

Oracle Academy
Database Programming with SQL
Instructor Resource Guide

SECTION 11 LESSON 1 – In-Class Interview

Slide 1: In-Class Interview

What to Watch For

Most students do not like to be singled out in class. Evaluate the interview process, not individual students.

Connections

After having had the opportunity to participate in the in-class interview, relate the experience to meeting with a client in the data-modeling process. Are the meetings with the client more than just what business processes they want modeled? Do clients form a first impression? Do clients evaluate your work based on your speaking and writing skills?

Slide 2: What Will I Learn?

No instructor notes for this slide

Slide 3: Why Learn It?

Relate your own experiences with job interviews. How did you prepare for the interview? What was the interview like?

Slide 4: Tell Me / Show Me – TYPES OF INTERVIEW

Summarize the differences. Traditional Interview focuses on what the candidate has accomplished such as completed college or worked as a graphic artist. Behavioral Interview focuses on past experiences and demonstrated competencies that relate to the job requirements, such as having been a team leader that completed an important project under extenuating circumstances.

Slide 5: Tell Me / Show Me – USING THE INTERNET

No instructor notes for this slide

Slide 6: Tell Me / Show Me – INTERVIEW PROCESS

Role play each step in the interview process.

Slide 7: Tell Me / Show Me – INTERVIEW PROCESS (continued)

Role play each step in the interview process.

Slide 8: Tell Me / Show Me – NONVERBAL SKILLS

Depending on local customs, modify the list as necessary.

Review the list of nonverbal communication skills that say "hire me" with the class.

Slide 9: Tell Me / Show Me – NONVERBAL SKILLS (continued)

No instructor notes for this slide

Slide 10: Tell Me / Show Me – THE INTERVIEW RUBRIC

Establish an order for interviewing either by drawing a number or asking for volunteers. Tell students how the interview will be conducted, what they should wear, and what they should bring to the interview. Review the Interview Rubric and how each student will be assessed. Let students know that evaluation is a means to make improvements, not a means to degrade them.

Slide 11: Summary – In this lesson you have learned to:
No instructor notes for this slide

Slide 12: Summary - Practice Guide
No instructor notes for this slide

SECTION 11 LESSON 2 – Sequences

Slide 1: Sequences

Lesson Preparation

For the practice exercises in this lesson, Oracle Application Express allows the creation of sequences and the use of a pseudocolumn called NEXTVAL to retrieve the next value in a generated sequence. However, the pseudocolumn called CURRVAL is not accessible in the Oracle Application Express environment. Once you retrieve the NEXTVAL from the sequence, you no longer have a "session" and the database no longer knows what's in CURRVAL. If a statement attempts to retrieve CURRVAL, a report error is generated: ORA-08002: sequence SEQ_D_SONGS_SQ.CURRVAL is not yet defined in this session

What to Watch For

You must qualify NEXTVAL with the sequence name. NEXTVAL must be used first (filled) before CURRVAL can be referenced.

Slide 2: What Will I Learn?

No instructor notes for this slide

Slide 3: Why Learn It?

No instructor notes for this slide

Slide 4: Tell Me / Show Me – THE SEQUENCE OBJECT

No instructor notes for this slide

Slide 5: Tell Me / Show Me – THE SEQUENCE OBJECT (continued)

Although a sequence can be used for multiple tables, this is not a good idea, because since each number in the sequence is used only once, each table will have missing values (the ones used by the other tables).

Slide 6: Tell Me / Show Me – CREATE SEQUENCE

Using the graphic description of the SEQUENCE syntax, explain what each term means in general terms.

Slide 7: Tell Me / Show Me – CREATING A SEQUENCE

No instructor notes for this slide

Slide 8: Tell Me / Show Me – CREATING A SEQUENCE (continued)

Give an example of CYCLE such as phone numbers. If a phone number is a sequence issued by the phone company, once you change numbers, someone else can get that number.

Slide 9: Tell Me / Show Me – CONFIRMING SEQUENCES

Relate CACHE to computer cache used by browsers to store web pages. When visiting a website, your browser will cache or make a copy of the website for faster viewing in your next visit. In other words, you are calling up a copy from memory. .

Slide 10: Tell Me / Show Me –NEXTVAL AND CURRVAL PSEUDOCOLUMNS

Relate NEXTVAL to being in a busy store and being required to "take a number." The machine generates a ticket (NEXTVAL) that the customer takes. When the clerk is ready to wait on the customer, CURRVAL is called.

Slide 11: Tell Me / Show Me – NEXTVAL AND CURRVAL PSEUDOCOLUMNS (continued)

No instructor notes for this slide

Slide 12: Tell Me / Show Me – NEXTVAL AND CURRVAL PSEUDOCOLUMNS (continued) Suppose now you want to hire employees to staff..

No instructor notes for this slide

Slide 13: Tell Me / Show Me – NEXTVAL AND CURRVAL PSEUDOCOLUMNS (continued) The CURRVAL pseudocolumn in the example below is used to...

No instructor notes for this slide

Slide 14: Tell Me / Show Me – USING A SEQUENCE

Briefly review the rules for NEXTVAL and CURRVAL. In the Application Builder final project, sequences will be automatically generated in the Oracle Application Express environment. Students will see them in a real application.

Slide 15: Tell Me / Show Me – USING A SEQUENCE (continued)

No instructor notes for this slide

Slide 16: Tell Me / Show Me – USING A SEQUENCE (continued)

To continue our London Marathon example, the ...

No instructor notes for this slide

Slide 17: Tell Me / Show Me – USING A SEQUENCE (continued)

To view the current value for the runners-Id_seq, CURRVAL is ...

No instructor notes for this slide

Slide 18: Tell Me / Show Me – Although sequence generators issue sequential...

Explain why CURRVAL cannot be accessed in the Oracle Application Express environment (refer to the instructor notes on the title slide of this lesson). Explain COMMIT and ROLLBACK. COMMIT represents the point in time where the user has made all the changes he or she wants to have logically grouped together, and because no mistakes have been made, the user is ready to save the work. When a COMMIT statement is issued, the current transaction ends making all pending changes permanent. ROLLBACK enables the user to discard changes made to the database. When a ROLLBACK statement is issued, all pending changes are discarded. Explain that frequently used sequences should be created with caching to improve efficiency. For cached sequences, there is no way to find out what the next available sequence value will be without actually obtaining and using up that value. It is recommended that users resist finding the next sequence value. Trust the system to provide a unique value each time a sequence is used in an INSERT statement.

Slide 19: Tell Me / Show Me – Viewing the Next Value

No instructor notes for this slide

Slide 20: Tell Me / Show Me – MODIFYING A SEQUENCE

No instructor notes for this slide

Slide 21: Tell Me / Show Me – MODIFYING A SEQUENCE (continued)

No instructor notes for this slide

Slide 22: Tell Me / Show Me – ALTER SEQUENCE GUIDELINES

No instructor notes for this slide

Slide 23: Tell Me / Show Me – REMOVING A SEQUENCE

No instructor notes for this slide

Slide 24: Tell Me / Show Me - Terminology

CURRVAL-returns the current sequence value

CREATE SEQUENCE-command that automatically generates sequential numbers

Sequences-generates a numeric value

NO MINVALUE-specifies a minimum value of 1 for an ascending sequence and $-(10^{26})$ for a descending sequence (default)

NO MAXVALUE-specifies a maximum value of 10^{27} for an ascending sequence and -1 for a descending sequence (default)

NEXTVAL-returns the next available sequence value

CYCLE/ NOCYCLE-specifies whether the sequence continues to generate values after reaching its maximum or minimum values

MAXVALUE-specifies a maximum or default value the sequence

can generate

CACHE/ NOCACHE-specifies how many values the Server pre-allocates and keeps in memory

INCREMENT BY-specifies the interval between sequence numbers

MINVALUE-specifies the minimum sequence value

STARTS WITH-specifies the first sequence number to be generated

Slide 25: Summary – In this lesson you have learned to:

No instructor notes for this slide

Slide 26: Summary - Practice Guide

No instructor notes for this slide

SECTION 11 LESSON 3 – Indexes and Synonyms

Slide 1: Indexes and Synonyms

Be sure to explain that the use of indexes in database activity is necessary for much larger databases than the students have used in this course. When large tables are mentioned, it refers to a lot of rows of data. All tables the students use in this course are small.

Slide 2: What Will I Learn?

No instructor notes for this slide

Slide 3: Why Learn It?

No instructor notes for this slide

Slide 4: Why Learn It? (continued)

Relate creating an index to systematic ways in which other types of information are organized, such as the aisles in a grocery store, departments in a clothing store, numbered spaces in a parking garage, or the concourses at an airport. All make finding what we're looking for much faster and easier.

Slide 5: Tell Me / Show Me – INDEXES

No instructor notes for this slide

Slide 6: Tell Me / Show Me – INDEXES (continued)

Use the graphic to explain that the primary key in this table ID will automatically have an index created.

Slide 7: Tell Me / Show Me – TYPES OF INDEXES

The decision to create indexes is a global, high-level decision. Creation and maintenance of indexes is often a task for the database administrator.

Slide 8: Tell Me / Show Me – CREATING AN INDEX

No instructor notes for this slide

Slide 9: Tell Me / Show Me – CREATING AN INDEX (continued)

Ask students to execute the command to create an index on the title column in the DJ on Demand table. Confirm the index was created by querying the INDEXES in the data dictionary.

```
CREATE INDEX d_cds_idx
ON d_cds(title);
SELECT index_name
FROM USER_INDEXES;
SELECT ic.index_name, ic.column_name, ic.column_position col_pos, ix.uniqueness
FROM user_indexes ix, user_ind_columns ic
WHERE ic.index_name = ix.index_name
AND      ic.table_name = 'D_CDS';
```

Slide 10: Tell Me / Show Me – WHEN TO CREATE AN INDEX

Review each item on the list. This is an important list for students to know and understand.

Slide 11: Tell Me / Show Me – WHEN NOT TO CREATE AN INDEX

No instructor notes for this slide

Slide 12: Tell Me / Show Me – WHEN NOT TO CREATE AN INDEX (continued)

No instructor notes for this slide

Slide 13: Tell Me / Show Me – COMPOSITE INDEX

Ask students to give an example where a composite (multiple column) index may be useful. Possible answer: When two or more columns are searched as a unit. For example: create index artists_name_ind on artists(fname, lname)

Slide 14: Tell Me / Show Me – COMPOSITE INDEX (continued)

No instructor notes for this slide

Slide 15: Tell Me / Show Me – CONFIRMING INDEXES

To illustrate the join condition shown, ask students to execute the query.

Slide 16: Tell Me / Show Me – FUNCTION-BASED INDEXES

No instructor notes for this slide

Slide 17: Tell Me / Show Me – FUNCTION-BASED INDEXES (continued)

Ask students to enter the CREATE INDEX code shown and execute the SELECT * statement.

Slide 18: Tell Me / Show Me – Function-based indexes defined with the...

Let students know that to create a function-based index in their own schema, they must have the CREATE INDEX and QUERY REWRITE system privileges. To create the index in another schema or on another schema's table, they must have the CREATE ANY INDEX and GLOBAL QUERY REWRITE privileges. The table owner must also have the EXECUTE object privilege on the functions used in the function-based index.

Slide 19: Tell Me / Show Me – For example, the following statement...

No instructor notes for this slide

Slide 20: Tell Me / Show Me – To ensure that the Oracle Server uses...

No instructor notes for this slide

Slide 21: Tell Me / Show Me – REMOVING AN INDEX

Ask students to DROP any indexes created.

Slide 22: Tell Me / Show Me – SYNONYMS

No instructor notes for this slide

Slide 23: Tell Me / Show Me – SYNONYMS (continued)

No instructor notes for this slide

Slide 24: Tell Me / Show Me – SYNONYMS (continued)

CREATE [PUBLIC]

Demonstrate creating a synonym and have students create a synonym for one of their copy_tablenames. Note: An insufficient privileges error occurs when using the CREATE PUBLIC SYNONYM. CREATE SYNONYM is allowed.

Slide 25: Tell Me / Show Me – SYNONYMS (Guidelines – The ...

Have students DROP SYNONYM.

Slide 26: Tell Me / Show Me – CONFIRMING SYNONYMS

Have students DROP SYNONYM.

Slide 27: Tell Me /Show Me - Terminology

DROP INDEX-Removes an index

Function- based index-stores the indexed values and uses the index based on a SELECT statement to retrieve the data

Synonym-gives alternative names to objects

Confirming index-Confirms the existence of indexes from the USER_INDEXES data dictionary view

Unique index-The Oracle Server automatically creates this index when you define a column in a table to have a

PRIMARY KEY or a UNIQUE KEY constraint

Non-unique index-schema object that speeds up retrieval of rows

Composite index-an index that you create on multiple columns in a table

CREATE PUBLIC SYNONYM-to refer to a table by another name to simplify access

Slide 28: Summary – In this lesson you have learned to:

No instructor notes for this slide

Slide 29: Summary - Practice Guide

No instructor notes for this slide

Notes For Practice Activities:

In Class Interview S11 L01

Try It / Solve It

1. Traditional Interview: Focus on what the candidate has accomplished or wants to accomplish. Behavioral Interview: Focus on past experiences and demonstrated competencies that relate to the job requirements.
2. Rather than merely telling the interviewer what they would do in a situation, as in a regular interview, in a behavioral interview the candidate must describe, in detail, how they handled a situation in the past.
3. The purpose of any interview is to determine if the candidate can do the job and will fit into the business culture of the company. In both types of interview, there is always a process of introductions, company information, candidate response to questions, and closing comments.
4. Traditional Questions: Candidate is allowed to generalize and theorize.
"What are your three major accomplishments?"
"What have you disliked in your past jobs?"
"What kinds of people frustrate you?"
"What is your ideal job?"
"Tell me about your last job?"
5. Look for plans that include elements such as, "research company via the web; write three questions to ask the interviewer at the end of the interview; list my current qualifications that would make me an excellent candidate; what I'll say when asked why I feel I am the best candidate."

Sequences S11 L02

Try It / Solve It

1. CREATE TABLE seq_d_songs
AS SELECT *
FROM d_songs;
SELECT *
FROM seq_d_songs;
2. CREATE SEQUENCE seq_d_songs_seq
INCREMENT BY 2
START WITH 100
MAXVALUE 1000
NOCACHE

NOCYCLE;

3. SELECT sequence_name, min_value, max_value,
increment_by, last_number
FROM user_sequences;

4. INSERT INTO seq_d_songs(id, title, duration, artist, type_code)
VALUES(seq_d_songs_seq.NEXTVAL, 'Island Fever', '5 min', 'Hawaiian Islanders',12);
INSERT INTO seq_d_songs(id, title, duration, artist, type_code)
VALUES(seq_d_songs_seq.NEXTVAL, 'Castle of Dreams', '4 min', 'The
Wanderers',77);

5. SELECT seq_d_songs_seq.CURRVAL
FROM dual;

6. Reduces amount of application code so faster
Creates unique numbers
Shareable (this can cause problems, so is “useful” with care)

7. Cache sequences in memory provide faster access to sequence values

8. - rolling back a statement containing a sequence, the number is lost.
- a system crash. If the sequence caches values into the memory and the system crashes, those values are lost.
- the same sequence being used for multiple tables. If you do so, each table can contain gaps in the sequential numbers.

Use the following as an extension activity or as an additional assignment.

(1) Create a table called "students." You can decide which columns belong in that table and what data types these columns require. (The students may create a table with different columns; however, the important piece that must be there is the student_id column with a numeric data type. This column length must allow the sequence to fit, e.g. a column length of 4 with a sequence that starts with 1 and goes to 10000000 will not work after student #9999 is entered.)

```
CREATE TABLE students  
(student_id number (5),  
first_name VARCHAR2(10),  
last_name VARCHAR2(15),  
section number(4));
```

(2) Create a sequence called student_id_seq so that you can assign unique student_id numbers for all students that you add to your table.

```
CREATE SEQUENCE student_id_seq  
INCREMENT BY 1
```

```
START WITH n
MAXVALUE nnnnn
NOCACHE
NOCYCLE ;
```

Ask students what it means if they specified NOCYCLE when they defined their sequence. It means numbers will not be reused. Ask why that might be important. (Perhaps the school wants to keep track of how many different students have ever attended the school. Perhaps students may leave the school, and then come back to the school, but still keep their original student id. This example is great for explaining NOCYCLE -- can you use a similar example in the lecture content?)

(3) Now write the code to add students to your STUDENTS table, using your sequence “database object.”

```
INSERT INTO students (student_id, first_name, last_name, section)
VALUES( student_id_seq.NEXTVAL, 'Joe', 'Smith', 1);
INSERT INTO class(student_id, first_name, last_name, section)
VALUES( class_student_id_seq.NEXTVAL, 'Fred', 'Jones', 10);
```

Again, their code could be different depending on what columns they used to create their tables. The important part for students to include in this code is the use of NEXTVAL. You may want to reiterate the CURRVAL issue with Oracle Application Developer here.

Indexes and Synonyms S11 L03

Try It / Solve It

1. Schema object used to speed up retrieval of rows by using a pointer.
2. A ROWID is a base 64 string representation of the row address containing block identifier, row location in the block, and the database file identifier. The fastest way to access any particular row is by referencing its ROWID.
3. An index is automatically created for a PRIMARY or UNIQUE KEY constraint.
4.

```
CREATE INDEX cd_number_idx
ON d_track_listings(cd_number);
```

There are two ways to confirm that the index was created. The first way is to use the Data Browser to find a database object with type=INDEX and name=CD_NUMBER_IDX.

The second way is to query the data dictionary tables. Below is a sample query using the tables, USER_INDEXES and USER_IND_COLUMNS.

```
SELECT ic.index_name, ic.column_name,
ic.column_position col_pos, ix.uniqueness
FROM user_indexes ix, user_ind_columns ic
```

```
WHERE ic.index_name = ix.index_name  
AND ic.table_name = 'D_TRACK_LISTINGS';
```

```
5. SELECT ic.index_name, ic.column_name,  
ic.column_position col_pos, ix.uniqueness  
FROM user_indexes ix, user_ind_columns ic  
WHERE ic.index_name = ix.index_name  
AND ic.table_name = 'D_SONGS';
```

An alternative solution using the join statement is:

```
SELECT index_name, ic.column_name,  
ic.column_position As col_pos, ix.uniqueness  
FROM user_indexes ix JOIN user_ind_columns ic  
USING (index_name)  
WHERE ic.table_name = 'D_SONGS';
```

```
6. SELECT index_name, table_name, uniqueness  
FROM user_indexes  
WHERE table_name = 'D_EVENTS';
```

```
7. CREATE SYNONYM dj_tracks  
FOR d_track_listings;
```

```
8. CREATE INDEX lower_d_partners_idx  
ON d_partners (LOWER(last_name));  
SELECT *  
FROM d_partners  
WHERE LOWER(last_name) = 'tsang';
```

```
9. CREATE SYNONYM name FOR d_track_listings
```

```
10. DROP SYNONYM name
```