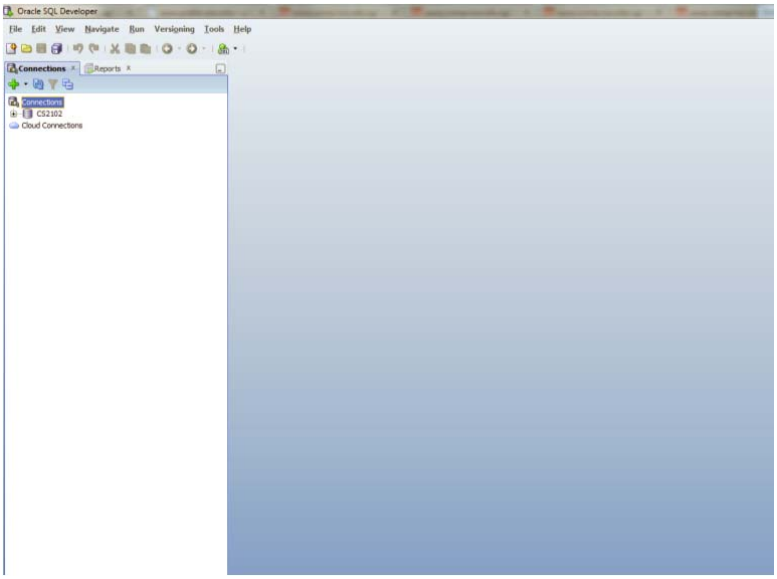
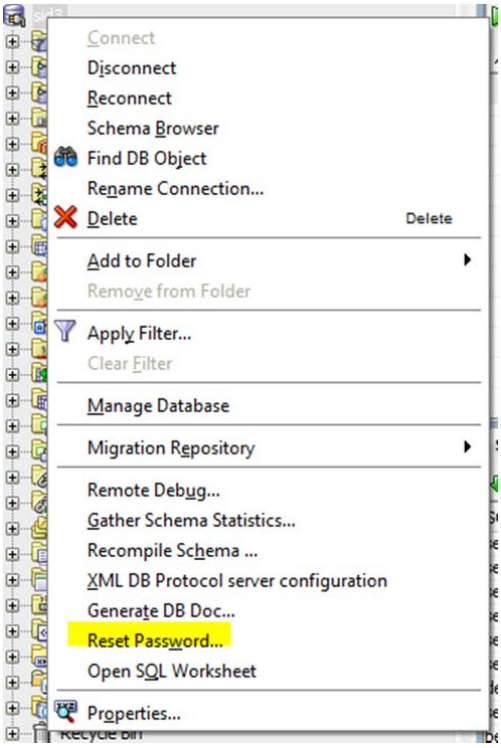
Tutorial 1 (Week3): SQL

Open Oracle SQL Developer by double clicking on the icon or on sqldeveloper.exe on the desktop of the tutorial machine. You see the following window.



Change your password if it is the first time you are connecting. Use SQLDeveloper menus

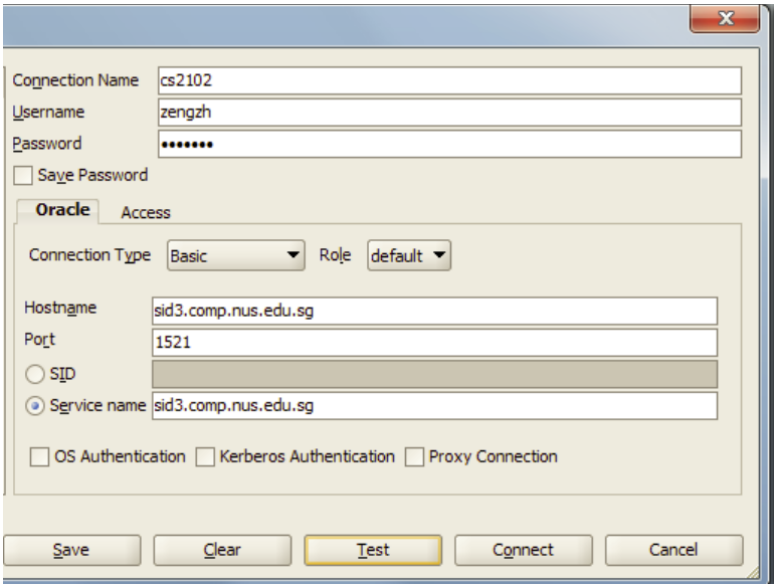


You can also type the following SQL Database Control Language (DCL) command below, where `<username>` is your Oracle username and `<newpassword>` is your new password.

```
ALTER USER <username> IDENTIFIED BY <newpassword>;
```

Create a new connection or open an existing connection. Use the userid and password that were sent to you.

To create a new connection, you need to give it a connection name of your choice and to indicate the hostname and service name to be “sid3.comp.nus.edu.sg”.



The case: NUNStA Online Book Exchange

Students at the National University of Ngendipura (NUN) buy books for their studies. They also lend to and borrow books from other students. Your company, Apasaja Pt. Ltd., is commissioned by NUN Students Association (NUNStA) to design and implement an online book exchange system for its members.

Apasaja Pt. Ltd. designs and implements a database application that records information about students, books that they own and books that they borrow from other students.

The database records the name, email, faculty, and department of each student. Each student is identified in the system by her email. The database also records the date at which the student joined the university.

The database records the title, number of pages, format, language, authors, publisher, year and the ISBN-10 and ISBN-13 for each book. The International Standard Book Number, ISBN-10 or -13, is an industry standard for the unique identification of books. It is possible that the database records books that are not owned by any students (because the owners of a copy graduated or because the book was advised by a lecturer for a course but not yet purchased by any student.)

The database records the date at which a book copy is borrowed and the date at which it is returned. We will refer to this information as a loan record.

For historical purposes the database records information about the copies and the owners of copies as long as the owners are students or there are loan records concerning the copies.

For historical purposes the database records information about graduated students as long as there are loan records concerning books that they owned.

For historical purposes (in order to keep the loan records for this book) the database records the case of a book that was owned and subsequently sold unless the copy was never borrowed.

Tutorial 1

Question 1. Create a table `book` that contains information about books (title, format, language, number of pages, authors, publisher, year, ISBN-10 and 13). Choose appropriate domains for the columns (see, for instance, http://www.w3schools.com/sql/sql_datatypes_general.asp). Choose a primary key. Forbid null values for the title and ISBN-10 and 13.

Use the following command to define the session's date format to YYYY-MM-DD

```
ALTER SESSION SET NLS_DATE_FORMAT='YYYY-MM-DD';
```

Question 2. Search www.amazon.com for the details of books titled "An Introduction to Database Systems" by C.J. Date. There are several editions. Insert 3 or 4 of them into the table book. Insert a couple of other books of your choice.

Question 3. Print all the books in the table `book`.

Question 4. Change the initial C. in C.J. Date to the actual first name of the author (find his actual first name on his Wikipedia page). (Print all the books in the table book to check.)

Question 5. Delete the paperbacks (format). (Print all the books in the table book to check.)

Question 6. Drop the table `book`.

Question 7. Download the following files from IVLE Workbin "Tutorials/SQL (tutorials 1, 2 and 3)": `NUNStASchema.sql, NUNStABook.sql, NUNStAStudent.sql, NUNStACopy.sql, NUNStALoan.sql and NUNStAClean.sql`

Open the files with a text editor and take a look at the SQL code. The SQL script `NUNStASchema.sql` creates the four tables. The SQL script `NUNStABook.sql` inserts the book data. The SQL script `NUNStAtudent.sql` inserts the student data. The SQL script `NUNStACopy.sql` inserts the copy data. The SQL script `NUNStALoan.sql` inserts the loan data. The SQL script `NUNStAClean.sql` drops the four tables in case you want to start again from an empty database.

Make sure that you read and understand the SQL Data Definition Language (DDL) statements in `NUNStASchema.sql` in order to answer the following questions.

Question 8. What are the primary keys of the different tables? Propose an insertion or an update that violates their primary key of the tables `book` and `loan`. Do not insert an existing row.

Question 9. What are the foreign keys? Choose a foreign key. Propose an insertion, an update and a deletion that violates it.

Question 10. Are there other integrity constraints? Can you propose operations that violate them?