

Databases 1

Laboratory 1

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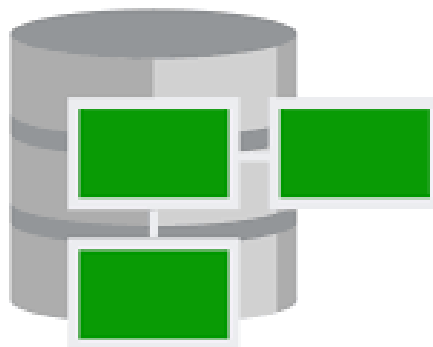
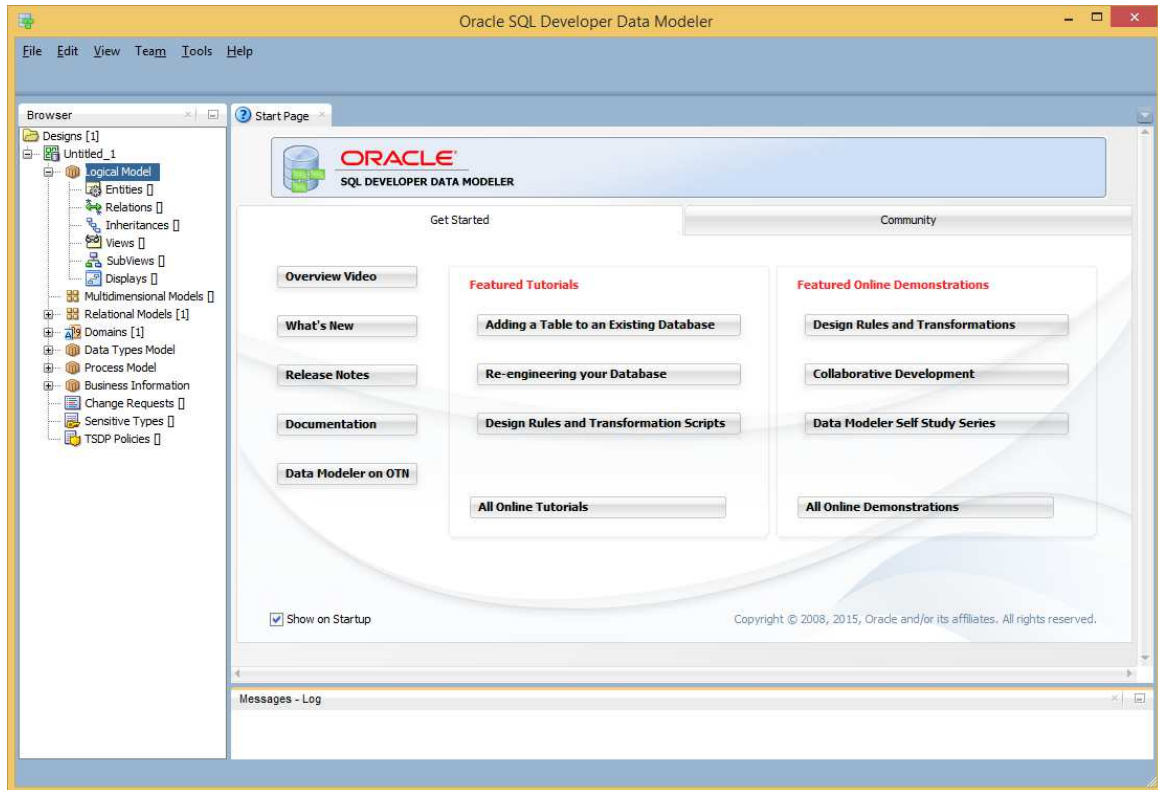
Oracle SQL Data Modeler

Oracle SQL Developer Data Modeler homepage:

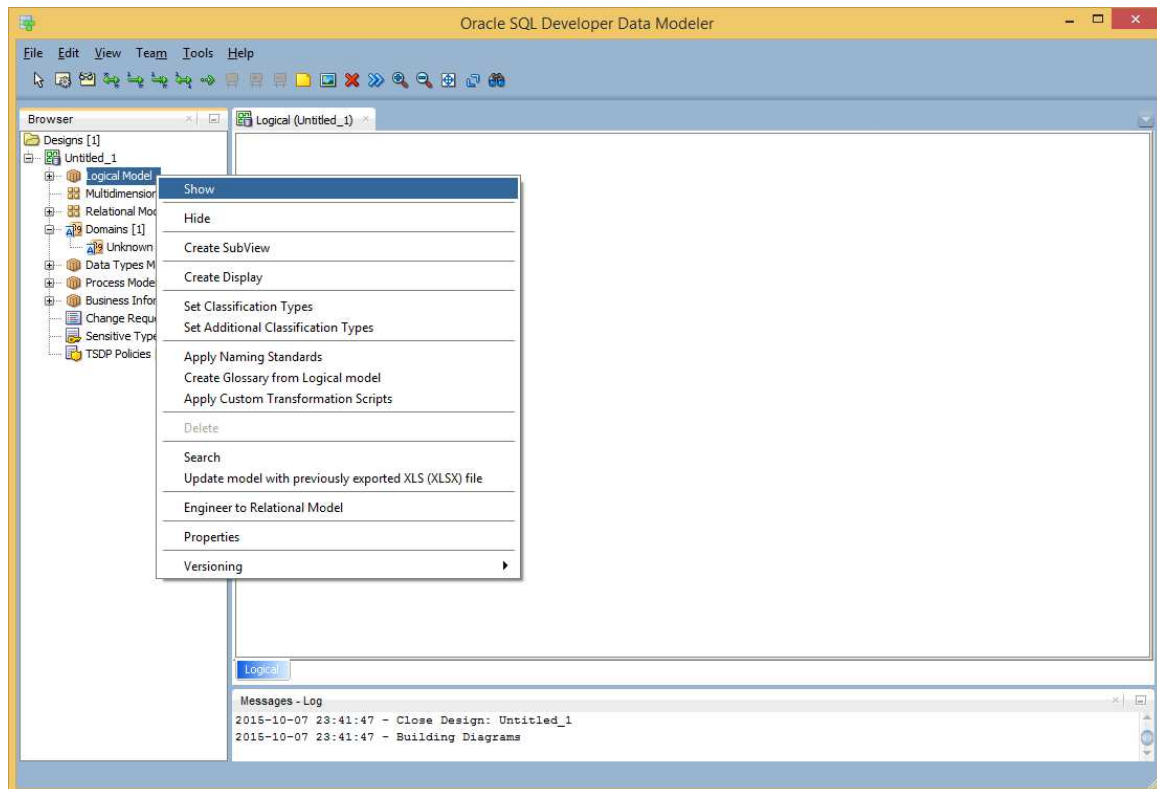
<https://www.oracle.com/pl/database/technologies/appdev/datamodeler.html>

Documentation of Oracle SQL Developer Data Modeler:

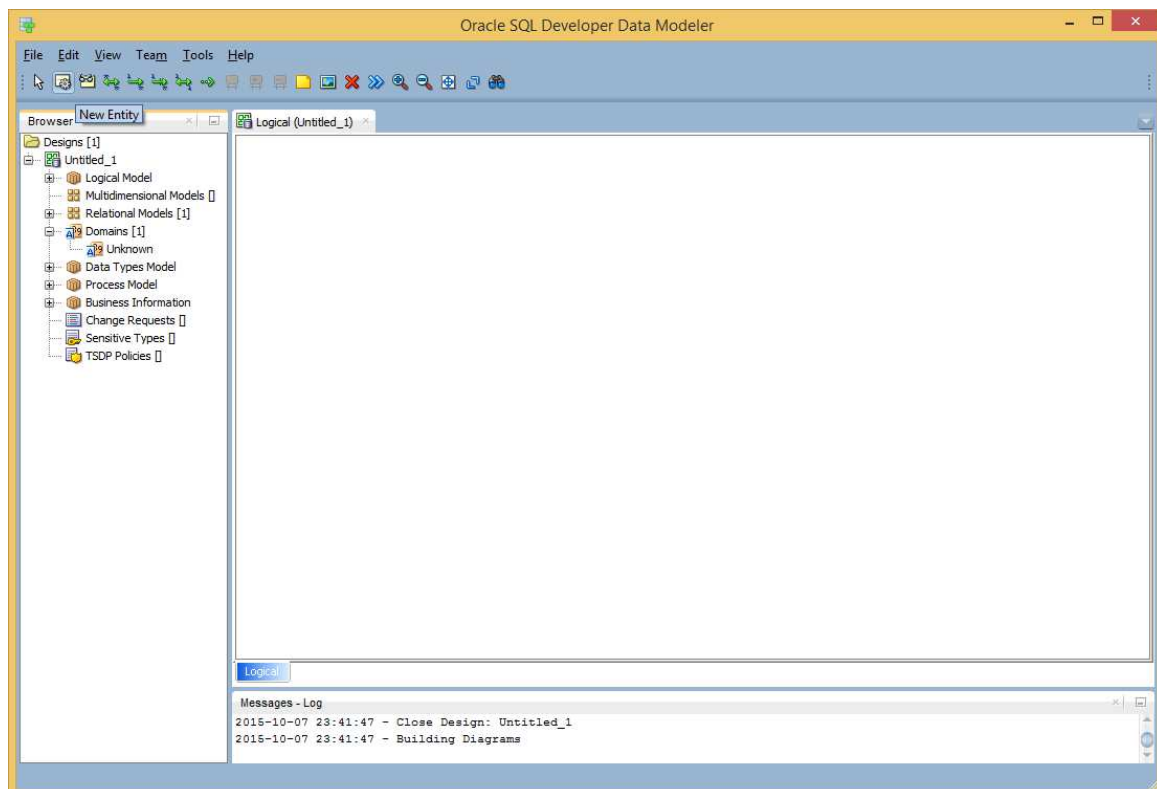
<https://docs.oracle.com/en/database/oracle/sql-developer-data-modeler/>



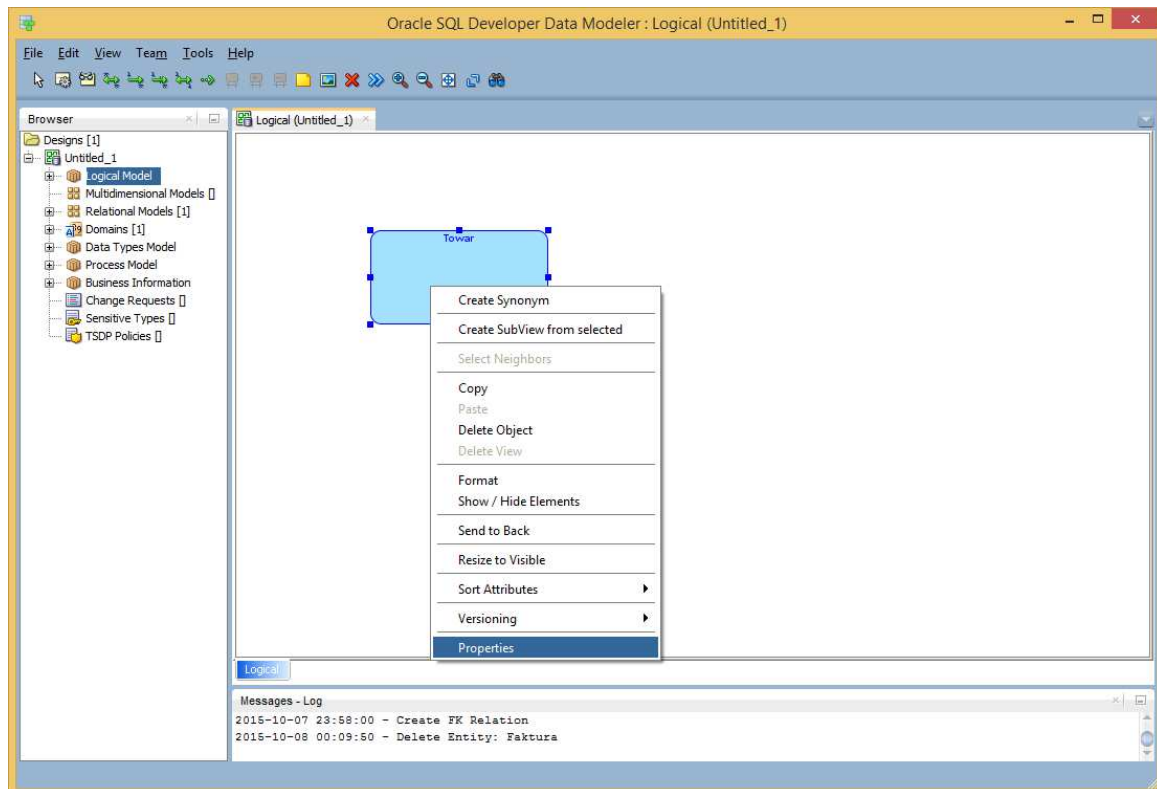
Transition to the logical model:



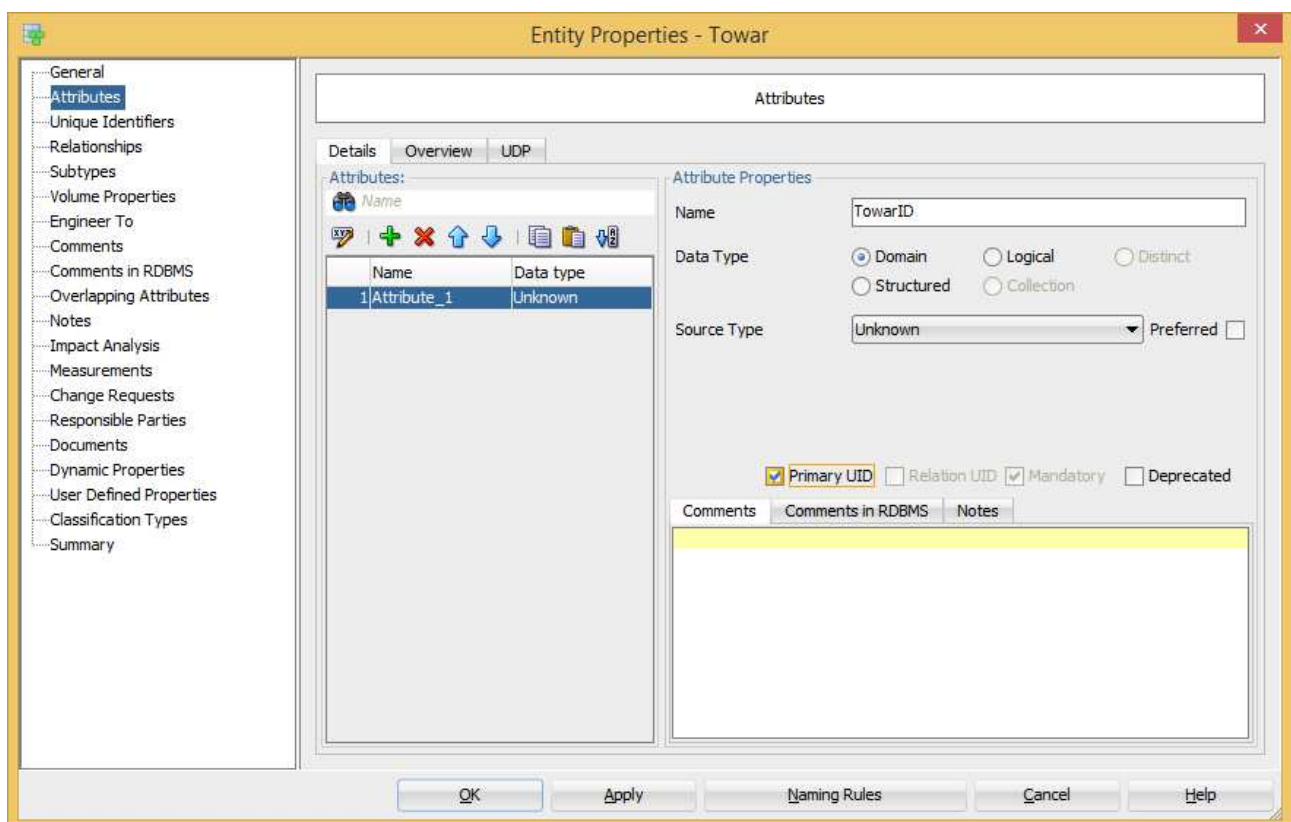
Establishment of a new entity:



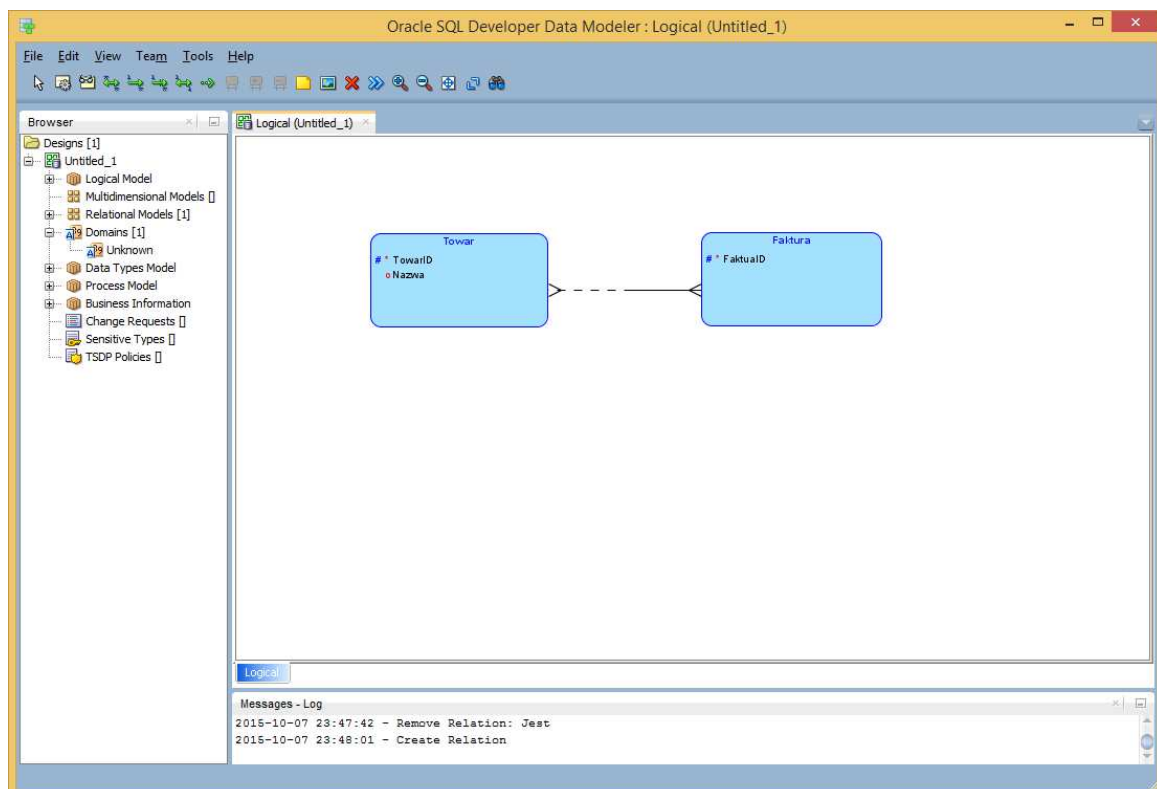
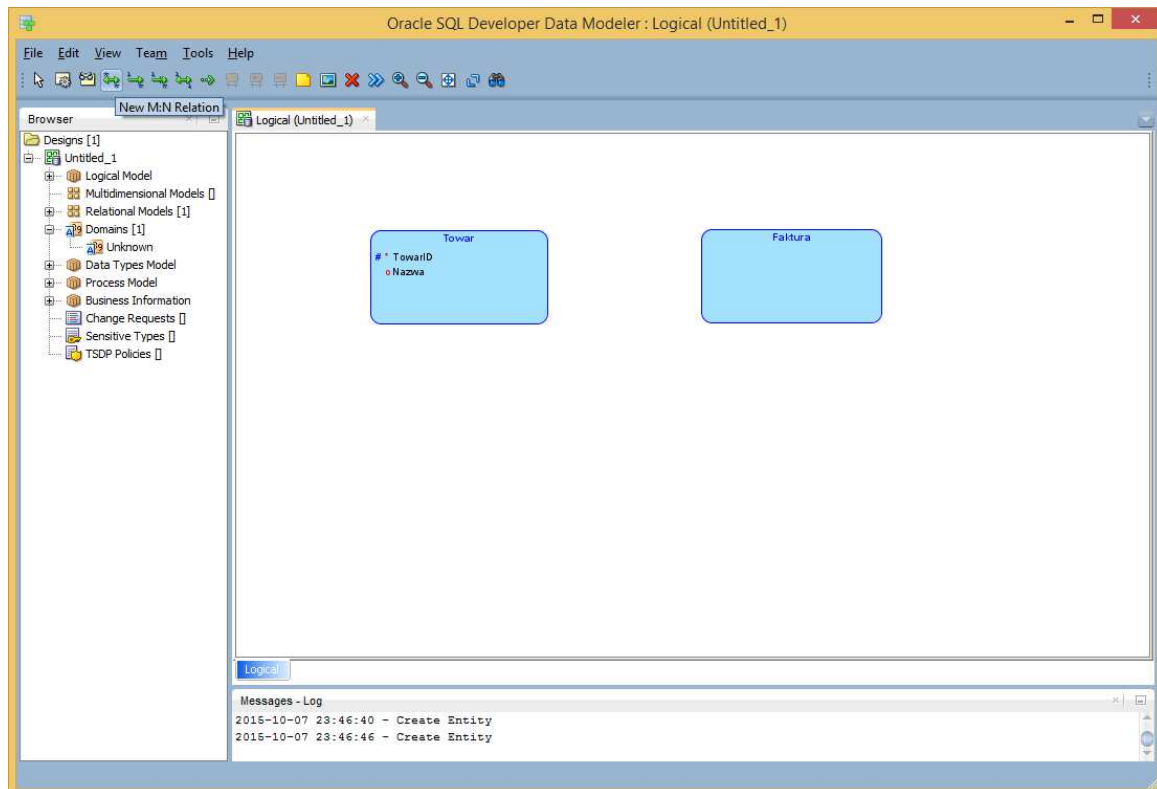
Edit Entity Properties:



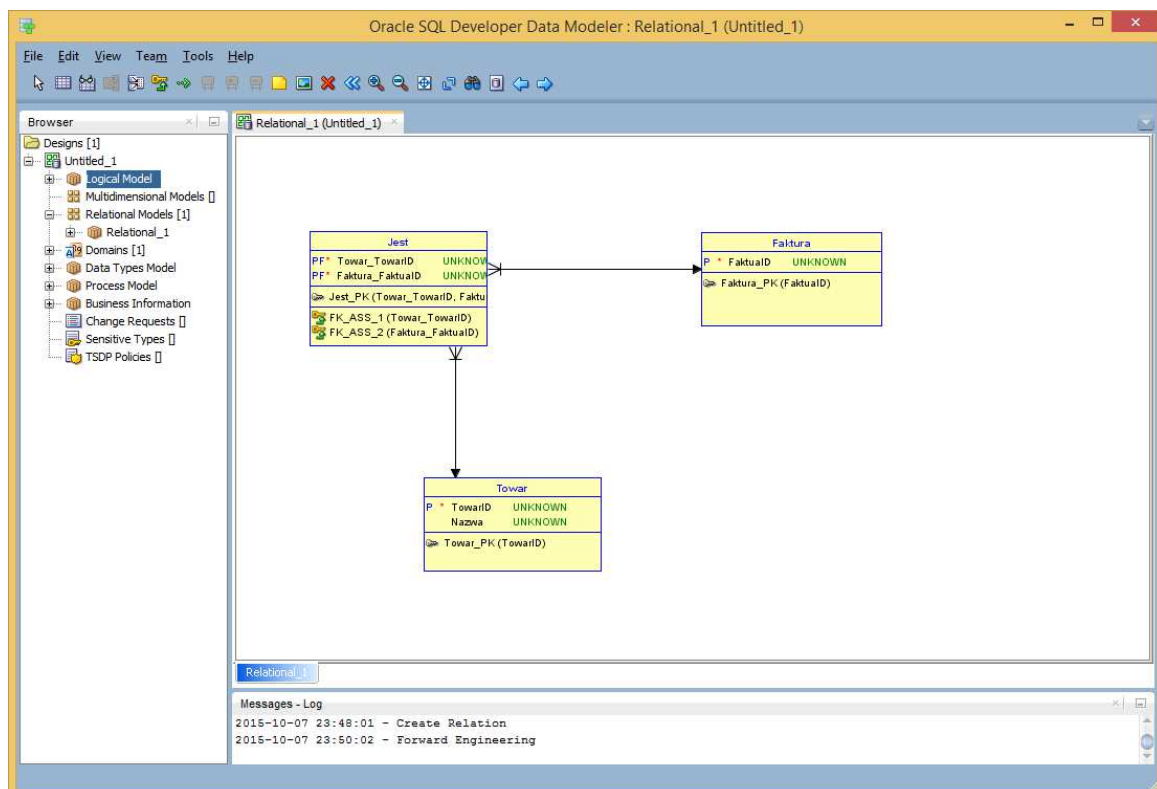
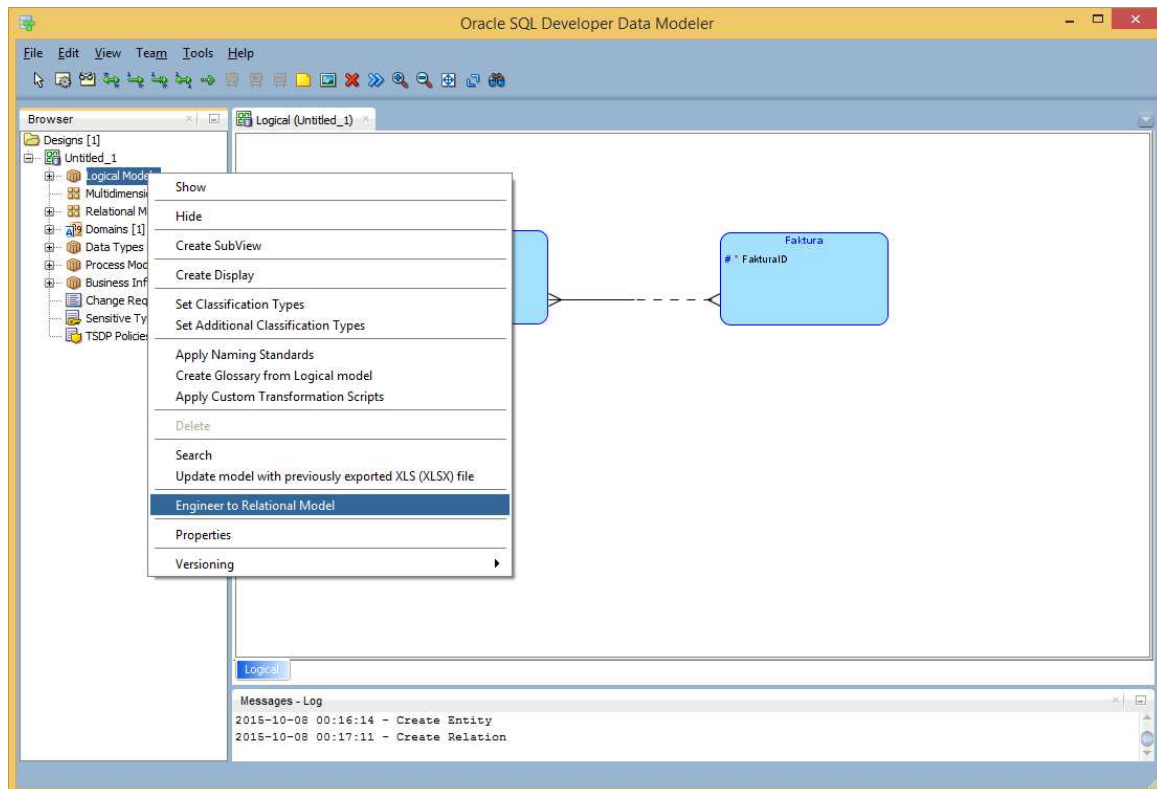
Add an attribute that serves as a unique identifier (a “Primary UID”). Select the data types from the logical types (“Logical”):



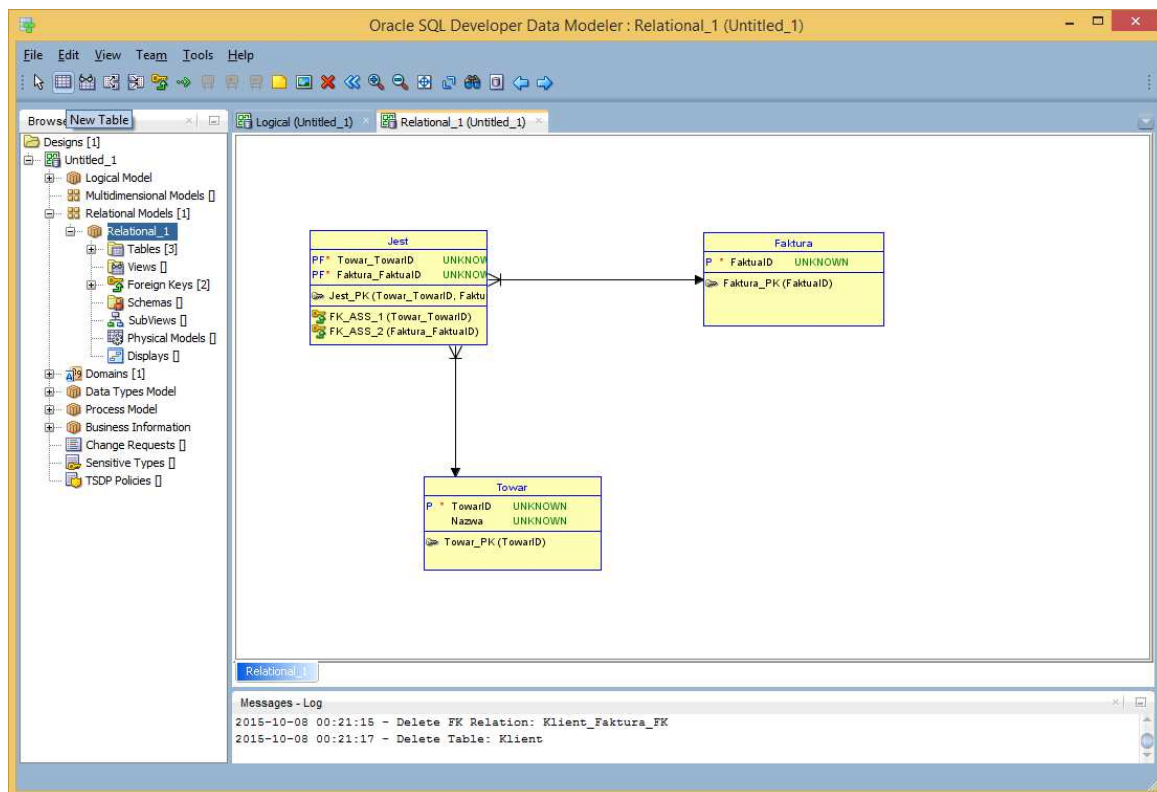
Addition of the relationship 'M:N':



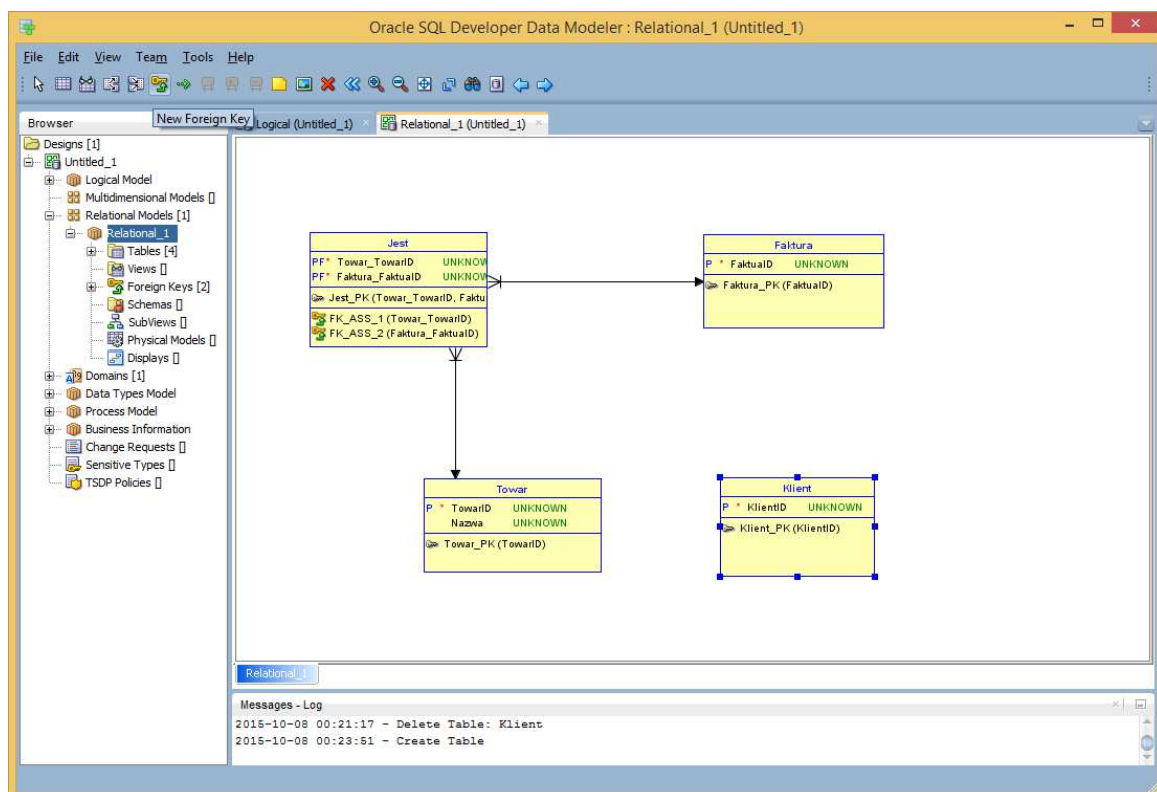
Transforming the logic model to relational:



Create a new table:



Adding a new foreign key:



Foreign Key Properties - Faktura_Klient_FK

General

Name: Faktura_Klient_FK Table: Faktura

PK / UK Index: Klient.Klient_PK Delete Rule: NO ACTION

Source Table Synonym: Klient Target Table Synonym: Faktura

Mandatory: ☒ Deprecated: ☐

Transferable (Updatable): ☒ Generate in DDL: ☒

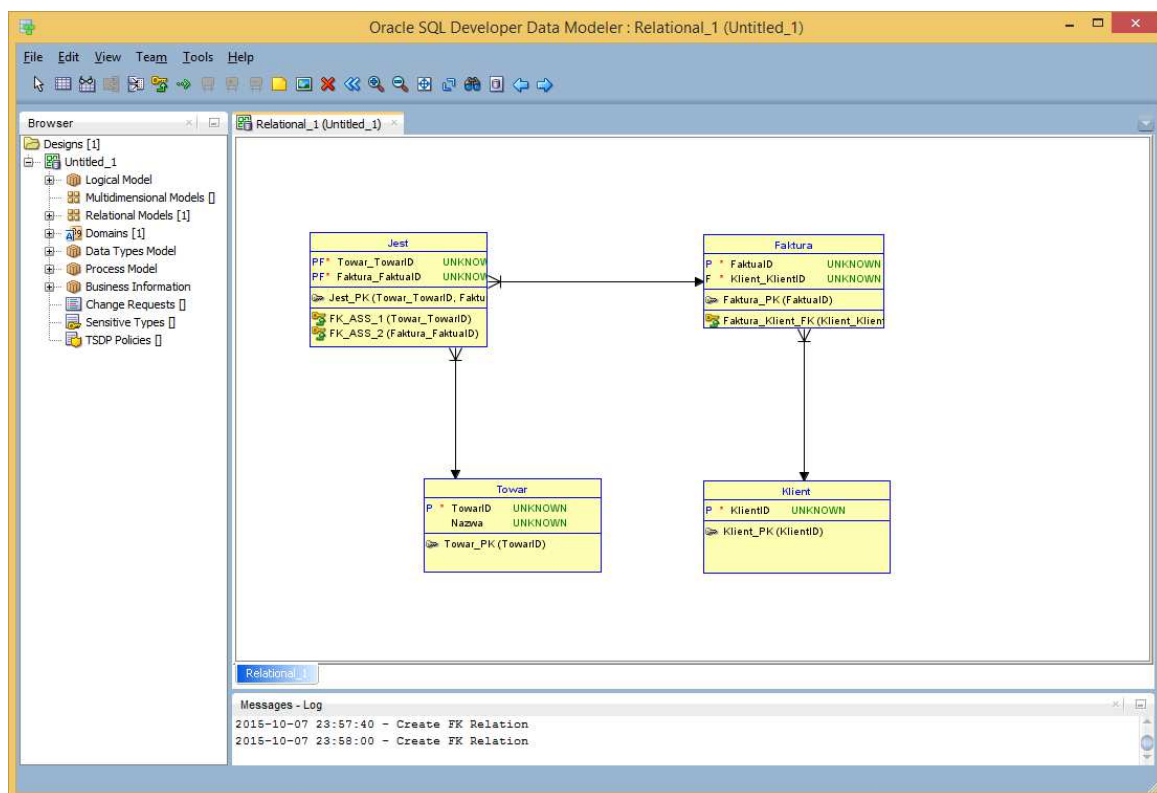
In Arc: ☐ Rely: NO

Discriminator Column: Discriminator Value:

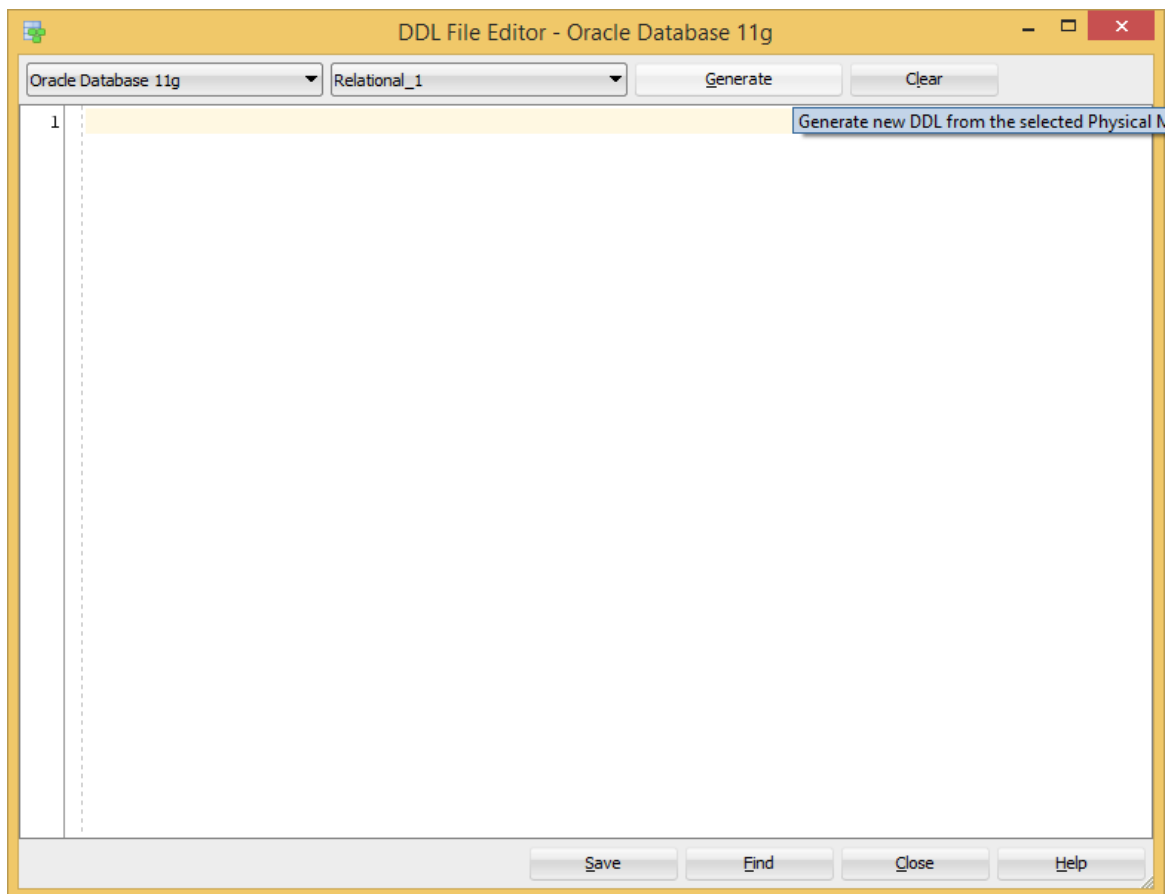
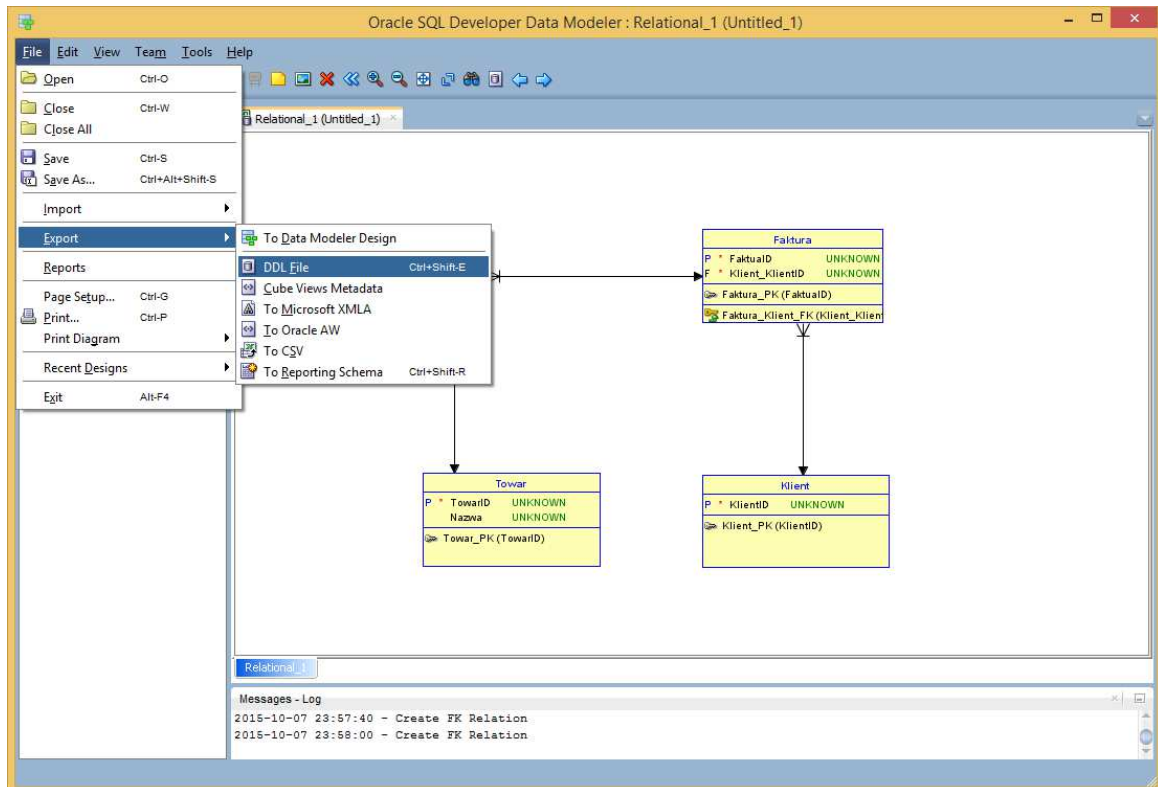
Associated Columns

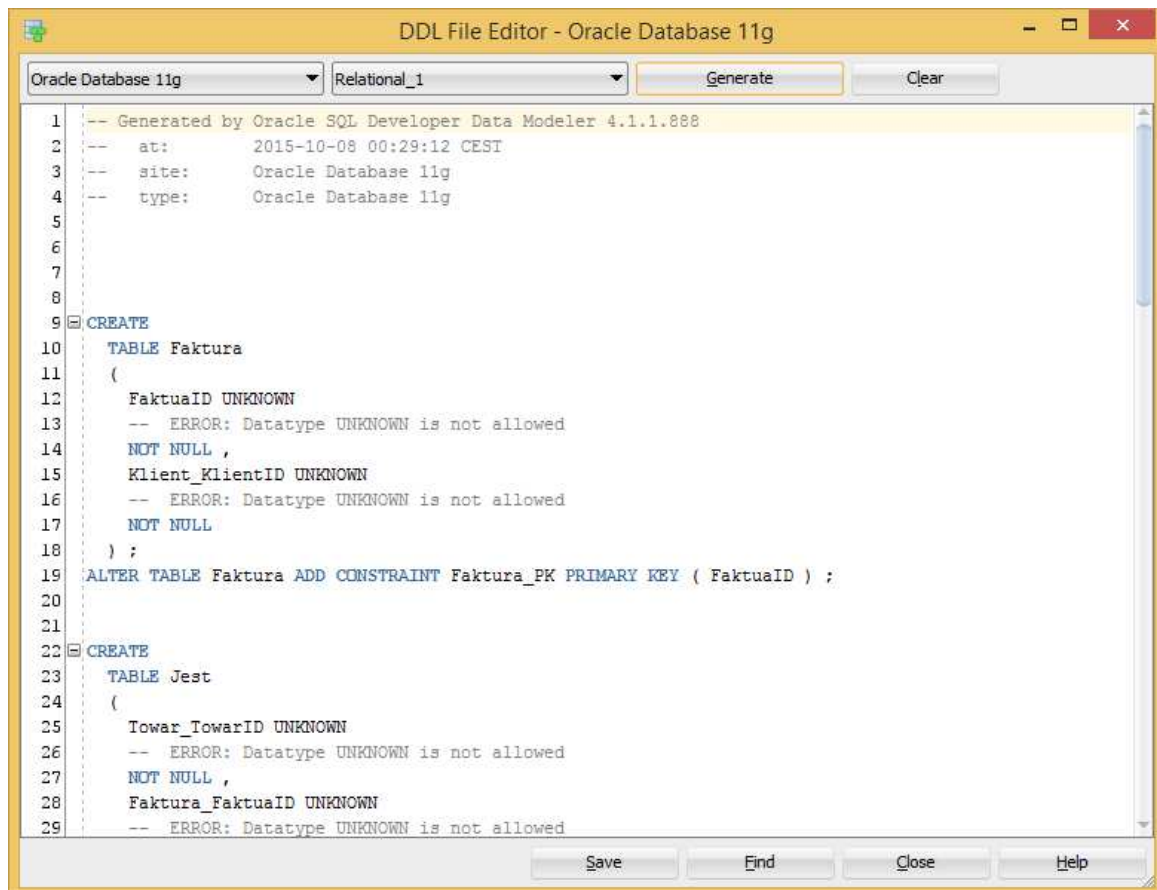
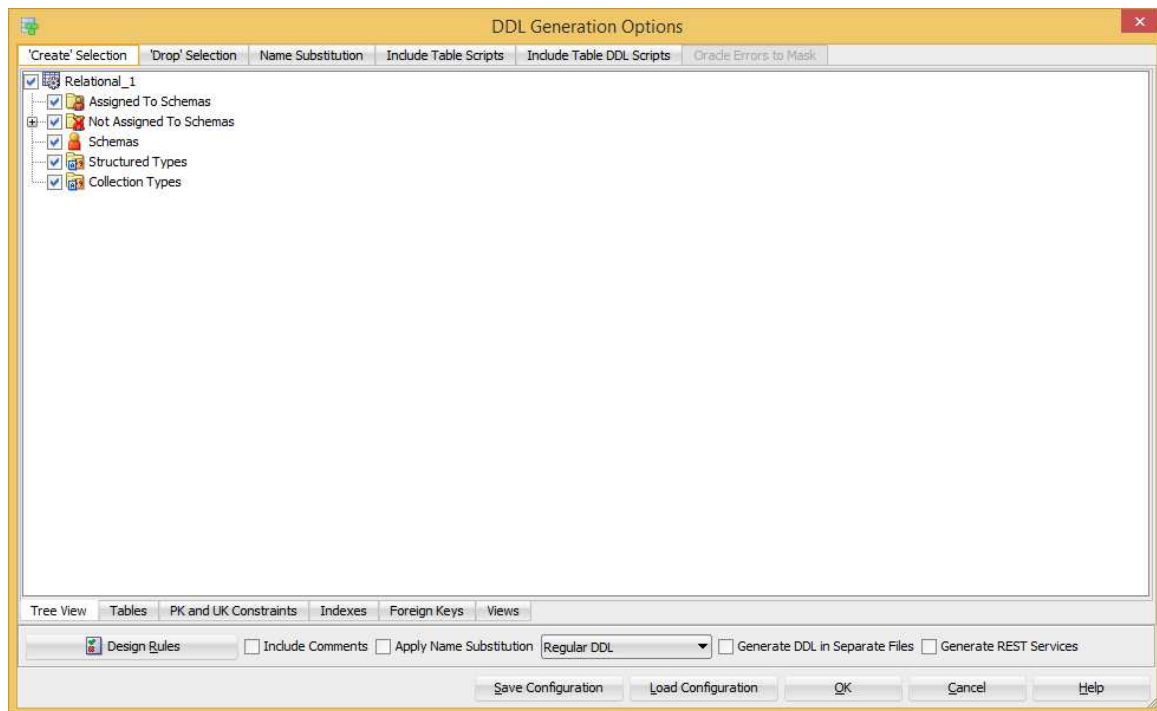
Referenced Column	Column	Mandatory
KlientID	Klient_KlientID	☒

OK Apply Cancel Help



Generate DDL file:



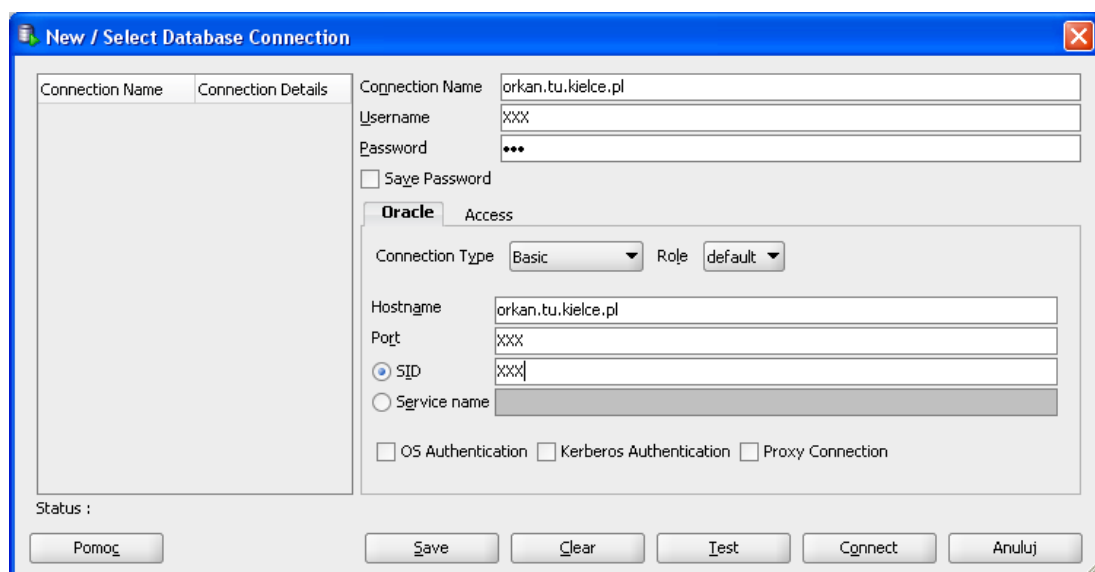
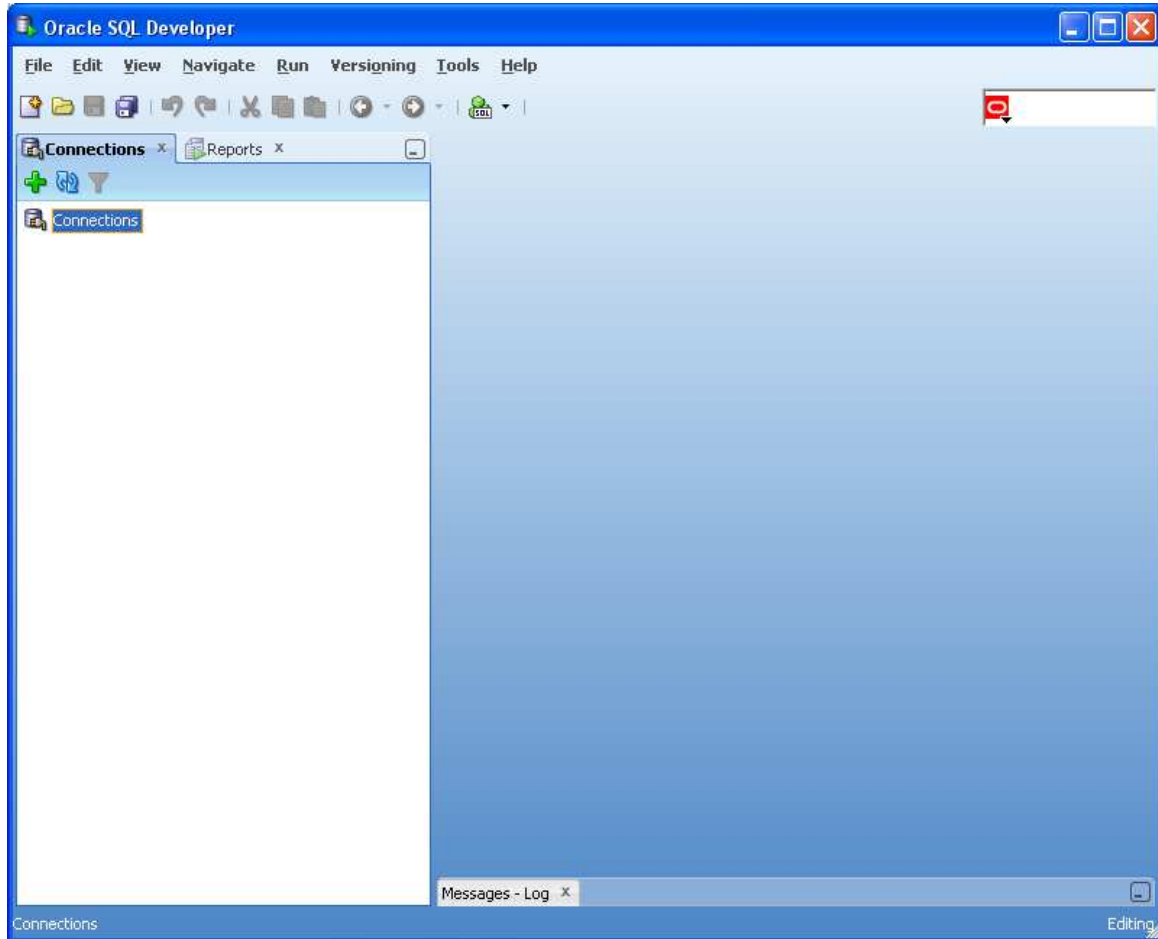


Oracle SQL Developer Program

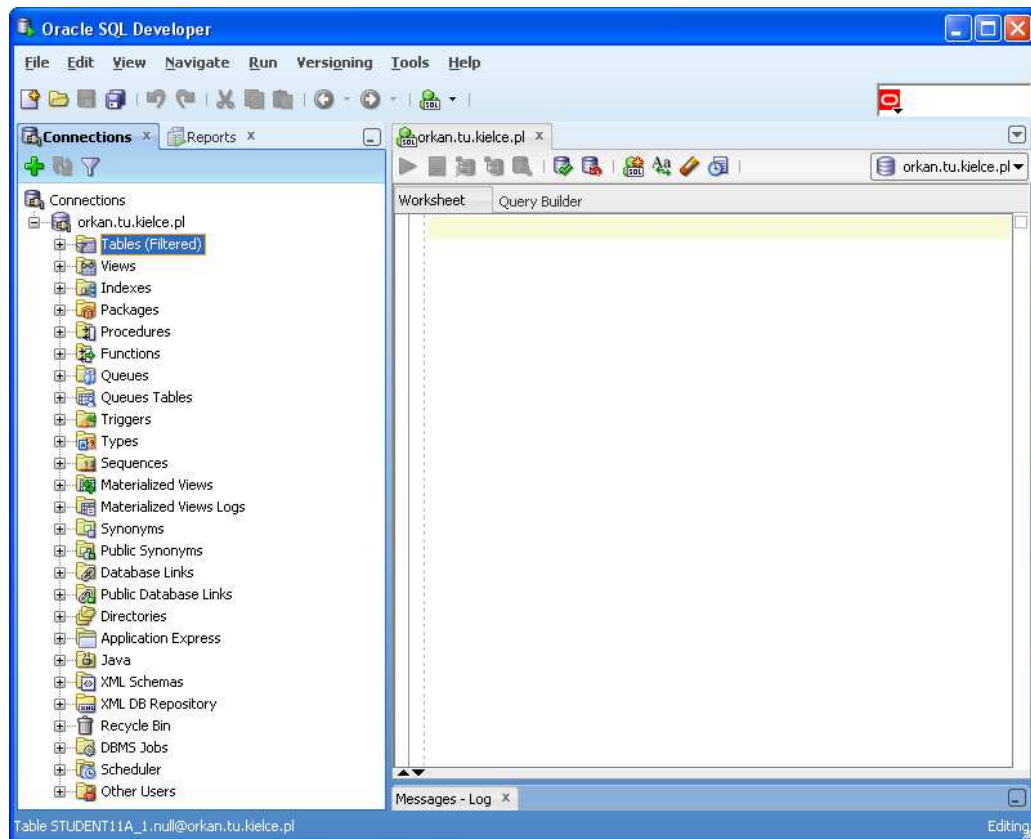
The Oracle SQL Developer homepage can be found at: <https://www.oracle.com/database/technologies/appdev/sql-developer.html>

Documentation for Oracle SQL Developer can be found at: <https://docs.oracle.com/en/database/oracle/sql-developer/>

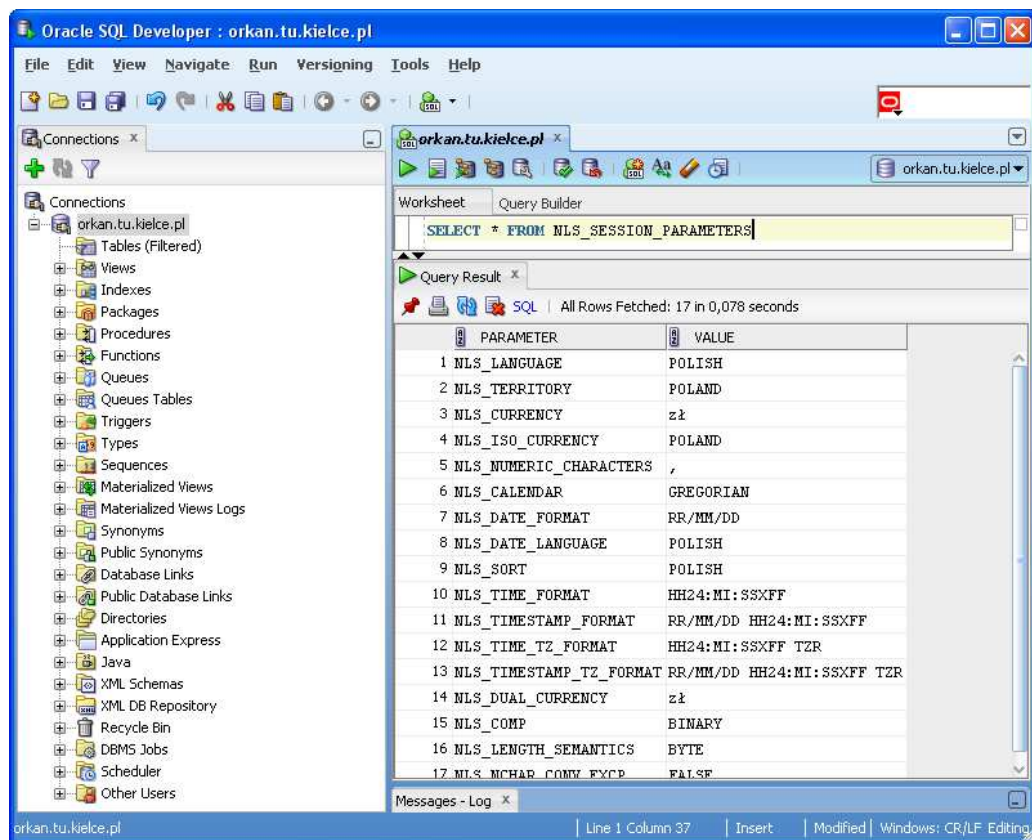
Details of the appearance of the program may vary depending on the version used



View the database schema



Display language settings:



Selected SQL instructions*Plus supported by SQL Developer (square brackets) [] used to mark an optional fragment, i.e. for CONN[ECT] may be used CONNECT or CONN:

Table 1: SQL*Developer commands for the SQL buffer and report formatting

Command	Description
A[PPEND] tekst	Adds text to SQL buffer.
BRE[AK] [ON report _element [action [action]]] ...	It's used to determine changes to the report.
BTI[TLE] [printspec [text variable] ...] [ON OFF]	Sets the footer displayed on each page of the report.
C[HANGE] sepchar old [sepchar [new [sepchar]]]	Change buffer content.
COL[UMN] {column expr} [option ...]	Specifies the display attributes for a column, such as: – Column header text – Alignment of column header – NUMBER data format – Column data wrapping – Change the Boolean default value
COMP[UTE] [function [LAB[EL] text] ... OF {expr column alias} ... ON {expr column alias REPORT ROW} ...]	In conjunction with the BREAK instructions, it lists and prints summary lines.
DEL [n n m n * n LAST * * n * LAST LAST]	Deletes one or more lines from SQL buffer.
GET [FILE] file _name[.ext] [LIST NOLIST]	Uploads file contents to SQL buffer.
I[NPUT] [text]	Adds text to SQL buffer.
L[IST] [n n m n * n LAST * * n * LAST LAST]	Displays SQL buffer contents.
R[UN]	Displays and executes SQL buffer content.
SAV[E] [FILE] file _name[.ext] [CRE[ATE] REP[LACE] APP[END]]	Saves SQL buffer contents in a file.
TTI[TLE] [printspec [text variable] ...] [ON OFF]	Sets the header displayed on each page of the report.

Table 2: Other SQL*Developer commands

Command	Description
@ {url file_name[.ext]} [arg ...] STA[RT] {url file_name[.ext]} [arg ...]	Runs an argument script, e.g. @C:\katalog\skrypt.sql
@@ {url file_name[.ext]} [arg ...]	Runs a nested script with arguments.
/	Execute SQL instructions or PL/SQL block, e.g. SELECT * FROM dual /
ACC[EPT] variable [NUM[BER] CHAR DATE BINARY_FLOAT BINARY_DOUBLE] [FOR[MAT] format] [DEF[AULT] default] [PROMPT text NOPR[OMPT]] [HIDE]	Loads data from the user. ACCEPT haslo CHAR PROMPT 'Haslo: ' HIDE PROMPT HASLO = &password ACCEPT wiek NUMBER FORMAT '999' DEFAULT '18' PROMPT 'Podaj wiek minimalny: ' PROMPT WIEK = &age Listing 1: Loading and displaying password and age (accept.sql)
ATTR[IBUTE] [type_name.attribute_name [option ...]]	Sets the attribute formatting, e.g. ATTRIBUTE DUAL.DUMMY FORMAT A20
CL[EAR] option ...	Reset or delete the current value for a given option.
CONN[ECT] {logon / proxy} [AS {SYSOPER SYSDBA SYSASM}] [edition=value]	Connects the user to the Oracle database.
DEF[INE] [zmienna] [zmienna = wartość]	Sets the value of the substituted variable or displays its value, e.g.: DEFINE zmienna=1 DEFINE zmienna
DESC[RIBE] [{schema}.object[@db_link]]	Prints a table definition, perspective, synonym or function/procedure specification, e.g. DESCRIBE user_tables
DISC[ONNECT]	Disconnects with Oracle's database.
EXEC[UTE] polecenie	Performs PL/SQL expression.
{EXIT QUIT} [SUCCESS FAILURE WARNING n variable :BindVariable] [COMMIT ROLLBACK]	He's closing the program.
HELP [opcja]	Shows help for a given option, e.g. HELP HELP.
HO[ST] komenda	Runs the operating system command, e.g. HOST dir or HOST cd.
OERR [error_code <facility name><error number>]	Shows bug details.
PASSW[ORD] [nazwa_użytkownika]	He's changing his password.
PAU[SE] [tekst]	Displays the given text and waits for the key to be pressed, e.g. PAUSE przerwa techniczna.
PRINT [variable ...]	Displays variable value.

Command	Description
PRO[MPT] [tekst]	Displays the specified text, e.g. PROMPT Wartosc = &variable.
REM[ARK] – comment /* ... */	A single-line or multi-line comment.
SET zmienna_systemowa wartosc	Sets the value of the system variable, modifying the SQL*Plus environment for the current session.
SHO[W] opcja	Displays the value of SQL*Plus system variable or the current environment, e.g.: SHOW ALL SHOW ERR
SHUTDOWN [ABORT IMMEDIATE NORMAL TRANSACTIONAL [LOCAL]]	Closes the Oracle database instance.
SPO[OL] [nazwa_pliku].ext [CRE[ATE] REP[LACE] APP[END]] OFF OUT	Saves query results to a file, e.g.: SPOOL C:\katalog\plik.txt SELECT * FROM dual; SPOOL OFF Note: you must disable saving the results to the file before copying or printing it.
STARTUP db_options cdb_options upgrade_options	Runs the Oracle database instance.
TIMI[NG] [START text SHOW STOP]	Registers time data, displays the name of the current timer and time data or the number of active timers.
UNDEF[INE] zmienna	Deletes the definition of the substituted variable.
VAR[iable] [zmienna [typ]]	Declares a related variable that can be used in PL/SQL or displays its description.
WHENEVER OSERROR	It executes a specific action if there is an error in the operating system.
WHENEVER SQLERROR	Performs a specific action if SQL command or PL/SQL block generates an error.
XQUERY	Allows the XQuery query to be executed.

Tasks - SQL Data Modeler

With SQL Data Modeler:

1. Create a logical model containing the entities: Student, Teacher and Lecture.
2. Link the entities with a union.
3. Transform a logical model into a relational model.
4. Add the table of Sal.
5. Add in the table Lecture the foreign key to the table of the Hall.
6. Generate the DDL file.

Tasks - SQL Developer

1. Run SQL*Developer.
2. The results of all actions should be saved to the log.txt file in the given directory.
3. Display language settings:
`SELECT * FROM NLS_SESSION_PARAMETERS;`
4. In the current directory create a script with a sql extension, e.g. TEST.SQL with content:
`SELECT * FROM ALL_USERS;`
5. Run the above script.
6. Display the definition for ALL_USERS.
7. Edit the script by adding to it the calling programs of the operating system: displaying the path to the current directory (CD for Windows) and cleaning the screen (CLS for Windows).
8. Add comments to the script.
9. Display assistance for CONNECT and SPOOL instructions.
10. Load from user and display: name and year of birth.
11. Disable saving results in the file.
12. End the program.
13. Check the content of log.txt.

Rules for the donation of laboratories

- The labs are sent to the Moodle platform by the end of the day of the classes during which they were performed.
- In case of problems with Moodle, the tasks should be sent to b.bugara@tu.kielce.pl, giving the reason. The subject of the email should contain the subject name, laboratory group number, laboratory instruction number and student name (e.g. DB1_2ID13B_Lab1_Smith)
- The laboratory shall be collected in the form of a report in the format of: **txt**, **pdf**, **docx** or **zip** The report shall contain:
 - DDL file,
 - the content of the log.txt file,
 - screenshots showing the execution of tasks (preferably document them step by step).
- The file name should include the subject name, laboratory group number, laboratory instruction number and student name (e.g. DB1_2ID13B_Lab1_Smith)

References

- [1] Jeffrey D. Ullman, Jennifer Widom, *Basic lecture on database systems*, WNT, 2001.
- [2] Jeffrey D. Ullman, Jennifer Widom, *Database systems, Full lecture*, WNT, 2006.
- [3] Thomas Connolly, Carolyn Begg, *Database systems*, RM Publishing, 2004.
- [4] Thomas Connolly, Carolyn Begg, *Database systems*, Pearson, 2015.
- [5] Kevin Loney, Bob Bryla, *Oracle Database 10g, Database Administrator Handbook*, Helion, 2008.
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- [9] Sharon Allen, *Data modeling*, Helion, 2006.
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- [11] Documentation for Oracle database available at: <https://www.oracle.com>.
- [12] P. J. Sadalage, M. Fowler, *NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence*, Addison-Wesley Professional, 2012.
- [13] Michael Stonebraker, *New SQL: An Alternative to NoSQL and Old SQL For New OLTP Apps* June 16, 2011.
- [14] Oracle Database PL/SQL Language Reference 11g Release 1 (11.1), B28370-02 (B28370.pdf).