CS-GY 6083 - B, Spring 2022
Principles of Database Systems
Assignment: 4 [100 points]

Please submit your assignment on NYU Brightspace course site with a single PDF document attachment. Please mention Student ID, Name, Course, Section Number, and date of submission on first page of your submission. Each table in your submission of SQLs and their results should have your initial as prefix, e.g. AP_CUSTOMER, AP_ACCOUT etc. You can use either Oracle or MySQL for this assignment.

Q1) To write a database procedure (Oracle or MySQL) [50 points]

The HR department intend to give salary increment to all employees at every six months with specific base increment amount, for example $500. Each time HR department gives salary increment, the base increment amount is not same and it varies. So, application team intend to write a database procedure, that takes base salary increment amount as input to the procedure, for example base increment amount is N.

The procedure should update everyone's salary with following criteria, for imputed base increment value of N as $500 as an example.

Everyone's salary is increased by at least, the value N (e.g. 500 if N=500)
Number of years of service >= 5, then salary is increased with 10% more of amount N (e.g. 550 if N=500)
Number of years of service >=10, then salary is increased with 15% more of amount N (e.g. 575 if N=500)
Number of years of service >=15 then salary is increased with 20% more of amount N (e.g. 600 if N=500)

Write a database procedure that works as mentioned above logic. Your procedure name should have your initial as prefix, e.g. AP_RAISE_SAL.

Use the table and its data as in SQL tutorial, i.e. AP_EMP (you must have this table with your initial)

Submit:

a) **Procedure code (Oracle or MySQL)**
b) **Before and after result of procedure run**

If you are using Oracle, provide result of following,

SELECT empno, efname||elname “ENAME”, sal,hiredate from ap_EMP order by 4;
execute raise_sal (10);
SELECT empno, efname||elname “ENAME”, sal,hiredate from ap_EMP order by 4;

If you are using MySQL, provide result of following,

SELECT empno,concat(efname,elname) “ename”, sal,hiredate from ap_EMP order by 4;
call raise_sal (10);
SELECT empno,concat(efname,elname) “ename”, sal,hiredate from ap_EMP order by 4;

Q2) To resolve query with BITMAP INDEXES [50 points]

Create patient table, your table name should have your initial as prefix

```
create table AP_PATIENT
(patient_id number(10),
gender char(1),
marital_status char(1),
race char(1),
primary key (patient_id));
```

Populate data to your patient table, with exact data as follow.

```
insert into ap_patient (patient_id,gender,marital_status,race) values (10001, 'F','S','A');
insert into ap_patient (patient_id,gender,marital_status,race) values (10002, 'F','S','W');
insert into ap_patient (patient_id,gender,marital_status,race) values (10003, 'F','S','B');
insert into ap_patient (patient_id,gender,marital_status,race) values (10004, 'F','M','A');
insert into ap_patient (patient_id,gender,marital_status,race) values (10005, 'F','D','B');
insert into ap_patient (patient_id,gender,marital_status,race) values (10006, 'F','W','A');
insert into ap_patient (patient_id,gender,marital_status,race) values (10007, 'F','M','W');
insert into ap_patient (patient_id,gender,marital_status,race) values (10008, 'F','W','B');
insert into ap_patient (patient_id,gender,marital_status,race) values (10009, 'M','S','A');
insert into ap_patient (patient_id,gender,marital_status,race) values (10010, 'M','S','W');
insert into ap_patient (patient_id,gender,marital_status,race) values (10011, 'M','S','B');
insert into ap_patient (patient_id,gender,marital_status,race) values (10012, 'M','M','A');
insert into ap_patient (patient_id,gender,marital_status,race) values (10013, 'M','D','B');
insert into ap_patient (patient_id,gender,marital_status,race) values (10014, 'M','W','A');
insert into ap_patient (patient_id,gender,marital_status,race) values (10015, 'M','M','W');
insert into ap_patient (patient_id,gender,marital_status,race) values (10016, 'M','W','B');
```

In this dataset,
Gender are M (male), F (female)

Marital_status are S (single), M (married), D (divorced), W (Widow or Widower)
Race are A (Asian), B (Black), W (White)

a) Identify columns suitable of creating bitmap indexes, and write bitmaps of each of such bitmap indexes. [10 points]

Submit bitmaps of each distinct value of each of such bitmap indexes

b) Using bitmaps created in (a) above, solve the business question "List patient IDs of those patients who are Female and not Asian, and their marital status is either Single or Married" [20 point]

Submit all intermediate steps of resolving bitmap indexes to achieve the final result, and provide bitmap of the final result. List the patient ids as resulting from final bitmap answer.

c) Write a SQL query that solves business question in (b) above [10 points]

Submit SQL query and its result.

d) Write DDL code for the bitmap indexes identified in (a) above [10 points]

Submit DDL code of bitmap indexes.