Database Management Systems II (DBMS-2004)
Mid-term Project Part D – Stored Procedures

This is the final part of the Mid-term Project. In this part you will add to the PL/SQL code you wrote in parts A through C to automatically extract information about a schema into which you are logged (in this case, your schema in DBMSDBII). This version will be a useful tool to explore Oracle databases in the future.

This final stage will add the following to the code you developed in Parts A, B and C.

- The stored procedure Extract_FK_Constraint

Specifications:

1. **Before beginning, run the SQL Script 'Run_SetUp.bat'. This batch file will run a SQL script to prepare your schema for this part of the project.**

2. Stored Procedure Extract_Tables:
   - Modify the procedure to have an optional parameter.
     - This parameter may contain the name of the table to extract (instead of extracting all tables in the schema).
     - The person executing the script must be able to use the LIKE wildcards to get all tables whose name matches the passed in string (e.g. a parameter might be '_ust%').
     - The user can specify any case they choose, the extract must convert the value in the parameter to uppercase.
     - If no value is provided for the optional parameter then all tables in the schema should be extracted.
     - To test if the optional parameter works or not, sign on to SQL Plus and invoke the stored procedure with no parameter at all, a full table name and a partial table name with a wildcard character.
   - Modify to contain a new section that creates ALTER TABLE statements to add Foreign Key constraints for all tables.
     - Lines 71-73 and 87-89 of the sample output demonstrate what this stored procedure must create in this new section.

3. Stored Procedure Extract_FK_Constraint:
   - Will process the 'Foreign Key' constraints defined on the current table being processed.
   - It is possible a table may not have any Foreign Key constraints defined, or it may have many foreign keys defined.
   - This stored procedure must process all Foreign Keys defined on the current table with a single call to this procedure.
   - If there are any foreign keys, they must be added at the end of the script using 'ALTER TABLE' in the new section created in 1 above.
   - The headings showing the start of the ALTER TABLE statements (lines 74-76 in the sample output) and the line showing the end of the section (lines 87-88 in the sample output) only appear when the table does have Foreign Keys defined.
   - Each foreign key must be added using a separate ALTER TABLE (Lines 77-81 and 82-87 of the sample output demonstrate what this stored procedure must create).

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4. Stored Procedure Extract_PK_Constraint
   - Define an exception called 'NO_PK_DEFINED' (do not associate an error number with this exception).
   - If there is no primary key defined for the table, throw the 'NO_PK_DEFINED' exception.
   - In this procedure, catch the thrown exception, and add a comment to the output indicating the table does not have a Primary Key.
   - All exceptions other than 'NO_PK_DEFINED' should propagate to the execution environment.
   - Line 66 of the sample output demonstrates what this stored procedure must create.

5. The code of the procedures/functions must contain comments that describe what the procedure does (at the top of the procedure code) as well as comments for major sections of code within the procedure.

6. Objects, variables must all be named using a consistent naming convention.

7. All output must go to a file called Create_Tables_YourLastName.SQL.

8. The format of the SQL CREATE TABLE Statements must match exactly the sample shown in Figure 1.

9. Make sure that your SERVEROUTPUT is set to a SIZE of at least 10,000.

10. Please ask your instructor for assistance. Don't get stuck!

IMPORTANT:

- Code that does not compile or run on the instructor laptop will not be marked.
- Code that does not output to the proper file when run on the instructor laptop will not be marked.

Figure 1: Sample result from PL/SQL code run (your tables will differ).

```
 1      ---- Oracle Catalog Extract Utility V4.0 ----
 2      ----
 3      ---- Run on Nov 3, 2015 at 12:50
 4      ----
 5      ---- S T A R T I N G   T A B L E   D R O P S
 6      ----
 7      DROP TABLE AD_MATERIALS;
 8      DROP TABLE CLIENTS;
 9      DROP TABLE CUSTOMERS;
10      ----
11      ---- T A B L E   D R O P S   C O M P L E T E D
12      ----
13      ----
14      ---- S T A R T I N G   T A B L E   C R E A T E
15      ----
16      --   Start extracting table BINADS
17      CREATE TABLE BINADS (
18        PRODNO                          VARCHAR2(15)  NOT NULL
19      , IMAGE                           BLOB
20      ================================================================================
21      === EXCEPTION -20100 Raised - ORA-20100: *** Unknown data type BLOB ***
22      === Unable to complete table generation for BIN_ADS
23      ================================================================================
24                           ); -- END of Table ADS creation
25      --
```

```
--
--   Start extracting table COURSES
CREATE TABLE CLIENTS (
  CLIENT                         NUMBER(6)                         NOT NULL
, FIRSTNAME                      VARCHAR2(35)
, LASTNAME                       VARCHAR2(35)
, CLIENTSINCE                    DATE           DEFAULT SYSDATE    NOT NULL
, CREDITCARD                     NUMBER(12)                        NOT NULL
, CONSTRAINT ORDERLINESPK
     PRIMARY KEY(CLIENT )
, CONSTRAINT VALIDCREDITCARD
     UNIQUE (CREDITCARD)
, CONSTRAINT VALIDDATECHECK
     CHECK (CLIENTSINCE <= CURRENT_DATE)
                      ); -- END of Table COURSES creation
--
--
--   Start extracting table ORDERLINES
CREATE TABLE ORDERLINES (
  ORDERLINE                       NUMBER(6)                        NOT NULL
, ORDER                           NUMBER(6)                        NOT NULL
, PRODNO                          VARCHAR2(15)                     NOT NULL
, SUPPLIER                        NUMBER(6)                        NOT NULL
, UNITPRICEPAID                   NUMBER(8,2)
, QUANTITY                        NUMBER(4)     DEFAULT 0.00
, STATUS                          CHAR(1)       DEFAULT 'P'        NOT NULL
, CONSTRAINT ORDERLINESPK
     PRIMARY KEY(ORDER , ORDERLINE )
, CONSTRAINT VALIDSTATUS
     CHECK (STATUS IN ('P', 'L', 'F'))
                        ); -- END of Table CUSTOMERS creation
--
--
--   Start extracting table REGISTRATIONS
CREATE TABLE REGISTRATIONS (
  REGID                       NUMBER(6)                            NOT NULL
, REGDATE                     DATE            DEFAULT SYSDATE
, STUDENTID                   NUMBER(7)                            NOT NULL
, COURSEID                    NUMBER(6)                            NOT NULL
, FEEPAID                     NUMBER(6,2)                          NOT NULL
-- *** WARNING *** No Primary Key Defined
                           ); -- END of Table REGISTRATIONS creation
----
---- T A B L E  C R E A T E  C O M P L E T E D
----
----
---- S T A R T I N G   T A B L E   A L T E R
----
--
--
-- Start Alter of table REGISTRATIONS
ALTER TABLE REGISTRATIONS
   ADD CONSTRAINT TAKINGFK
       FOREIGN KEY (COURSEID)
       REFERENCES COURSES;
--
ALTER TABLE REGISTRATIONS
   ADD CONSTRAINT STUDYFK
       FOREIGN KEY(STUDENTID)
      REFERENCES STUDENTS
      ON DELETE CASCADE;
--
-- End of Alter Table REGISTRATIONS
----
---- T A B L E  A L T E R   C O M P L E T E D
----
---- Oracle Catalog Extract Utility V4.0 ----
---- Run Completed on Nov 3, 2015 at 12:52
```

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Submit the following:

1. One text file called **YourLastName_D_Compile.SQL**. This file will contain your stored procedure creation code:
    - One stored procedure named Extract_Tables.
    - One stored procedure named Extract_Columns.
    - One stored procedure named Extract_PK_Constraints
    - One stored procedure named Extract_Unique_Constraints
    - One stored procedure named Extract_Check_Constraints
    - One stored function named Get_Constraint_Columns
    - One stored procedure named Extract_FK_Constraints

2. One text file called **YourLastName_D_Run.SQL**.
    - This file will contain the SQL code necessary to run your stored procedures and spool output to the file specified in '3' below.

3. One text file called **Create_Tables_YourLastName.SQL**.
    - This file will contain the code generated by running 'Extract_Tables'. Your code will produce this file each time 'Extract_Tables' runs.
    - Note: the line numbers to the left of the sample output on Page 2 are only for reference within this document. Do not produce line numbers!

4. One text file named **YourLastName_D.BAT**.
    - This file prompts to compile or run your stored procedures.
    - DOS commands cannot display on the screen when this batch file runs.
    - Prompt the user to 'C'ompile, 'Run'.
        - If they choose 'C'ompile, run the SQL script **YourLastName_D_Compile.SQL.** Make sure to pause so you can see the output to determine if the procedures compiled correctly. After the user hits enter terminate the batch file.
        - If they choose 'R'un, then run the SQL script **YourLastName_D_Run.SQL**. Do not pause - the batch file must terminate immediately when the SQL script completes.

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The following standards are to be used when coding:

- Keywords are in Uppercase
- Names are coded in camel case (First letter capitalized)
- Each clause is placed on a line by itself

Submission Instructions

Compress all files into a zip archive named *lastname,firstname_PartD* and submit the archive to the appropriate LEARN dropbox.

Marking Guidelines

The final part contributes 70% to the final mark for the Mid-Term Project. In order to be eligible for marks on this component of the assignment, a submission to the dropbox must be made. If no submission to the dropbox is made the mark for the final component will be zero.

A rubric is used to allocate marks on this component. See the Learn dropbox.