

AHSANULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Course No: CSE4126

Course Title: Distributed Database Systems Lab

Fall 2020 | Lab Final Examination | Marks 30

Time: 1 hour 40 mins (1 hr 30 mins for writing + 10 mins for uploading)

1. Answer the following questions (answers can be written in paper or in a txt file) 10

a. Which command is used to view errors in a PL/SQL block? 1

b. Which exception should we use to handle the following error? 1

```
ERROR at line 1:  
ORA-01422: exact fetch returns more than requested number of rows  
ORA-06512: at line 5
```

c. Which exception will most favorably handle the following error? 1

```
ERROR at line 1:  
ORA-00001: unique constraint (SYSTEM.SYS_C0010648) violated
```

d. What is the main difference between function and procedure in PL/SQL? 1

e. What is the difference between ROW LEVEL trigger and STATEMENT LEVEL trigger? 2

f. What is the simplest unit in PL/SQL? 1

g. Can we use array in PL/SQL? Give an example. 1

h. Write down the purposes of :OLD and :NEW for a ROW LEVEL trigger on INSERT, UPDATE and DELETE operation. 2

2. Solve the following two questions using PL/SQL. 6

(All the codes will be in a single sql file named "Task2.sql")

a) In DNA strings, symbols 'A' and 'T' are complements of each other, as are 'C' and 'G'. The reverse complement of a DNA string **S** is the string **S'** formed by reversing the symbols of **S**, then taking the complement of each symbol (e.g., the reverse complement of "GTCA" is "TGAC").

Given: A DNA string **S** (**sample input:** AAAACCCGGT)

Return: The reverse complement **S'** of **S**. (**sample output:** ACCGGGTTTT)

b) Given two strings **S** and **T** of equal length, the Hamming distance between **S** and **T**, denoted **D(S, T)**, is the number of corresponding symbols that differ in **S** and **T**.

Given: Two DNA strings **S** and **T** of equal length

(**sample input:** GAGCCTACTAACGGGAT and CATCGTAATGACGGCCT)

Return: The Hamming distance **D(S, T)** (**sample output:** 7)

These problems are related to Bio-informatics and can be found at <http://rosalind.info/problems/list-view/>

3. Consider, we have a database table where information about some popular apps are listed. If you run the following code, you will see the information. 7

```
--CREATED BY: G. M. Shahariar
--SYSTEM DATE: 04-OCT-2021 04:39 AM
clear screen;
drop table APPS;

create table APPS(APP_ID number, APP_NAME VARCHAR2(12), RELEASE_DATE DATE);

insert into APPS values(100,'SKYPE','19-MAR-1990');
insert into APPS values(200,'ZOOM','21-JAN-1995');
insert into APPS values(1000,'MESSENGER','3-JUL-1989');
insert into APPS values(100,'SKYPE','19-MAR-1990');
insert into APPS values(2,'SIGNAL','21-FEB-2015');
insert into APPS values(300,'TELEGRAM','10-NOV-2014');

commit;
select * from APPS;
```

Some apps were released a long time ago, whereas some of them are developed recently. Write a PL/SQL function **FIND_APPS** that receives an app ID. The function will print whether that app is in usage longer than 12 years or not. Use necessary exception handling inside the function. You will get hints for which exceptions to use by looking at the provided data. **FIND_APPS** function should be declared inside a package named **APP_SEPARATE**. **All the codes will be in a single sql file named "Task3.sql"**

To work with dates in pl/sql: https://www.tutorialspoint.com/plsql/plsql_date_time.htm

4. Create a PL/SQL trigger named '**FIX_NAME**' which will ensure that when a new row is inserted on the **APPS** table, the name of the app is always in capital letters. If the user uses names such as "InsTagraM" or "instagram" in the INSERT statement, your trigger will fix the name to "INSTAGRAM" before insertion. **All the codes will be in a single sql file named "Task4.sql"** 3
5. Write a PL/SQL code in a single sql file named **"Task5.sql"** to implement the following – 4
- Prompt to user: "Enter last 3 digits of your ID = "
 - Nested Anonymous Blocks
 - Take Input in the outer block
 - Check Even/Odd in the inner block
 - Print "Even"/"Odd" in the outer block

Note: It is possible to take input inside PL/SQL Begin-End block. This is not a valid/Invalid type question answer. If you do not know, search on Google, you have the internet.

Instructions:

- You will submit all the files in ZIP format.
- Name the ZIP file with your ID. Example – 170204XXX.zip
- In zip file – there will be 4 sql files (for question – 2, 3, 4, 5) and 1 text/pdf file (for question 1)