Lab8

Objectives:
At the end of this lab, you should be able to

- Create, and test triggers.
- Use ERDPlus tool to draw ER diagrams, and relational schema.

Oracle Triggers:

Oracle allows you to define procedures that are implicitly executed when an INSERT, UPDATE, or DELETE statement is issued against the associated table. These procedures are called database triggers. Triggers are similar to stored procedures, discussed in Lab 7. A trigger can include SQL and PL/SQL statements to execute as a unit and can invoke stored procedures. However, procedures and triggers differ in the way that they are invoked. While a procedure is explicitly executed by a user, application, or trigger, one or more triggers are implicitly fired (executed) by Oracle when a triggering INSERT, UPDATE, or DELETE statement is issued, no matter which user is connected or which application is being used.

Example

```
CREATE OR REPLACE TRIGGER T1
        AFTER INSERT ON EMP
        FOR EACH ROW
BEGIN
        DBMS_OUTPUT.PUT_LINE('NEW RECORD INSERTED');
END;
```

Now try to insert a new record to table EMP. (Note: to get the output of DBMS_OUTPUT, you should use the command SET SERVEROUTPUT ON.

Triggers Types:

The trigger type determines whether the cod in the trigger executes for each row or only once for the triggering statement.

- A statement trigger:

Executes once for the triggering event
Is the default type of trigger
Fires once even if no rows are affected at all

- A row trigger:

Executes once for each row affected by the triggering event
Is not executed if the triggering event does not affect any rows
Is indicated by specifying the FOR EACH ROW clause

Prepared by : Dr. Saleh Alhazbi

Triggers Timing:

- BEFORE: Execute the trigger body before the triggering DML event on a table.
- AFTER: Execute the trigger body after the triggering DML event on a table.
- INSTEAD OF: Execute the trigger body instead of the triggering statement. This is used for views that are not modifiable.

Note: If multiple triggers are defined for the same object, then the order of firing triggers is arbitrary.

Example

```
CREATE OR REPLACE TRIGGER T2
AFTER INSERT ON EMP
FOR EACH ROW
BEGIN
        IF :NEW.HIREDATE-SYSDATE<30 THEN
                RAISE  APPLICATION  ERROR(-20001,'HIREDATE CAN NOT BE BEFORE 30 DAYS');
        END IF;
END;
```

Now try to insert a new employee whose hire date a year ago.

To log insert operations on table EMP, we will create table AUDITEMP that saves data about user who insert new records, date of insertion, and the number of the new employee.

```
CREATE TABLE AUDITEMP (
        USERNAME VARCHAR2(20),
        OPDATE DATE,
        EMPNO NUMBER(4));
```

The trigger is :

```
        CREATE OR REPLACE TRIGGER LOGINSERT
        AFTER INSERT ON EMP
        FOR EACH ROW
        BEGIN
                INSERT INTO AUDITEMP VALUES(USER,SYSDATE,:NEW.EMPNO);
        END;
```

Now try to insert a new employee

```
        Insert into EMP( EMPNO, ENAME) VALUES (333,'AHMED');
```

Now query the table AUDITEMP

Disable and Enable Triggers

To disable a trigger

ALTER TRIGGER T1 DISABLE;

To enable a trigger

ALTER TRIGGER T1 ENABLE;

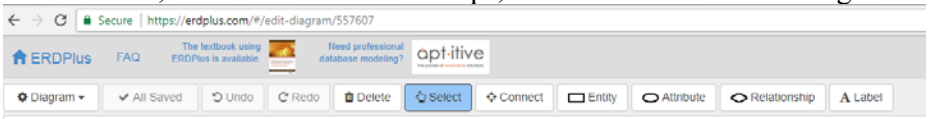
To remove a trigger

DROP TRIGGER T1;

ERDPlus

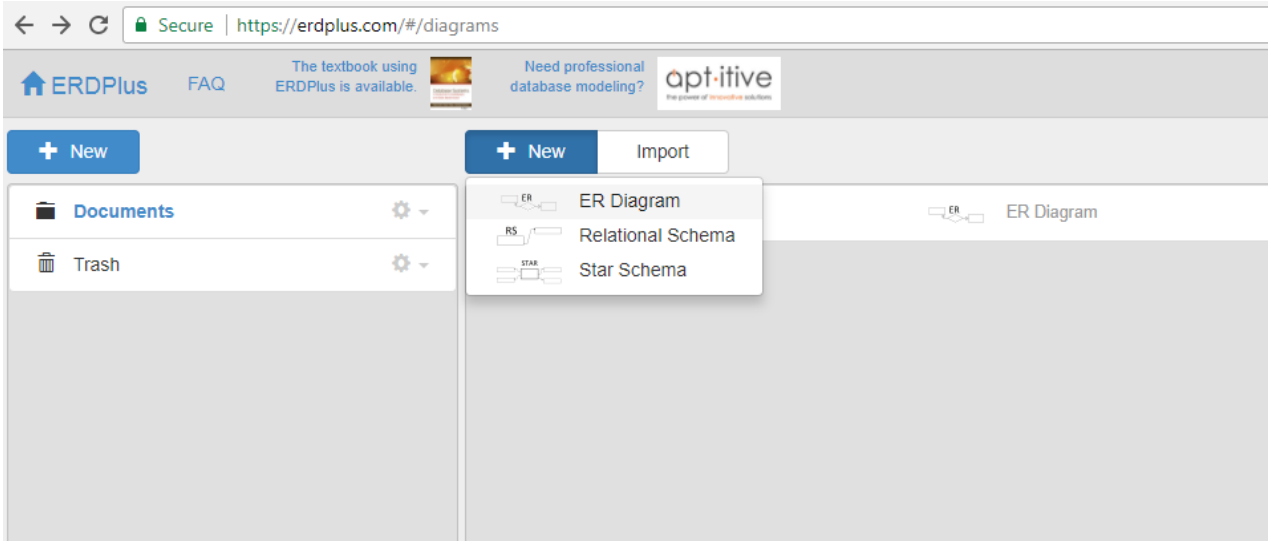
It is a database modeling tool for creating Entity Relationship Diagrams, Relational Schemas, and SQL DDL statements. It can be found at https://erdplus.com

The ERDPlus component for drawing ER diagrams is shown below. It provides users with the ability to draw entities, attributes and relationships, which are the basic building blocks of ER diagrams.

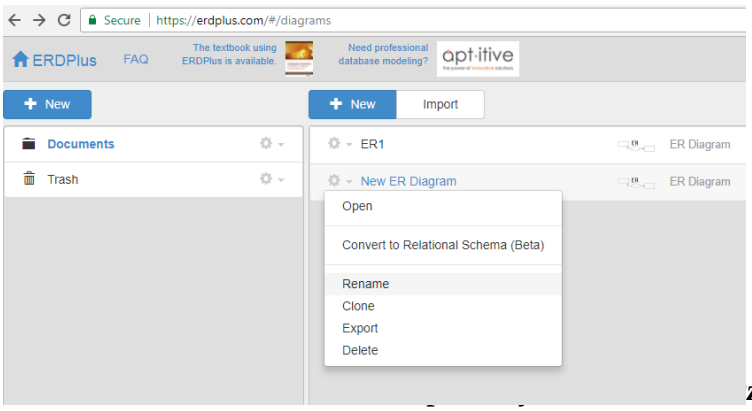


Creating ER diagram:

To start a new ER diagram, select new , and select ER Diagram

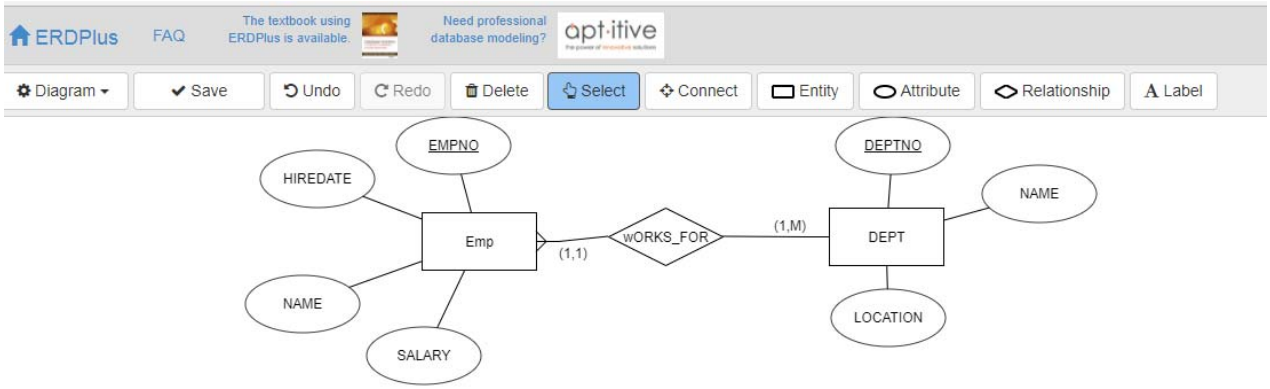


ERDPlus gives a default name, you can change the name

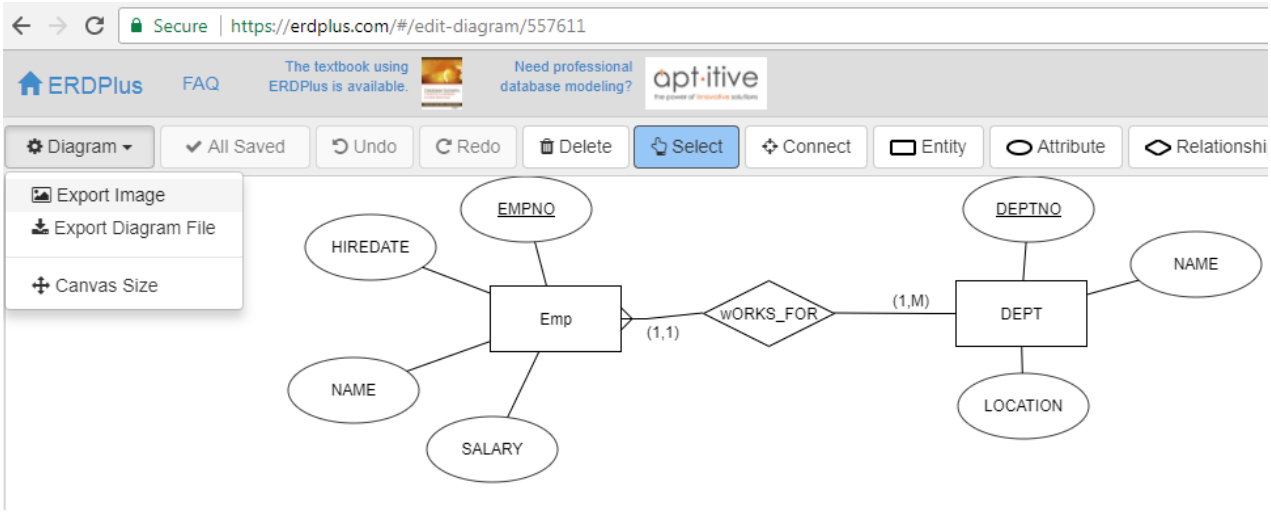


zbi

Rename this project “Company”, and draw the following diagram

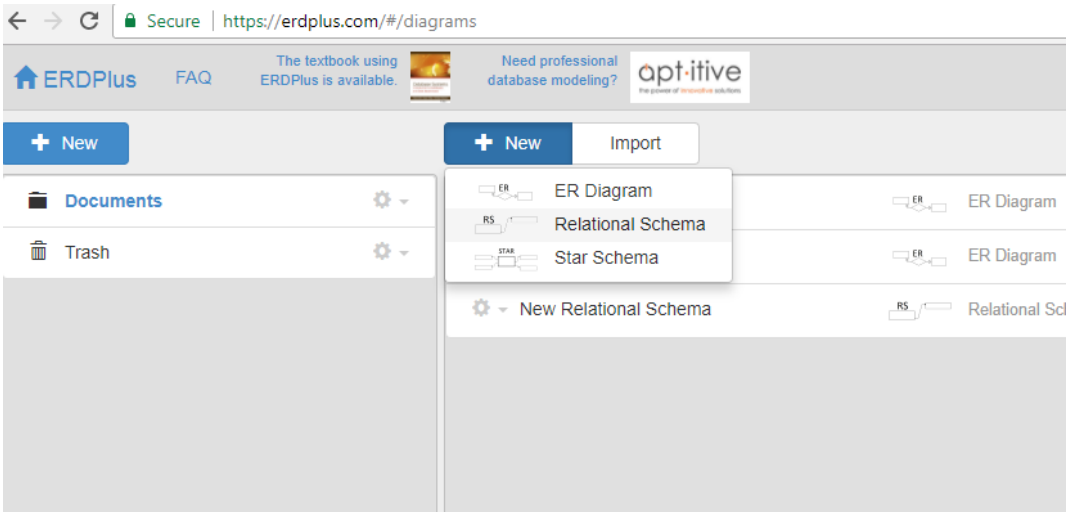


You can export the ER diagram as an image or save it as Diagram file.

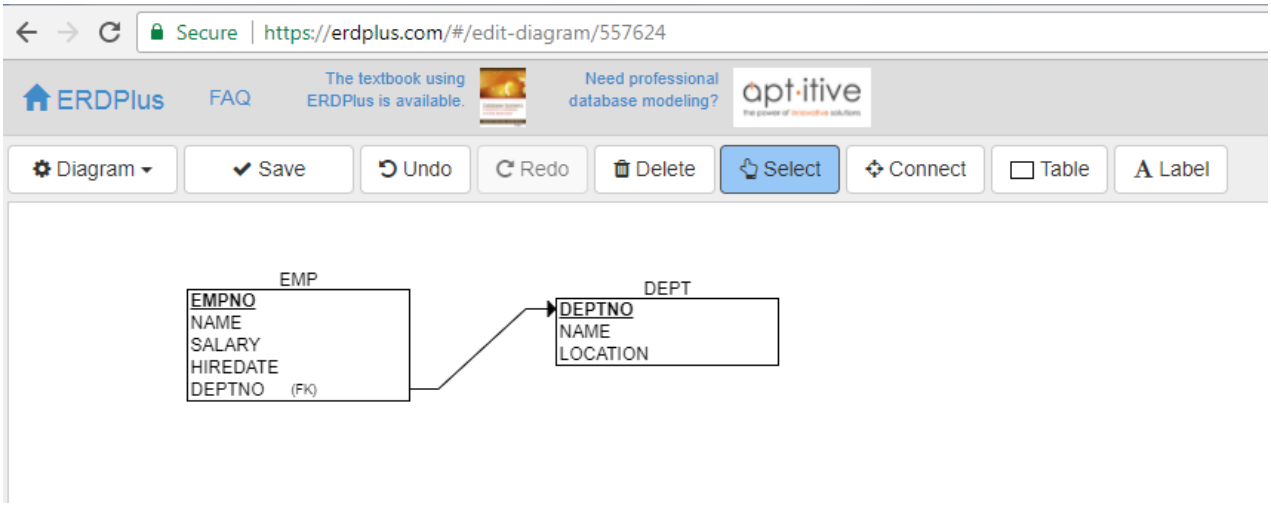


Creating ER Relational Schema:

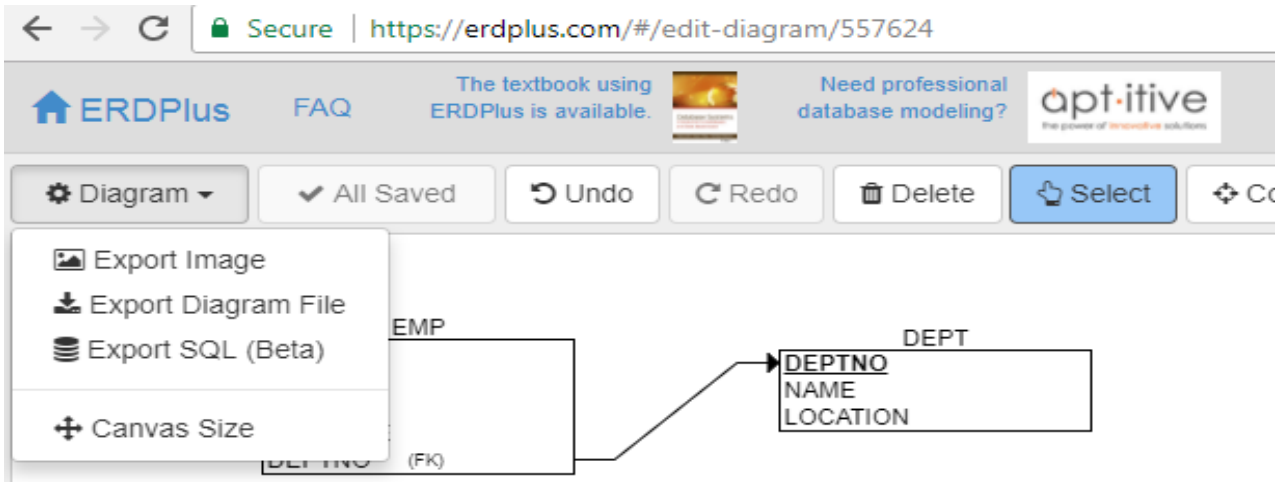
To create a relational Schema, select “New” then select “Relational Schema”



Rename the project "Company", and draw the following schema.



You can export the schema an image, or save it as Diagram file, or get the corresponding SQL command.



Export SQL

Beta: Please email problems, questions, or suggestions to info@erdplus.com.

```
CREATE TABLE DEPT
(
  DEPTNO INT NOT NULL,
  NAME VARCHAR(20) NOT NULL,
  LOCATION VARCHAR(10) NOT NULL,
  PRIMARY KEY (DEPTNO)
);

CREATE TABLE EMP
(
  EMPNO INT NOT NULL,
  NAME VARCHAR(20) NOT NULL,
  SALARY NUMERIC(8,2) NOT NULL,
  HIREDATE DATE NOT NULL,
  DEPTNO INT NOT NULL,
  PRIMARY KEY (EMPNO),
```

Copy Close