

Title: ITMD526_Assignment_05

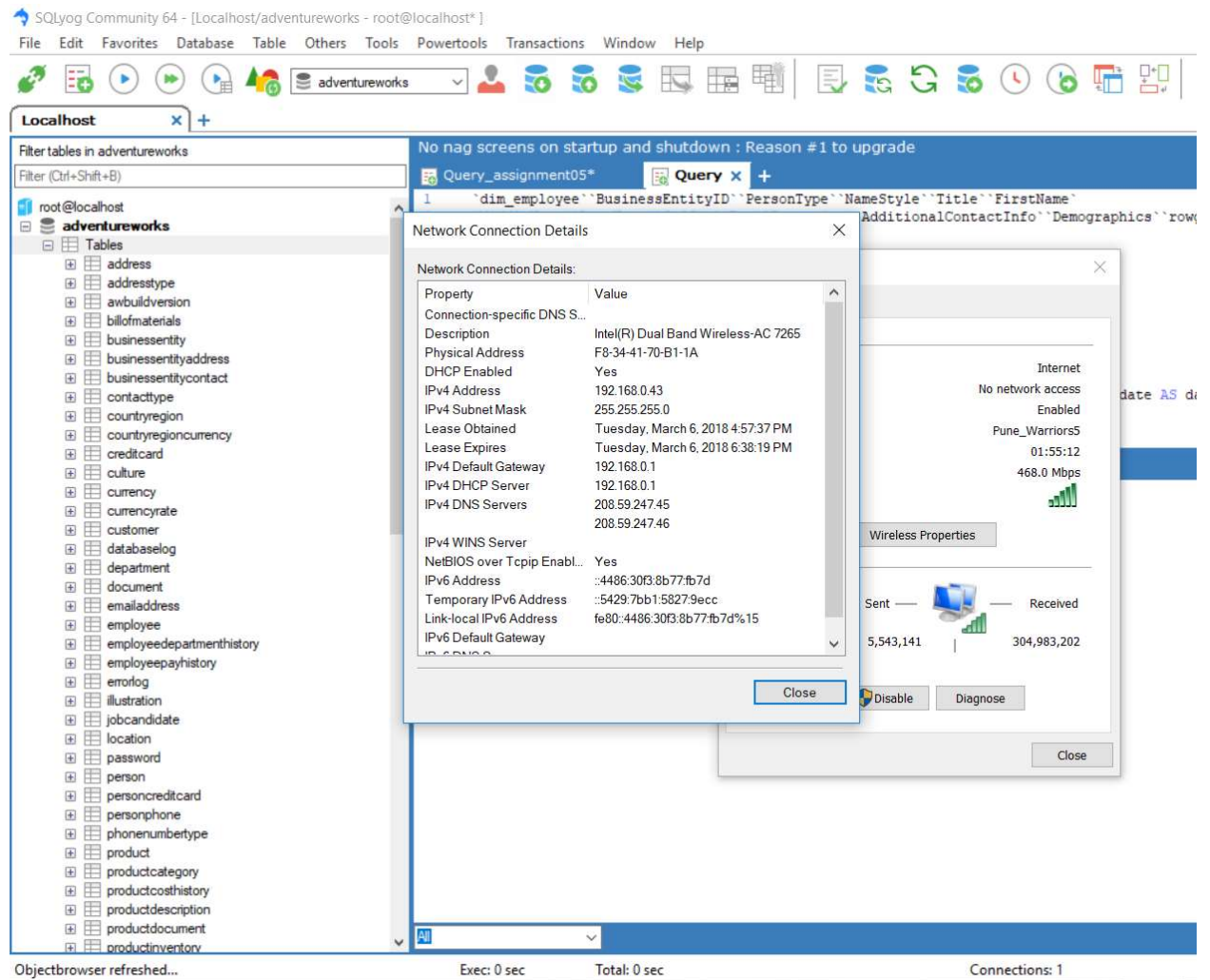
First Name	Last Name	CWID
Arpit	Khandekar	A20409171

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1. Normalization part of Kettle implementation.

1. The goal is to learn how normalization works with the help of ETL transformation.
2. Before running the transformation, we need to import adventureworks database in our local MYSQL database, we are able to see the database name 'adventureworks' in our database.



3. Job has run successfully.

Main job

START → prepare tables → extract → transform → load → Success

Network Connection Details

Property	Value
Connection-specific DNS S...	
Description	Intel(R) Dual Band Wireless-AC 7265
Physical Address	F8-34-41-70-B1-1A
DHCP Enabled	Yes
IPv4 Address	192.168.0.43
IPv4 Subnet Mask	255.255.255.0
Lease Obtained	Tuesday, March 6, 2018 6:03:03 PM
Lease Expires	Tuesday, March 6, 2018 7:03:03 PM
IPv4 Default Gateway	192.168.0.1
IPv4 DHCP Server	192.168.0.1
IPv4 DNS Servers	208.59.247.45
	208.59.247.46
IPv4 WINS Server	
NetBIOS over Tcpip Enabl...	Yes
IPv6 Address	::4486:30f3:8b77:fb7d
Temporary IPv6 Address	::5429:7bb1:5827:9ecc
Link-local IPv6 Address	fe80::4486:30f3:8b77:fb7d%15
IPv6 Default Gateway	

Execution Results

Logging History Job metrics Metrics

2018/03/06 18:15:05 - load-master - Finished job entry [Success] (result=)

2018/03/06 18:15:05 - load-master - Finished job entry [load facts] (result=)

2018/03/06 18:15:05 - load-master - Finished job entry [load dimension] (result=)

2018/03/06 18:15:05 - main-job - Starting entry [Success] (result=)

2018/03/06 18:15:05 - main-job - Finished job entry [Success] (result=)

2018/03/06 18:15:05 - main-job - Finished job entry [load] (result=[true])

2018/03/06 18:15:05 - main-job - Finished job entry [transform] (result=[true])

2018/03/06 18:15:05 - main-job - Finished job entry [extract] (result=[true])

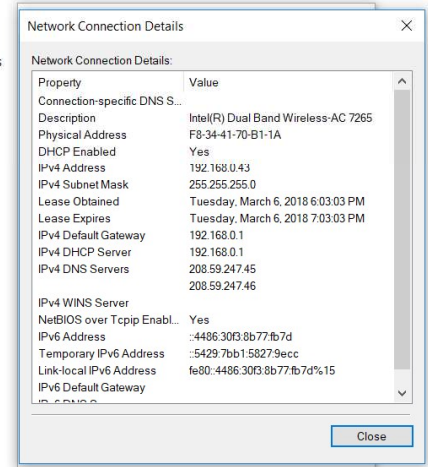
2018/03/06 18:15:05 - main-job - Finished job entry [prepare tables] (result=[true])

2018/03/06 18:15:05 - main-job - Job execution finished

2018/03/06 18:15:05 - Spoon - Job has ended.

2. Extraction of four data tables(person, employee, employeedepartmenthistory and department) for creation of dim_employee.

1. Now, Create a new main job which will contain script file 'prepare tables', and two jobs 'Extract' and 'Job'.



2. In SQL script we need to create a new Database source_db and salesmart_db, also we need to write SQL to create a database tables in both database.

SQL Script contains following:

- Setting foreign_key_checks = zero;
- Creating two databases source_db and salesmart_db
- Creating tables employee, person, employeedepartmenthistory and department into source_db database.
- Creating dim_employee into database salesmart_db database.
- Setting Foreign key checks = 1 at the end.

Execute SQL Script...

Job entry name: prepare tables

Connection: localhost-sandbox

SQL from file: ☐

SQL filename:

Send SQL as single statement? ☐

Use variable substitution? ☐

SQL Script:

```
/* Disable foreign key constraints */
SET FOREIGN_KEY_CHECKS=0;

/* source_db */
CREATE DATABASE IF NOT EXISTS source_db DEFAULT CHARACTER SET = utf8;
CREATE DATABASE IF NOT EXISTS salesart_db DEFAULT CHARACTER SET = utf8;

DROP TABLE IF EXISTS source_db.employee;
CREATE TABLE source_db.employee (
    BusinessEntityID INT(11) NOT NULL COMMENT 'Primary key for Employee records. Foreign key to BusinessEntity.BusinessEntityID.',
    NationalIDNumber VARCHAR(15) NOT NULL COMMENT 'Unique national identification number such as a social security number.',
    LoginID VARCHAR(255) NOT NULL COMMENT 'Network login.',
    OrganizationNode VARCHAR(255) DEFAULT NULL COMMENT 'Where the employee is located in corporate hierarchy.',
    OrganizationLevel SMALLINT(6) DEFAULT NULL COMMENT 'The depth of the employee in the corporate hierarchy.',
    JobTitle VARCHAR(50) NOT NULL COMMENT 'Work title such as Buyer or Sales Representative.',
    BirthDate DATE NOT NULL COMMENT 'Date of birth.',
    MaritalStatus CHAR(1) NOT NULL COMMENT 'M = Married, S = Single',
    Gender CHAR(1) NOT NULL COMMENT 'M = Male, F = Female',
    HireDate DATE NOT NULL COMMENT 'Employee hired on this date.',
    SalariedFlag TINYINT(1) NOT NULL DEFAULT '1' COMMENT 'Job classification. 0 = Hourly, not exempt from collective bargaining. 1 = Salaried, exempt from collective bargaining.',
    VacationHours SMALLINT(6) NOT NULL DEFAULT '0' COMMENT 'Number of available vacation hours.',
    SickLeaveHours SMALLINT(6) NOT NULL DEFAULT '0' COMMENT 'Number of available sick leave hours.',
    CurrentFlag TINYINT(1) NOT NULL DEFAULT '1' COMMENT '0 = Inactive, 1 = Active',
    rowguid VARCHAR(64) NOT NULL COMMENT 'ROWGUIDCOL number uniquely identifying the record. Used to support a merge replication sample.',
    ModifiedDate TIMESTAMP NOT NULL DEFAULT CURRENT_TIMESTAMP COMMENT 'Date and time the record was last updated.',
    PRIMARY KEY (BusinessEntityID),
    UNIQUE KEY 'rowguid' (rowguid),
    UNIQUE KEY 'AK_Employee_NationalIDNumber' (NationalIDNumber),
    UNIQUE KEY 'AK_Employee_rowguid' (rowguid),
    UNIQUE KEY 'AK_Employee_LoginID' (LoginID (255))
) ENGINE=InnoDB DEFAULT CHARSET=latin1 COMMENT='Employee information such as salary, department, and title.';

DROP TABLE IF EXISTS source_db.person;
CREATE TABLE source_db.person (
    BusinessEntityID INT(11) NOT NULL COMMENT 'Primary key for Person records.',
    PersonType CHAR(2) NOT NULL COMMENT 'Primary type of person. SC = Store Contact, IN = Individual (retail) customer, SP = Sales person, EM = Employee (non-sales), VC = Vendor contact.',
    NameStyle TINYINT(1) NOT NULL DEFAULT '0' COMMENT '0 = The data in FirstName and LastName are stored in western style (first name, last name) order. 1 = Eastern style (last name, first name) order.',
    Title VARCHAR(8) DEFAULT NULL COMMENT 'A courtesy title. For example, Mr. or Ms.',
    FirstName VARCHAR(100) NOT NULL COMMENT 'First name of the person.',
    MiddleName VARCHAR(100) DEFAULT NULL COMMENT 'Middle name or middle initial of the person.',
    LastName VARCHAR(100) NOT NULL COMMENT 'Last name of the person.',
    Suffix VARCHAR(10) DEFAULT NULL COMMENT 'Surname suffix. For example, Sr. or Jr.',
    EmailPromotion INT(11) NOT NULL DEFAULT '0' COMMENT '0 = Contact does not wish to receive e-mail promotions, 1 = Contact does wish to receive e-mail promotions from AdventureWorks.',
    AdditionalContactInfo TEXT COMMENT 'Additional contact information about the person stored in xml format.',
    Demographics TEXT COMMENT 'Personal information such as hobbies, and income collected from online shoppers. Used for sales analysis.',
    rowguid VARCHAR(64) NOT NULL COMMENT 'ROWGUIDCOL number uniquely identifying the record. Used to support a merge replication sample.',
    ModifiedDate TIMESTAMP NOT NULL DEFAULT CURRENT_TIMESTAMP COMMENT 'Date and time the record was last updated.',
    PRIMARY KEY (BusinessEntityID),
    UNIQUE KEY 'rowguid' (rowguid),
    UNIQUE KEY 'AK_Person_rowguid' (rowguid)
) ENGINE=InnoDB DEFAULT CHARSET=latin1 COMMENT='Human beings involved with AdventureWorks: employees, customer contacts, and vendor contacts.';


```

Line 1 Column 0

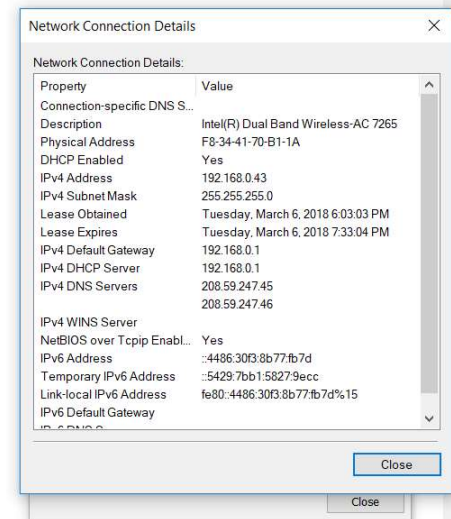
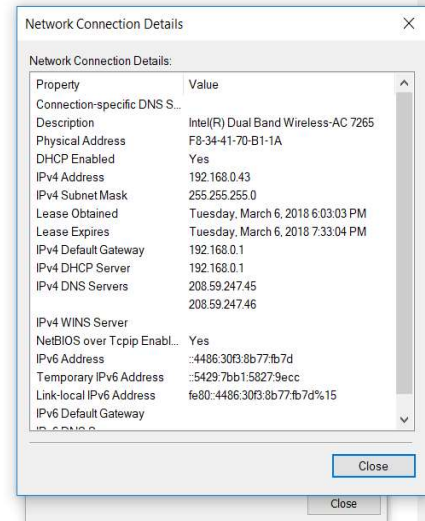
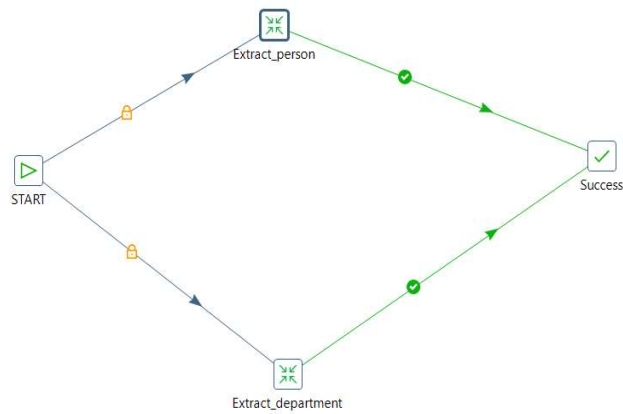
Help OK Cancel

Network Connection Details

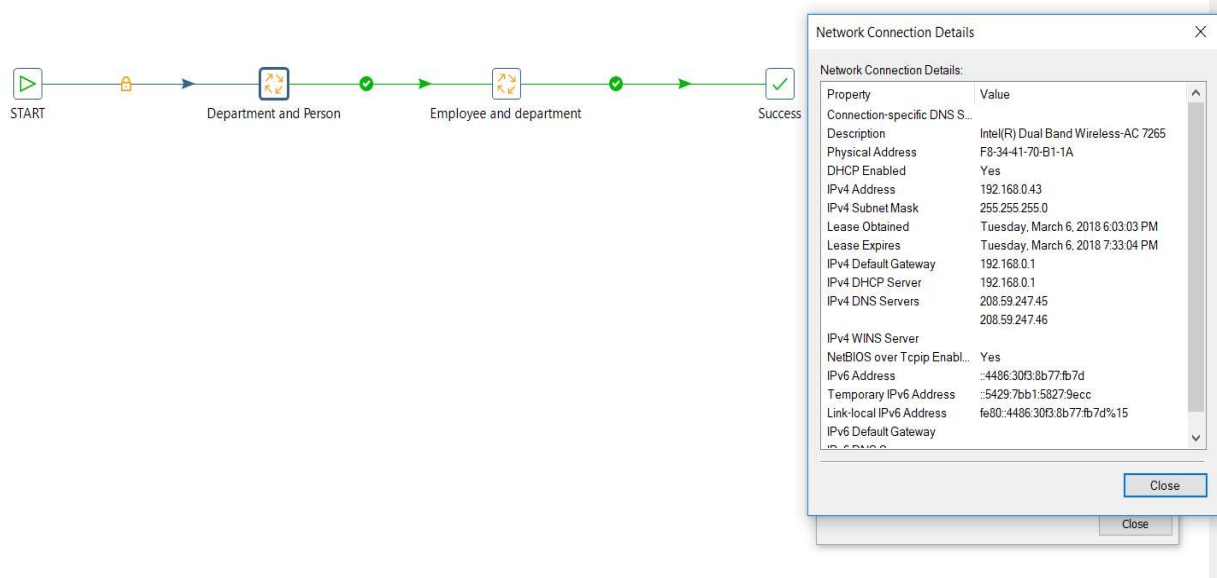
Property	Value
Connection-specific DNS S...	
Description	Intel(R) Dual Band Wireless-AC 7265
Physical Address	F8-34-41-70-B1-1A
DHCP Enabled	Yes
IPv4 Address	192.168.0.43
IPv4 Subnet Mask	255.255.255.0
Lease Obtained	Tuesday, March 6, 2018 6:03:03 PM
Lease Expires	Tuesday, March 6, 2018 7:03:03 PM
IPv4 Default Gateway	192.168.0.1
IPv4 DHCP Server	192.168.0.1
IPv4 DNS Servers	208.59.247.45
	208.59.247.46
IPv4 WINS Server	
NetBIOS over Tcpip Enabl...	Yes
IPv6 Address	:4486:3093:8b77:b7d
Temporary IPv6 Address	:5429:76b1:5827:9ecc
Link-local IPv6 Address	fe80::4486:3093:8b77:b7d%15
IPv6 Default Gateway	

Close

- Now we will link another job to 'Extract job' of main where we will create two Jobs 'Department and Person and Employee and Department' which will contain another job which is required transformations, In those transformation we will table input connected to localhost-adventureworks database and connecting it to table output having connection localhost-source_db.



4. Now merge those two jobs to one job `extract_jobinfomain` and run those jobs.



3. To load database in dim_employee table into salesmart_db database

1. Now, we will connect a job with main job which contains two SQL script, Transformation.
2. Here, at first script we will set foreign key check = 0 afterwards we will set foreign key check =0 and in other script we will set foreign key check =1.
3. In this transformation we will select Table input and Table output where we will use three database lookup to join table person, department, employee and employeedepartmenthistory by specifying the values in lookup table for every table.

Table input

Step name

Table input

Connection

localhost_sourcedb

Edit... New... Wizard...

Get SQL select statement...

SQL

```

SELECT
  BusinessEntityID
  NationalIDNumber
  LoginID
  OrganizationNode
  OrganizationLevel
  JobTitle
  BirthDate
  MaritalStatus
  Gender
  HireDate
  SalariedFlag
  VacationHours
  SickLeaveHours
  CurrentFlag
  rowguid
  ModifiedDate
FROM employee

```

Line 1 Column 0

Enable lazy conversion

☐

Replace variables in script?

☐

Insert data from step

☐

Execute for each row?

☐

Limit size

0

Help

OK

Preview

Cancel

Network Connection Details

Property

Value

Connection-specific DNS S...

Intel(R) Dual Band Wireless-AC 7265

Description

F8-34-41-70-B1-1A

Physical Address

Yes

DHCP Enabled

192.168.0.43

IPv4 Address

255.255.255.0

IPv4 Subnet Mask

Tuesday, March 6, 2018 6:03:03 PM

Lease Obtained

Tuesday, March 6, 2018 7:33:04 PM

Lease Expires

192.168.0.1

IPv4 Default Gateway

192.168.0.1

IPv4 DHCP Server

208.59.247.45

IPv4 DNS Servers

208.59.247.46

IPv4 WINS Server

Yes

NetBIOS over Tcpip Enabl...

::4486:30f3:8b77:fb7d

IPv6 Address

::5429:7bb1:5827:9ecc

Temporary IPv6 Address

fe80::4486:30f3:8b77:fb7d%15

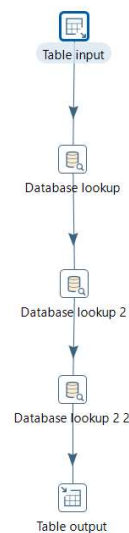
Link-local IPv6 Address

192.168.0.1

IPv6 Default Gateway

208.59.247.46

Close



Network Connection Details

Property

Value

Connection-specific DNS S...

Intel(R) Dual Band Wireless-AC 7265

Description

F8-34-41-70-B1-1A

Physical Address

Yes

DHCP Enabled

192.168.0.43

IPv4 Address

255.255.255.0

IPv4 Subnet Mask

Tuesday, March 6, 2018 6:03:03 PM

Lease Obtained

Tuesday, March 6, 2018 7:33:04 PM

Lease Expires

192.168.0.1

IPv4 Default Gateway

192.168.0.1

IPv4 DHCP Server

208.59.247.45

IPv4 DNS Servers

208.59.247.46

IPv4 WINS Server

Yes

NetBIOS over Tcpip Enabl...

::4486:30f3:8b77:fb7d

IPv6 Address

::5429:7bb1:5827:9ecc

Temporary IPv6 Address

fe80::4486:30f3:8b77:fb7d%15

Link-local IPv6 Address

192.168.0.1

IPv6 Default Gateway

208.59.247.46

Close

Person Databaselookup table:

Database Value Lookup

Step name: Database lookup

Connection: localhost_sourcedb

Lookup schema:

Lookup table: person

Enable cache? ☐

Cache size in rows (0=cache): 0

Load all data from table: ☐

The key(s) to look up the value(s):

#	Table field	Comparator	Field1	Field2
1	BusinessEntityID	=	BusinessEntityID	

Values to return from the lookup table:

#	Field	New name	Default	Type
1	FirstName			String
2	LastName			String

Do not pass the row if the lookup fails: ☐

Fail on multiple results?: ☐

Order by:

Help OK Cancel Get Fields Get lookup fields

Network Connection Details

Property	Value
Connection-specific DNS S...	
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IPv4 WINS Server	
NetBIOS over Tcpip Enabl...	Yes
IPv6 Address	::4486:30f3:b777:b7d
Temporary IPv6 Address	::5429:7bb1:5827:9ecc
Link-local IPv6 Address	fe80::4486:30f3:b777:b7d%15
IPv6 Default Gateway	

Close

Employee department history table:

Database Value Lookup

Step name: Database lookup 2

Connection: localhost_sourcedb

Lookup schema:

Lookup table: employee department history

Enable cache? ☐

Cache size in rows (0=cache): 0

Load all data from table: ☐

The key(s) to look up the value(s):

#	Table field	Comparator	Field1	Field2
1	BusinessEntityID	=	BusinessEntityID	

Values to return from the lookup table:

#	Field	New name	Default	Type
1	StartDate			Date
2	EndDate			Date
3	DepartmentID			Integer

Do not pass the row if the lookup fails: ☐

Fail on multiple results?: ☐

Order by:

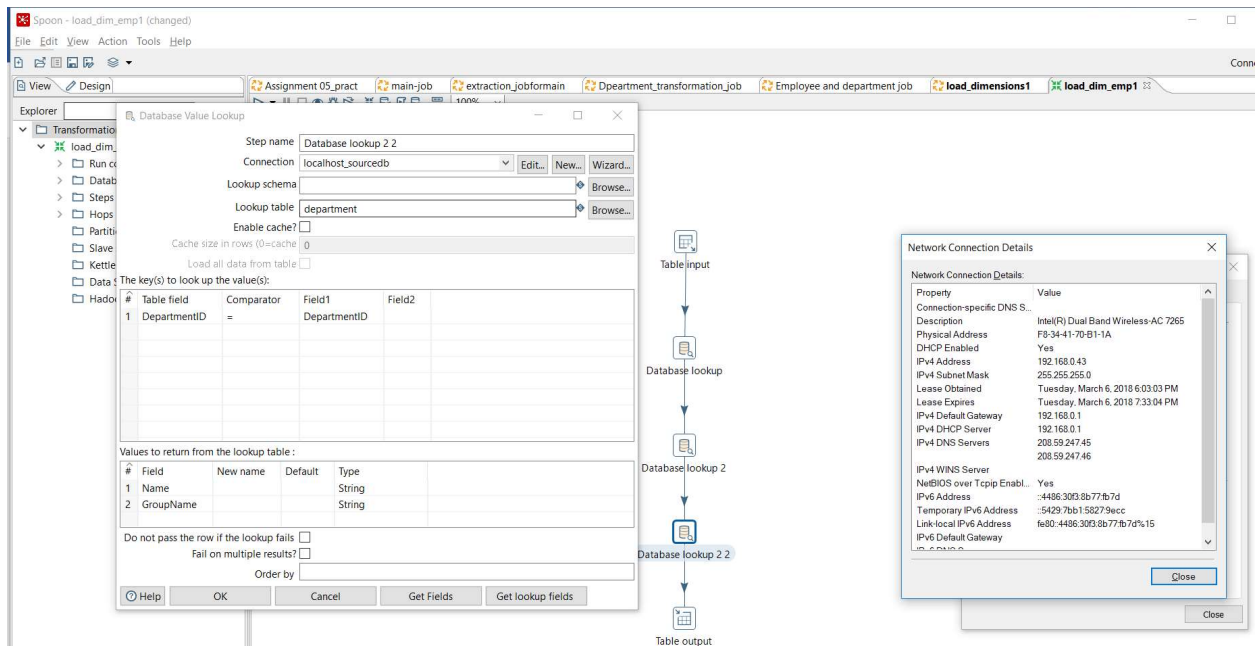
Help OK Cancel Get Fields Get lookup fields

Network Connection Details

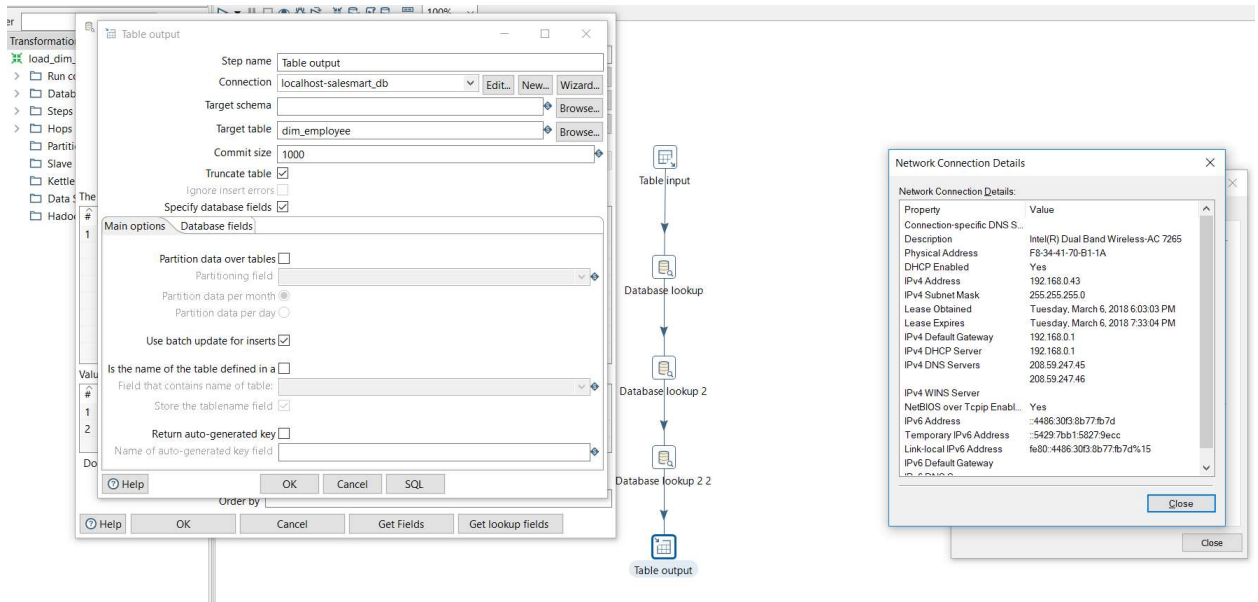
Property	Value
Connection-specific DNS S...	
Description	Intel(R) Dual Band Wireless-AC 7265
Physical Address	F8-34-41-70-B1-1A
DHCP Enabled	Yes
IPv4 Address	192.168.0.43
IPv4 Subnet Mask	255.255.255.0
Lease Obtained	Tuesday, March 6, 2018 6:03:03 PM
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IPv4 DHCP Server	192.168.0.1
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IPv4 WINS Server	
NetBIOS over Tcpip Enabl...	Yes
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Link-local IPv6 Address	fe80::4486:30f3:b777:b7d%15
IPv6 Default Gateway	

Close

Department table:



Tableoutput screenshot:



- At the end, we will the run the main job 'Assignment05_pract.kjb'

Assignment 05_pract main-job load_dimensions1 load_dim_emp1

Assignment 05_Arpit Khandekar

START → prepare tables → Extract → Job → Success

Execution Results

Logging History Job metrics Metrics

```

2018/03/06 20:36:15 - load_dimensions1 - Finished job entry [Success] (result=[true])
2018/03/06 20:36:15 - load_dimensions1 - Finished job entry [SQL_enable_foreign_key] (result=[true])
2018/03/06 20:36:15 - load_dimensions1 - Finished job entry [Transformation] (result=[true])
2018/03/06 20:36:15 - load_dimensions1 - Finished job entry [SQL_disable_foreign_key] (result=[true])
2018/03/06 20:36:15 - Assignment 05_pract - Starting entry [Success]
2018/03/06 20:36:15 - Assignment 05_pract - Finished job entry [Success] (result=[true])
2018/03/06 20:36:15 - Assignment 05_pract - Finished job entry [Job] (result=[true])
2018/03/06 20:36:15 - Assignment 05_pract - Finished job entry [Extract] (result=[true])
2018/03/06 20:36:15 - Assignment 05_pract - Finished job entry [prepare tables] (result=[true])
2018/03/06 20:36:15 - Assignment 05_pract - Job execution finished
2018/03/06 20:36:15 - Spoon - Job has ended.

```

Wi-Fi Status

Network Connection Details

Property	Value
Connection-specific DNS S...	
Description	Intel(R) Dual Band Wireless-AC 7265
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IPv4 WINS Server	
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Temporary IPv6 Address	::5429:7bb1:5827:9ecc
Link-local IPv6 Address	fe80::4486:3093:8b77:f7d%15
IPv6 Default Gateway	

Close

5. We can check the final output of job from database and data can be compared with the query provided.

SQLyog Community 64 - [localhost/salesmart_db - root@localhost]

File Edit Favorites Database Table Others Tools PowerTools Transactions Window Help

salesmart_db

Automatically synchronize your data using Data Sync Tool : Reason #28 to upgrade

Query_assignment05* Query Query x +

1

Messages 2 Table Data Info

BusinessEntityID	StartDate	EndDate	ModifiedDate	Name	JobTitle
1	2003-02-15 00:00:00	(NULL)	2008-07-31 01:00:00	Executive	Chief Executive Officer
2	2002-03-03 00:00:00	(NULL)	2008-07-31 01:00:00	Engineering	Vice President
3	2001-12-12 00:00:00	(NULL)	2008-07-31 01:00:00	Engineering	Engineering
4	2002-01-05 00:00:00	2004-06-30 00:00:00	2008-07-31 01:00:00	Engineering	Senior Tool
5	2002-02-06 00:00:00	(NULL)	2008-07-31 01:00:00	Engineering	Design Engin
6	2002-02-24 00:00:00	(NULL)	2008-07-31 01:00:00	Engineering	Design Engin
7	2003-03-12 00:00:00	(NULL)	2008-07-31 01:00:00	Research and Development	Research and
8	2003-01-30 00:00:00	(NULL)	2008-07-31 01:00:00	Research and Development	Research and
9	2003-02-17 00:00:00	(NULL)	2008-07-31 01:00:00	Research and Development	Research and
10	2003-06-04 00:00:00	(NULL)	2008-07-31 01:00:00	Research and Development	Research and
11	2005-01-05 00:00:00	(NULL)	2008-07-31 01:00:00	Tool Design	Senior Tool
12	2002-01-11 00:00:00	(NULL)	2008-07-31 01:00:00	Tool Design	Tool Design
13	2005-01-23 00:00:00	(NULL)	2008-07-31 01:00:00	Tool Design	Tool Design
14	2005-01-30 00:00:00	(NULL)	2008-07-31 01:00:00	Engineering	Senior Desig
15	2005-02-18 00:00:00	(NULL)	2008-07-31 01:00:00	Engineering	Design Engin
16	2002-01-20 00:00:00	2003-08-15 00:00:00	2008-07-31 01:00:00	Purchasing	Inventory Management
17	2001-02-26 00:00:00	(NULL)	2008-07-31 01:00:00	Marketing	Sales and Marketing
18	2005-03-10 00:00:00	(NULL)	2008-07-31 01:00:00	Marketing	Sales and Marketing
19	2005-03-17 00:00:00	(NULL)	2008-07-31 01:00:00	Marketing	Sales and Marketing

Database: salesmart_db Table: dm_employee

Network Connection Details

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Connection-specific DNS S...	
Description	Intel(R) Dual Band Wireless-AC 7265
Physical Address	F8-34-41-70-B1-1A
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IPv4 DHCP Server	192.168.0.1
IPv4 DNS Servers	208.59.247.45 208.59.247.46
IPv4 WINS Server	
NetBIOS over Tcpip Enabl...	Yes
IPv6 Address	::4486:3093:8b77:f7d
Temporary IPv6 Address	::5429:7bb1:5827:9ecc
Link-local IPv6 Address	fe80::4486:3093:8b77:f7d%15
IPv6 Default Gateway	

Close

6. We will compare the job result with the below query result:

```
SELECT p.businessentityid, p.FirstName, p.LastName, p.ModifiedDate
, e.JobTitle, e.HireDate, e.CurrentFlag
, d.name AS departmentname, d.groupname AS departmentgroupname, edh.startdate AS
date_from, IFNULL(edh.enddate, '2999-12-31') AS date_to
FROM person p
, employee e
, employeedepartmenthistory edh
, department d
WHERE e.businessentityid = p.businessentityid
AND e.businessentityid = edh.businessentityid
AND edh.departmentid = d.departmentid
;
```

The screenshot displays the SQL Server Enterprise Manager interface. The left pane shows the 'Localhost' tree with the 'adventureworks' database selected. The center pane shows a query window with the following SQL statement:

```
USE adventureworks;
SELECT p.businessentityid, p.FirstName, p.LastName, p.ModifiedDate
, e.JobTitle, e.HireDate, e.CurrentFlag
, d.name AS departmentname, d.groupname AS departmentgroupname, edh.startdate AS date_from
, IFNULL(edh.enddate, '2999-12-31') AS date_to
FROM person p
, employee e
, employeedepartmenthistory edh
, department d
WHERE e.businessentityid = p.businessentityid
AND e.businessentityid = edh.businessentityid
AND edh.departmentid = d.departmentid
```

The bottom pane shows the '1 Result' tab with a table of 1000 rows. The table has columns: businessentityid, FirstName, LastName, ModifiedDate, JobTitle, departmentname, and departmentgroupname. The first few rows are:

businessentityid	FirstName	LastName	ModifiedDate	JobTitle	departmentname	departmentgroupname
2	Terri	Duffy	2002-02-24 00:00:00	Vice President of Engineering	Engineering	
3	Roberto	Tamburello	2001-12-05 00:00:00	Engineering Manager	Engineering	
4	Rob	Walters	2001-12-29 00:00:00	Senior Tool Designer	Engineering	
5	Gail	Erickson	2002-01-30 00:00:00	Design Engineer	Engineering	

A 'Network Connection Details' dialog box is open on the right, showing properties for the connection. The 'Connection-specific DNS Suffix' is 'adventureworks'. The 'Physical Address' is 'F8-34-41-70-B1-1A'. The 'IPV4 Address' is '192.168.0.43'. The 'IPV4 Subnet Mask' is '255.255.255.0'. The 'IPV4 Default Gateway' is '192.168.0.1'. The 'IPV4 DHCP Server' is '192.168.0.1'. The 'IPV4 DNS Servers' are '208.59.247.45' and '208.59.247.46'. The 'IPV4 WINS Server' is 'NetBIOS over Tcpip Enabled'. The 'IPV6 Address' is '4486:3093:b77b:7d4'. The 'Temporary IPV6 Address' is '5429:7bb1:5827:9ccc'. The 'Link-local IPV6 Address' is 'fe80::4486:3093:b77b:7d4%15'. The 'IPV6 Default Gateway' is 'fe80::4486:3093:b77b:7d4%15'.

Hence, we have **denormalize** the four tables in the **source_db** database and loaded into a **dimension** table called **dim_employee** in the **salesmart_db**.