENT\_NAME%**TYPE**;

v\_verhoging **NUMBER**;

v\_verhogingen **NUMBER** := 0;

**BEGIN**

--pre

v\_verhoging := p\_percentage\_verhoging / 100;

--Puntje 2

**SELECT** DEPARTMENT\_NAME

**INTO** v\_naam\_dep

**FROM** DEPARTMENTS

**WHERE** DEPARTMENT\_ID = p\_department\_id;

DBMS\_OUTPUT.PUT\_LINE('Het gekozen departement is: ' || *TO\_CHAR*(v\_naam\_dep));

**FOR** employee **IN** (**SELECT** LAST\_NAME, EMPLOYEE\_ID, SALARY

**FROM** EMPLOYEES

**WHERE** DEPARTMENT\_ID = p\_department\_id) **LOOP**

DBMS\_OUTPUT.PUT\_LINE(employee.LAST\_NAME || ' ' || employee.EMPLOYEE\_ID || ' ' || employee.SALARY);

--Puntje 3

**UPDATE** EMPLOYEES **SET** SALARY = (employee.SALARY \* v\_verhoging) + employee.SALARY **WHERE** EMPLOYEE\_ID = employee.EMPLOYEE\_ID;

v\_verhogingen := v\_verhogingen + 1;

**END LOOP**;

--Puntje 4

DBMS\_OUTPUT.PUT\_LINE('');

DBMS\_OUTPUT.PUT\_LINE('Aantal salarisverhogingen: ' || v\_verhogingen);

--Puntje 5

DBMS\_OUTPUT.PUT\_LINE('SITUATIE NA WIJZIGING');

**FOR** employee **IN** (**SELECT** LAST\_NAME, EMPLOYEE\_ID, SALARY

**FROM** EMPLOYEES

**WHERE** DEPARTMENT\_ID = p\_department\_id) **LOOP**

DBMS\_OUTPUT.PUT\_LINE(employee.LAST\_NAME || ' ' || employee.EMPLOYEE\_ID || ' ' || employee.SALARY);

**END LOOP**;

**END**;

***Oefening 10:***

**CREATE OR REPLACE PROCEDURE** *toon\_steden*

(p\_land\_id LANDEN.LAND\_ID%**TYPE**)

**AS**

v\_land\_naam LANDEN.LANDNAAM%**TYPE**;

v\_aantal\_empl **NUMBER**;

**BEGIN**

**SELECT** LANDNAAM

**INTO** v\_land\_naam

**FROM** LANDEN

**WHERE** LAND\_ID = p\_land\_id;

**FOR** locations **IN** (**SELECT** LOCATION\_ID, CITY **FROM** LOCATIONS **WHERE** COUNTRY\_ID = p\_land\_id) **LOOP**

DBMS\_OUTPUT.PUT\_LINE('==> ' || v\_land\_naam || ' - ' || locations.LOCATION\_ID || ' ' || locations.CITY);

**FOR** departments **IN** (**SELECT** DEPARTMENT\_ID, DEPARTMENT\_NAME **FROM** DEPARTMENTS **WHERE** LOCATION\_ID = locations.LOCATION\_ID) **LOOP**

v\_aantal\_empl := 0;

**FOR** employees **IN** (**SELECT** EMPLOYEE\_ID **FROM** EMPLOYEES **WHERE** DEPARTMENT\_ID = departments.DEPARTMENT\_ID) **LOOP**

v\_aantal\_empl := v\_aantal\_empl + 1;

**end loop**;

**IF** v\_aantal\_empl != 0 **THEN**

DBMS\_OUTPUT.PUT\_LINE(departments.DEPARTMENT\_NAME || ': ' || *TO\_CHAR*(v\_aantal\_empl) || ' werknemers');

**end if**;

**end loop**;

**END LOOP**;

**END**;