Universidad Autónoma de Chihuahua

Facultad de ingeniería

Computo Paralelo y Distribuido

3.25 Proyecto 2a. Evaluación

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Grupo: 8CC2

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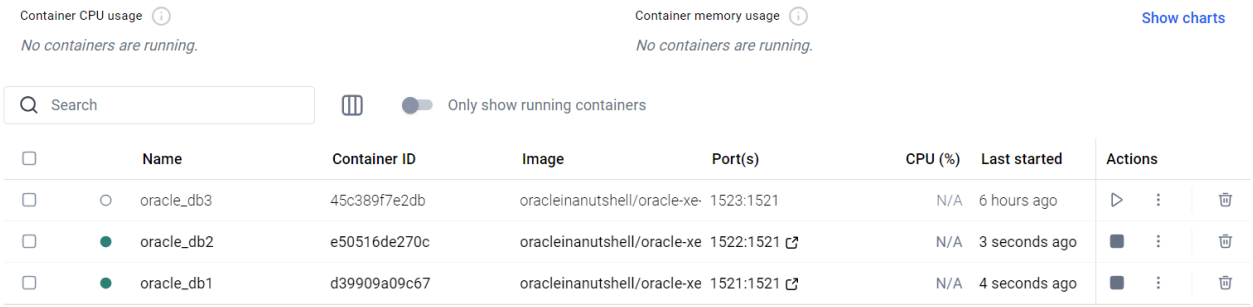
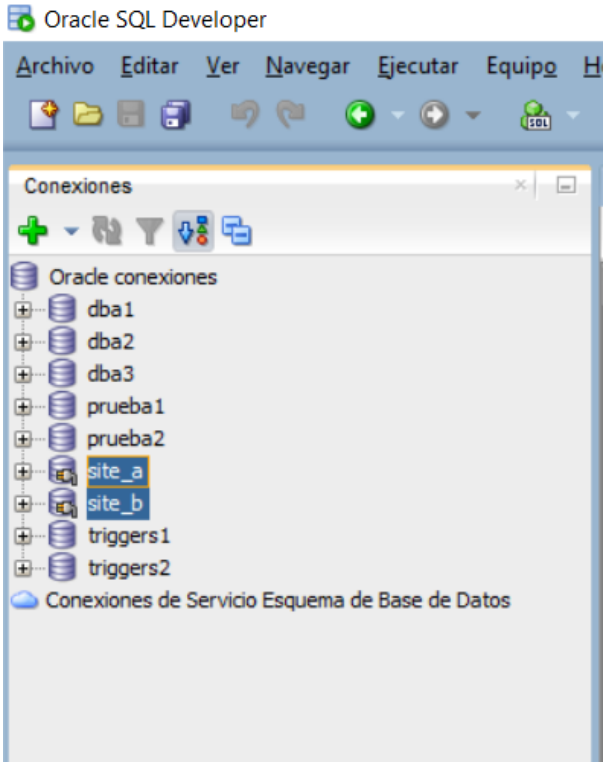
Crear una base de datos distribuida para un Sistema Bancario, utilizando el servidor de base de datos Oracle

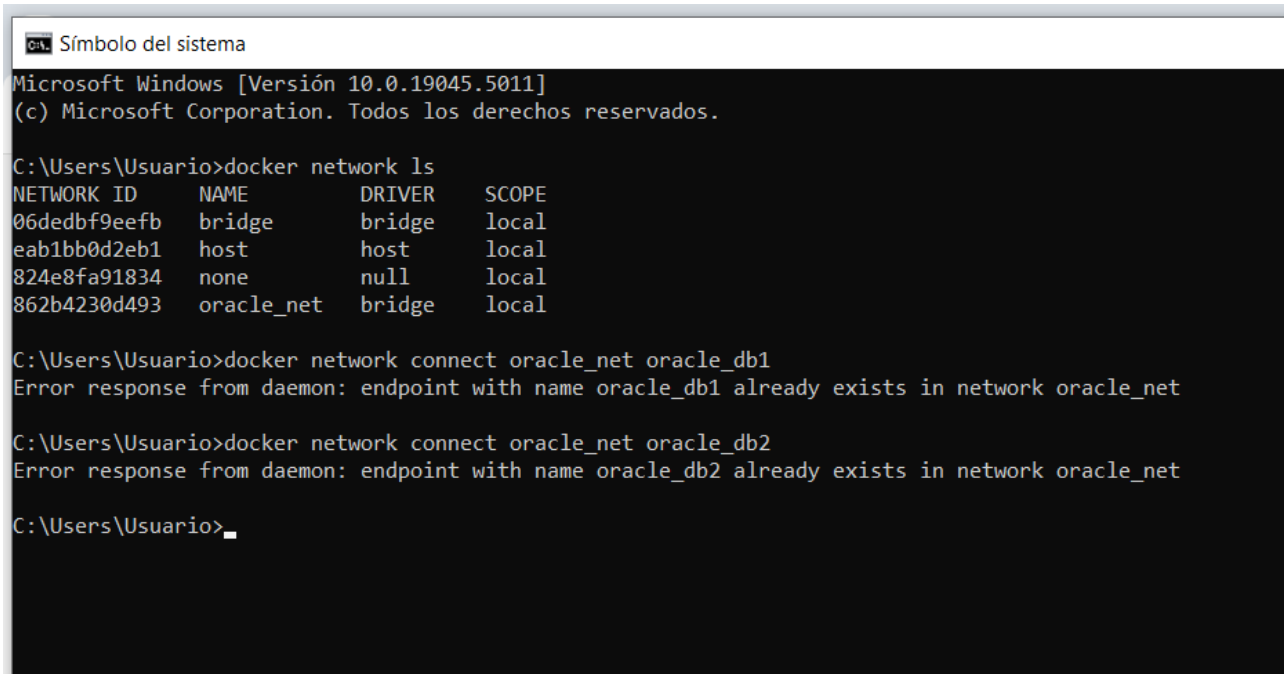
Operaciones:

1. Instalación de dos servidores de base de datos Oracle (Virtuales/Docker)(Site A y B)





2. Site A y B => Crear un servicio de Oracle entre cada uno de los servidores (opcional)



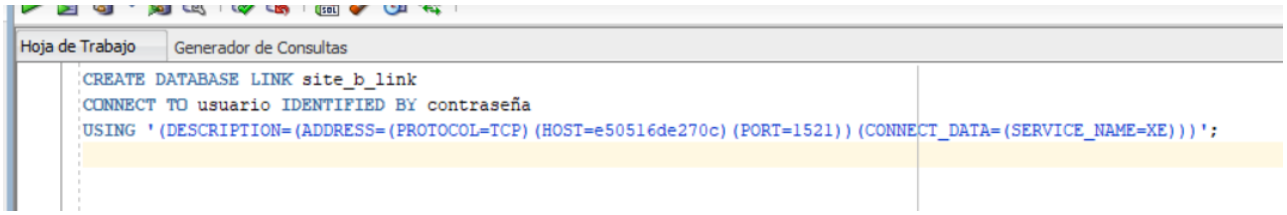
3. Site A y B => Crear un database link entre cada uno de los servidores

site_a:

CREATE DATABASE LINK site_b_link

CONNECT TO usuario IDENTIFIED BY contraseña

USING
'(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=e50516de270c)(PORT=1521))
(CONNECT_DATA=(SERVICE_NAME=XE)))';

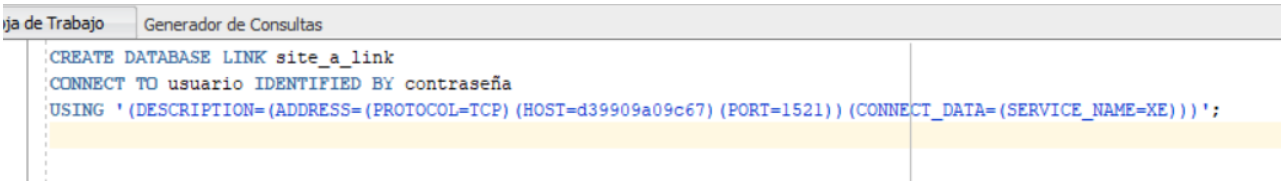


site_b:

CREATE DATABASE LINK site_a_link

CONNECT TO usuario IDENTIFIED BY contraseña

USING
'(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=d39909a09c67)(PORT=1521))
(CONNECT_DATA=(SERVICE_NAME=XE)))';

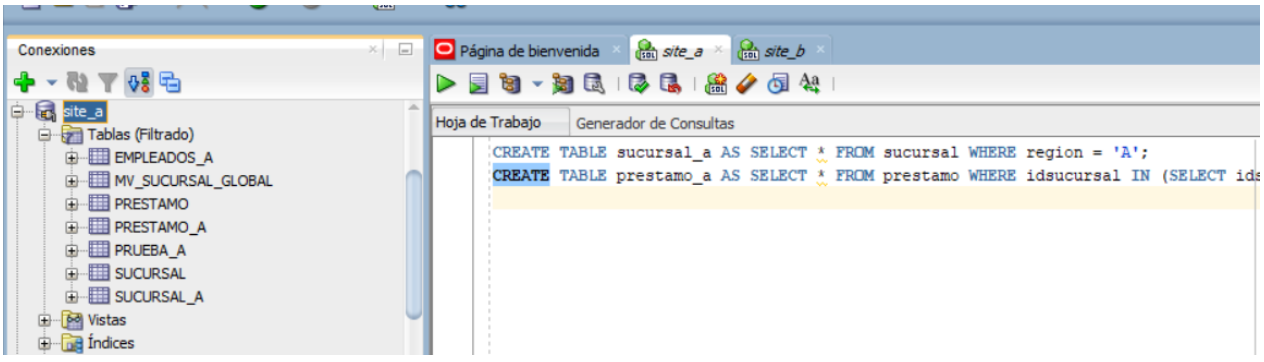


4. Fragmentar las tablas de sucursales(branch) y prestamos(loan), el criterio de fragmentación: región.5. Asignar los fragmentos de la región 1 en Site A y de la región 2 en el Site B

Site_a:

CREATE TABLE sucursal_a AS SELECT * FROM sucursal WHERE region = 'A';

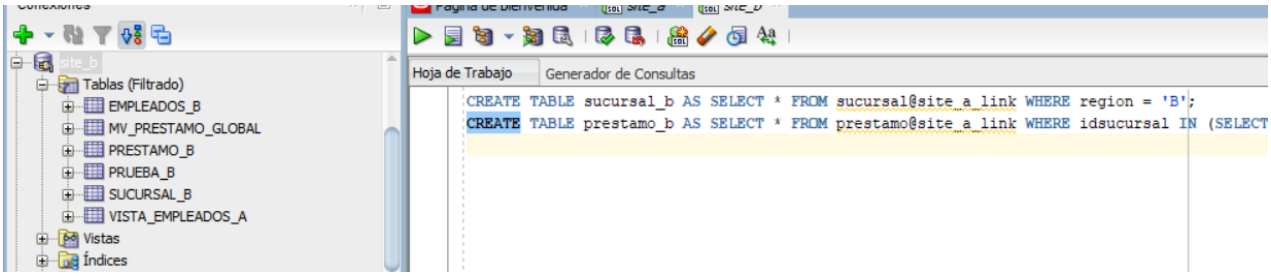
CREATE TABLE prestamo_a AS SELECT * FROM prestamo WHERE idsucursal IN (SELECT idsucursal FROM sucursal WHERE region = 'A');



Site_b (usando el database link):

CREATE TABLE sucursal_b AS SELECT * FROM sucursal@site_a_link WHERE region = 'B';

CREATE TABLE prestamo_b AS SELECT * FROM prestamo@site_a_link WHERE idsucursal IN (SELECT idsucursal FROM sucursal@site_a_link WHERE region = 'B');



6. Site A y B => Crear una vista global de las tablas sucursales(branch) y loan(prestamos)

Site_a

CREATE VIEW sucursal_global AS

SELECT * FROM sucursal_a

UNION ALL

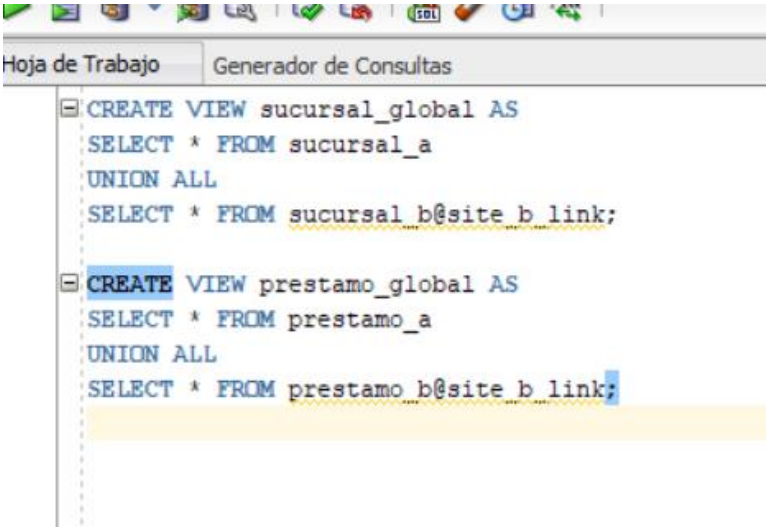
SELECT * FROM sucursal_b@site_b_link;

CREATE VIEW prestamo_global AS

SELECT * FROM prestamo_a

UNION ALL

SELECT * FROM prestamo_b@site_b_link;



Site_b

CREATE VIEW sucursal_global AS

SELECT * FROM sucursal_a@site_a_link

UNION ALL

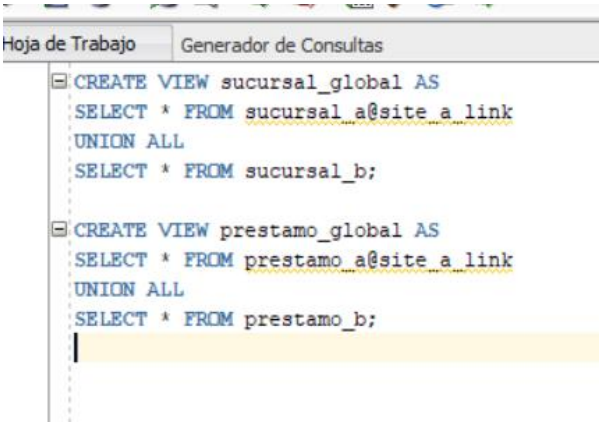
SELECT * FROM sucursal_b;

CREATE VIEW prestamo_global AS

SELECT * FROM prestamo_a@site_a_link

UNION ALL

SELECT * FROM prestamo_b;

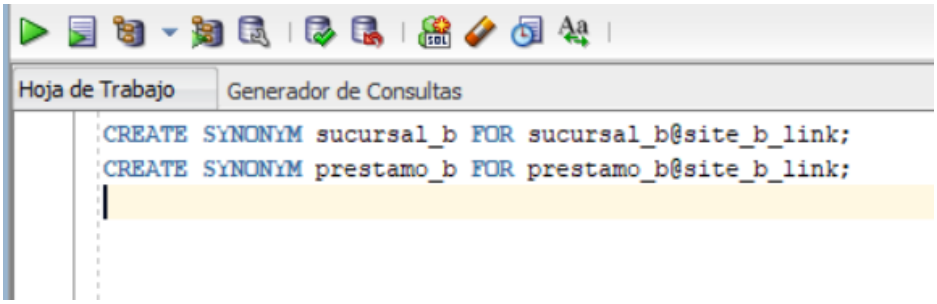


7. Site A y B => Crear un sinónimo para cada fragmento

Site_a

CREATE SYNONYM sucursal_b FOR sucursal_b@site_b_link;

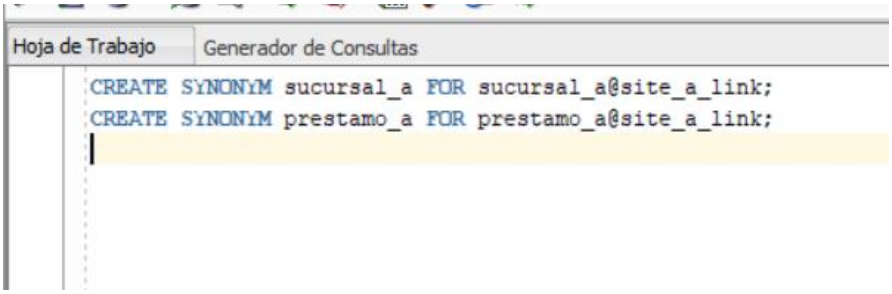
CREATE SYNONYM prestamo_b FOR prestamo_b@site_b_link;



Site_b

CREATE SYNONYM sucursal_a FOR sucursal_a@site_a_link;

CREATE SYNONYM prestamo_a FOR prestamo_a@site_a_link;



8. Site A y B => Crear un procedimiento almacenado que permita dar de alta sucursales(branch) en el Site A o B dependiendo a que región pertenezca

```
CREATE OR REPLACE PROCEDURE alta_sucursal(
   p_idsucursal VARCHAR2,
   p_nombre VARCHAR2,
   p_ciudad VARCHAR2,
   p_activos NUMBER,
   p_region VARCHAR2
) AS
BEGIN
   IF p_region = 'A' THEN
      INSERT INTO sucursal_a VALUES (p_idsucursal, p_nombre, p_ciudad, p_activos, p_region);
   ELSE
      INSERT INTO sucursal_b@site_b_link VALUES (p_idsucursal, p_nombre, p_ciudad, p_activos, p_region);
   END IF;
END;
/
```

9. Site A y B => Crear un procedimiento almacenado que permita dar de alta prestamos(loan) en el site A o B dependiendo de qué sucursal otorgo el préstamo

```
CREATE OR REPLACE PROCEDURE alta_prestamo(
   p_noprestamo VARCHAR2,
   p_idsucursal VARCHAR2,
   p_cantidad NUMBER
) AS
   v_region VARCHAR2(2);
BEGIN
   SELECT region INTO v_region FROM sucursal WHERE idsucursal = p_idsucursal;

   IF v_region = 'A' THEN
      INSERT INTO prestamo_a VALUES (p_noprestamo, p_idsucursal, p_cantidad);
   ELSE
      INSERT INTO prestamo_b@site_b_link VALUES (p_noprestamo, p_idsucursal, p_cantidad);
   END IF;
END;
/
```

10. Site A y B => Crear un trigger para cada fragmento, que permita replicarlo en el servidor remoto

Site_a (Replicando a site_b)

```
CREATE OR REPLACE TRIGGER replicar_sucursal

AFTER INSERT ON sucursal_a

FOR EACH ROW

BEGIN

  INSERT INTO sucursal_b@site_b_link VALUES (:NEW.idsucursal, :NEW.nombresucursal, :NEW.ciudadsucursal, :NEW.activos, :NEW.region);

END;

/
```

11. Site A => Crear una vista materializada que recostruya la tabla global de sucursales(branch)

```
CREATE MATERIALIZED VIEW mv_sucursal_global AS

SELECT * FROM sucursal_global;
```

12. Site B => Crear una vista materializada que reconstruya la tabla global de préstamos(loan)

```
CREATE MATERIALIZED VIEW mv_prestamo_global AS

SELECT * FROM prestamo_global;
```

13. Site A => Crear una vista que obtenga la cantidad total otorgada en préstamos por sucursal

CREATE VIEW total_prestamos_por_sucursal AS

SELECT idsucursal, SUM(cantidad) AS total_prestamos

FROM prestamo_global

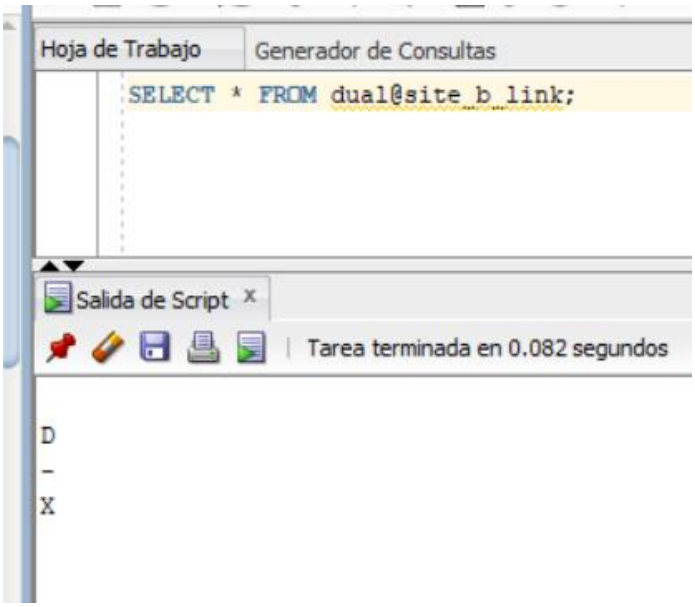
GROUP BY idsucursal;

Comandos para verificar

Database link

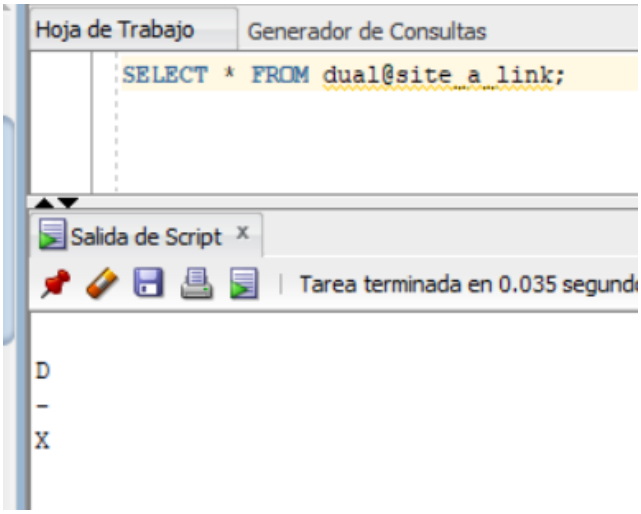
Site_a

SELECT * FROM dual@site_b_link;



Site_b

SELECT * FROM dual@site_a_link;

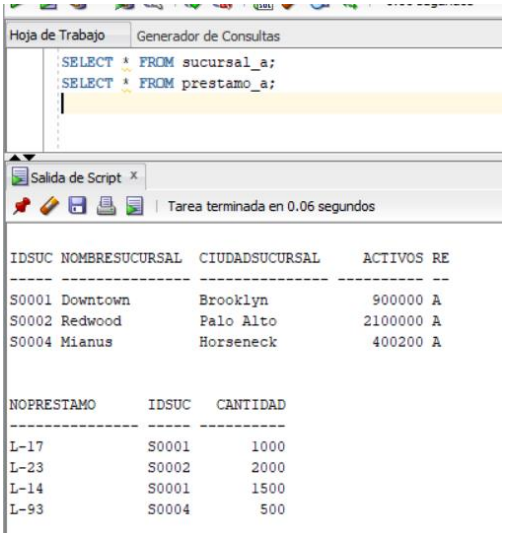


Consultar tablas fragmentadas:

Site_A

SELECT * FROM sucursal_a;

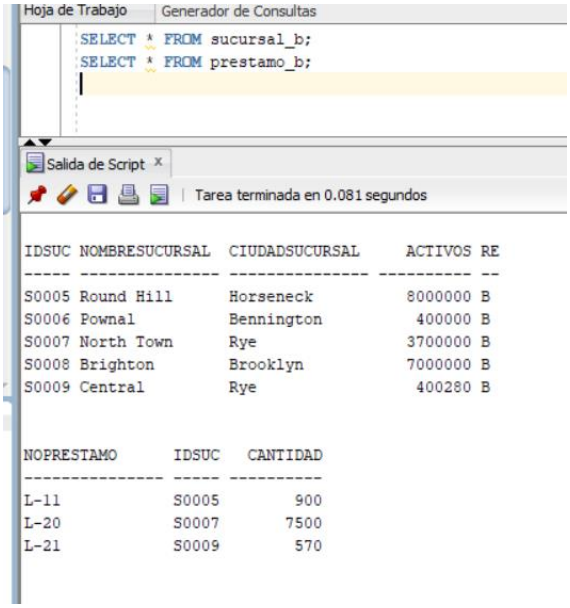
SELECT * FROM prestamo_a;



Site_b

SELECT * FROM sucursal_b;

SELECT * FROM prestamo_b;

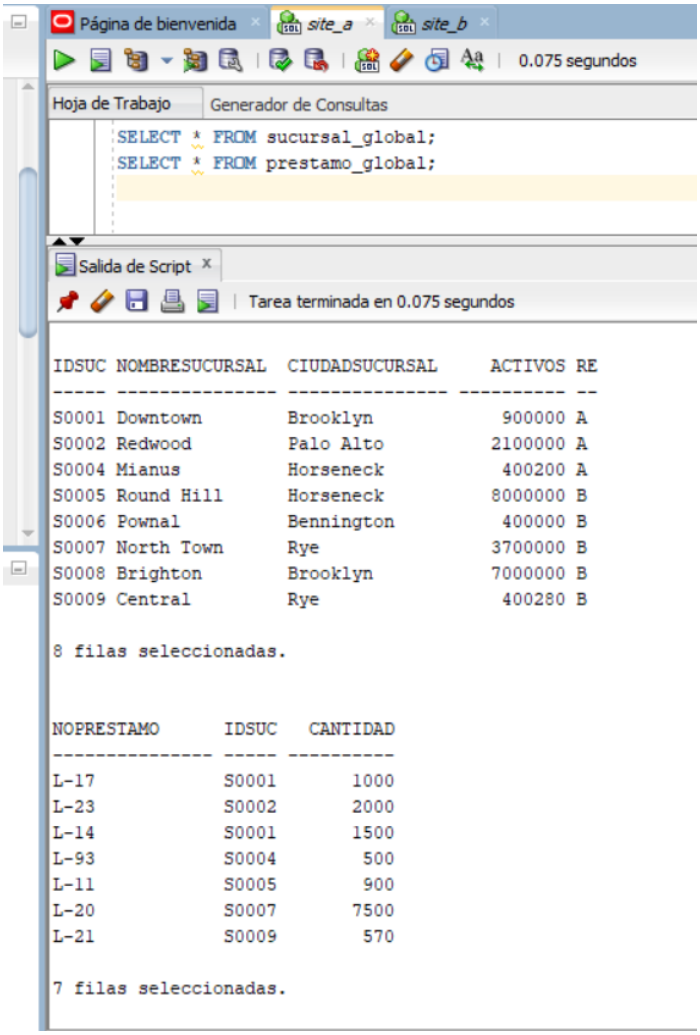


Consultar las vistas globales:

Site_a

SELECT * FROM sucursal_global;

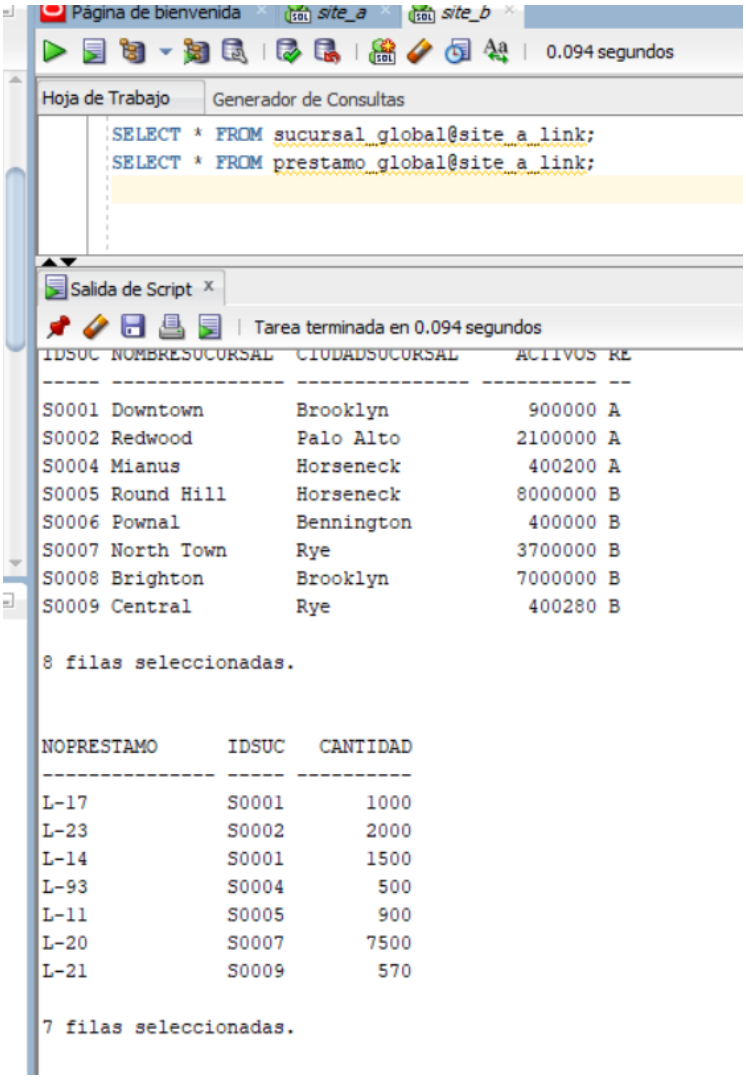
SELECT * FROM prestamo_global;



Site_b

SELECT * FROM sucursal_global@site_a_link;

SELECT * FROM prestamo_global@site_a_link;

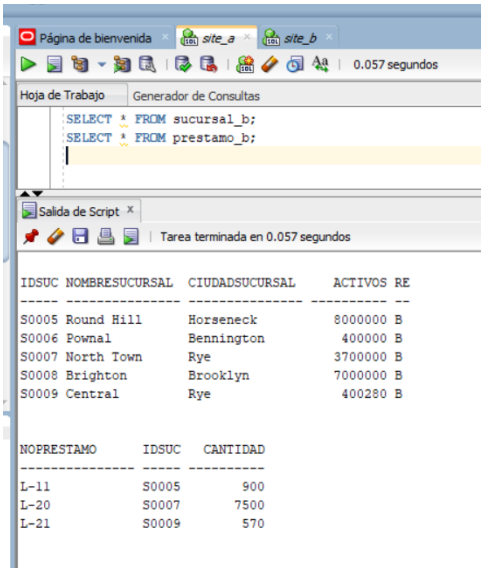


Verificar los sinónimos

Site_a

SELECT * FROM sucursal_b;

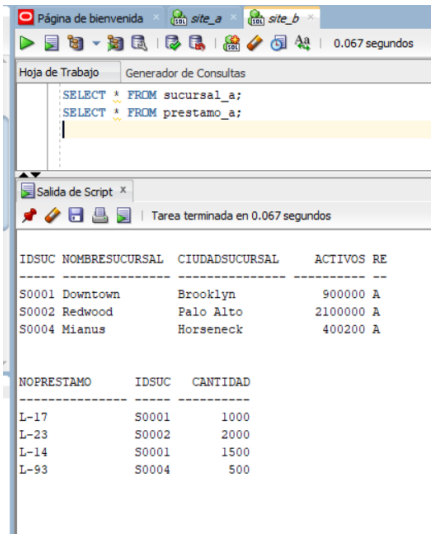
SELECT * FROM prestamo_b;



Site_b

SELECT * FROM sucursal_a;

SELECT * FROM prestamo_a;



Procedimientos almacenados:

Para insertar una nueva sucursal

Site_a

BEGIN alta_sucursal('S0010', 'Branch1', 'New City', 500000, 'A');

END;

/

Site_b

BEGIN alta_sucursal('S0011', 'Branch2', 'Minessota', 300000, 'B');

END;

/

Para insertar un nuevo préstamo

BEGIN

alta_prestamo('L-99', 'S0001', 2500);

END;

/

Verificar triggers

Inserta en sucursal_a en site_a y verifica en sucursal_b en site_b

INSERT INTO sucursal_a VALUES ('S0012', 'Test Branch', 'Test City', 400000, 'A');

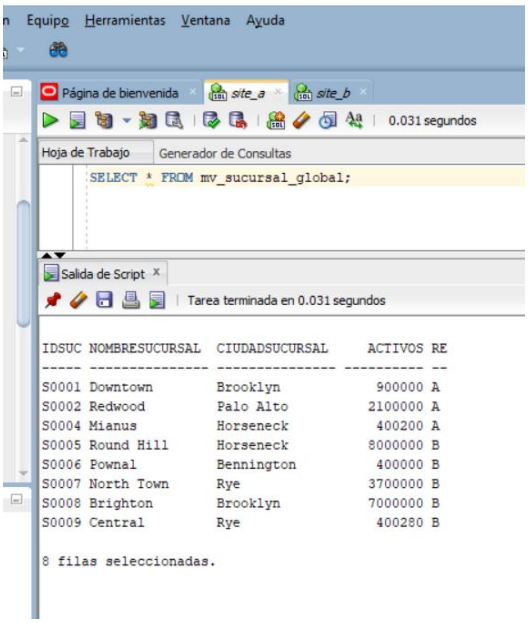
En site_b:

SELECT * FROM sucursal_b WHERE idsucursal = 'S0012';

Vista materializada

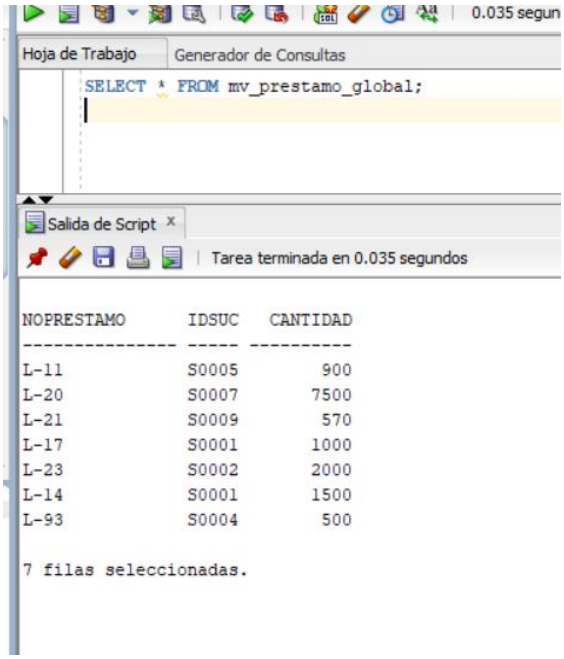
Site_a

SELECT * FROM mv_sucursal_global;



Site_b

SELECT * FROM mv_prestamo_global;



Vista:

Site_a

SELECT * FROM total_prestamos_por_sucursal;