SIM GLOBAL EDUCATION

UNIVERSITY OF WOLLONGONG AUSTRALIA

School of Computing and Information Technology

Student to complete:

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CSCI235
Database Systems

Final Examination Paper
Session 2 2020
3 June 2020

Exam duration	3 hours and 10 minutes
Weighting	40% of the subject assessment
Marks available	40 marks
Items permitted by examiner	Text-book, Lecture slides, and Tutorial notes
Directions to students	4 questions to be answered. Marks for each question are shown beside the question. All answers must be written / typed neatly in the spaces provided. **No asking for explanation of question is allowed during the examination. However, if you suspect that there is a typo or incorrect question, you can ask the invigilator to confirm.**

This examination is a take-it-home examination to be done on-line on the date of examination.

Version 1.1

Question 3 refers to the relational database with a schema described below:

The hospital database contains information about the treatments of patients performed by the doctors. The database also contains information on the prescriptions ordered by the doctors. The schemas of relational tables, the meanings of attributes and specifications of primary, candidate, and foreign keys are given below.

HOSPITAL

HospitalCd	Hospital Code
Name	Name of the hospital
Address	Address of the hospital
Estate	The estate where the hospital is located
PostalCode	The postal code of the address
EstablishedDate	The date the hospital was established

Primary key = HospitalCd

DOCTOR

DoctorId	The identification number of the doctor
Name	Name of the doctor
Citizenship	The citizenship of the doctor
WorkFor	The hospital the doctor is working for

Primary key = DoctorId
Foreign key = WorkFor references HOSPITAL (HospitalCd)

PATIENT

NRIC	The NRIC of the patient
Name	The name of the patient
DateOfBirth	The birth date of the patient
Sex	The gender of the patient
Address	The residential address of the patient
Estate	The estate where the patient lives
PostalCode	The postal code of the address

Primary key = NRIC

TREATMENT

DoctorId	The doctor identification number
NRIC	The NRIC of the patient
TreatmentDate	The treatment date
Description	Description of the treatment

Primary key = (DoctorId, NRIC, TreatmentDate)
Foreign key = (DoctorId) references DOCTOR(DoctorId)
Foreign key = (NRIC) references PATIENT(NRIC)

PRESCRIPTION

DoctorId	The doctor identification number
NRIC	The NRIC of the patient
TreatmentDate	The treatment date
ItemNum	The item number of the prescription
Drug	The drug prescribed by the doctor
Dosage	The dosage prescribed

Primary key = (DoctorId, NRIC, TreatmentDate, ItemNum)
Foreign key = (DoctorId, NRIC, TreatmentDate) references TREATMENT(DoctorId, NRIC, TreatmentDate)

Question 3 - (Total 12 marks)
PL/SQL

Time allocated: 50 minutes
Start time: 11:30 am SGT
End time: 12:20 pm SGT
Submission time start: 12:15 pm SGT
Submission time end: 12:25 pm SGT

a) Implement a stored PL/SQL function PATIENT(DoctorId) that finds the NRIC of all patients who received three or more treatments from the same doctor (DoctorId). The function should return a string of NRICs separated with one or more spaces. Assuming the identifier of the doctor (DoctorId) treating the patients is passed to the function as a value of parameter.

(6.0 marks)

b) Implement a stored PL/SQL procedure that adds to the database information about a new doctor. The information about the new doctor should be passed into the procedure through the values of parameters. The procedure must check the validity of hospital code before the verification of a referential integrity constraint. A hospital code is a sequence of characters that starts from a letter 'H' and is followed by two digits. Hint: You may use pattern matching ‘like’ and ‘_’ (underscore) of SQL to achieve your verification of valid hospital code. **(6.0 marks)**

End of specification

Answer:

A)

```
Create or replace function PATIENT(docID in varchar2)

Return varchar2
Is
Result varchar2(2000);

Begin
        For aCursor in (select NRIC
                                From treatment
                                Where count(NRIC) > 3
                                And DoctorID = docID)

        Loop
                Result := result || aCursor.NRIC || ‘, ’;
        End loop;
Return result;

End PATIENT;
/
```

b)

```
create or replace procedure NEWDOCTOR (docID in varchar2, dname in varchar2, citizen in varchar2, hosp in varchar2) is
```

Answer:

```
begin
        if instr(hosp, '^H[0-9]{2}$') then
                insert into doctor(DoctorID, Name, Citizenship, Workfor)
                values (docID, dname, citizen, hosp);

        else
                raise_application_error(-20001, 'Invalid hospital ID' || ' ' || hosp);

        end if;

end NEWDOCTOR;
/
```

Answer:

Answer: