

COMP 3005

Assignment #1

Instruction

1. You should do the assignments independently. Copying is not allowed
- 2.
3. You need to download and install Oracle VM for this assignment. Detail about how to install and use Oracle VM can be found in the file **Oracle-VM.doc**.
4. For Parts 2 and 3, you have to test your statements in Oracle VM. If it has syntax error, then you lose 50%.
5. Submit your assignment as a word/PDF file on **culearn** and boldface all integrity constraints in Part 3.

Part 1 Concepts (30 marks)

Explain the following terms:

1. Data **A value that represents known facts with an implicit meaning**
2. Mini World **Some part of the real world for which the database system is developed with its data stored in the database.**
3. Database System **the database and the applications developed for the users on top of DBMS**
4. DBMS **Software to facilitate the creation and maintenance of a computerized database.**
5. DBA **Responsible for acquiring software and hardware resources, controlling its use and monitoring efficiency of operations and authorizing access to the database, for coordinating and monitoring its use**
6. End User **Use the database in day to day basis and don't know how the DB is structured**
7. Business Analyst **analyze vast amounts of business data and real-time data ("Big Data") for better decision making related to planning, advertising, marketing etc**
8. Data Model **specifies how data is structured and operated.**
9. Relational Data Model **all data is represented in terms of tuples (records), grouped into relations (files)**
10. Atomic Value **values that are not divisible**
11. Domain **A domain has three parts: a name, a data-type/format and a set of atomic values.**
12. Key **minimal set of attributes that uniquely identifies that tuples in the relation**
13. Foreign Key **an attribute that references a primary key of the same or different relation**
14. Relation **A relation contains a set of rows (tuples).**
15. Attribute **a column name of the relation indicating the meaning of the data items in that column.**
16. Tuple **a row in the relation. Data elements in each tuple represent certain facts that correspond to a real-world entity or relationship**
17. Entity Integrity Rule **no component of the primary key of a base relation is allowed to be null**
18. Logical Data Independence **The capacity to change the conceptual schema without having to change the external schemas and their associated application programs.**
19. Data Definition Language (DDL) **a language used by the database designers and DBA to specify the conceptual schema of a database. In many DBMSs, the DDL is also used to define internal and external schemas (views).**
20. Data Manipulation Language (DML) **a language to specify insert, delete and update of tuples in the database.**

Part 2 (15 marks)

Create a relation that represents the dependence between objects. The table should have two attributes called *object* and *dependent*, where *object* is the primary key of the relation and *dependent* is a foreign key that references *object*. Then insert three tuples into this table:

1. E1 is dependent on E2

2. E2 is dependent on E3
3. E3 is dependent on E1

Note that this problem is similar to chicken-egg problem but only involves one relation.

What you need to submit is proper DDL and DML statements in sequence that can accomplish this in Oracle.

```
create table part2 (
  object char(10) primary key,
  dependent char(10),
  foreign key (dependent) references part2(object));
```

```
insert into part2 values ('E1', null);
insert into part2 values ('E3', 'E1');
insert into part2 values ('E2', 'E3');
update part2 set dependent='E2' where object='E1';
```

Part 3 (35 marks)

Use SQL Data Definition Language to create the following suppliers-and-parts database. You should properly define primary keys and foreign keys with other 8 integrity constraints of **different kinds**. Submit proper DDL and DML statements with all integrity constraints in **boldface**.

Suppliers

<u>S#</u>	<u>SNAME</u>	<u>STATUS</u>	<u>CITY</u>
S1	Smith	20	London
S2	Jones	30	Paris
S3	Blake	30	Paris
S4	Clark	20	London
S5	Adams	30	Athens

Parts

<u>P#</u>	<u>PNAME</u>	<u>COLOR</u>	<u>WEIGHT</u>	<u>CITY</u>
P1	Nut	Red	12.0	London
P2	Bolt	Green	17.0	Paris
P3	Screw	Blue	17.0	Oslo
P4	Screw	Red	14.0	London
P5	Cam	Blue	12.0	Paris
P6	Cog	Red	19.0	London

SP

<u>S#</u>	<u>P#</u>	<u>QTY</u>
S1	P1	300
S1	P2	200
S1	P3	400
S1	P4	200
S1	P5	100
S1	P6	100
S2	P1	300
S2	P2	400
S3	P2	200
S4	P2	200
S4	P4	300
S4	P5	400

```
CREATE TABLE Suppliers
(S#      char (2),
SNAME   char (8),
STATUS  number (2),
```

```
CITY char (6),
PRIMARY KEY (S#),
CHECK(SNAME in ('Smith', 'Jones', 'Blake', 'Clark', 'Adams')),
CHECK(STATUS between 0 and 99),
CHECK(CITY in ('London', 'Paris', 'Athens', 'Ottawa')));
```

CREATE TABLE Parts

```
(P# char (2),
PNAME char (6),
COLOR char (6),
WEIGHT real,
CITY char (6),
PRIMARY KEY (P#),
CHECK (PNAME in ('Nut', 'Bolt', 'Screw', 'Cam', 'Cog')),
CHECK (COLOR in ('Red', 'Green', 'Blue')),
CHECK (WEIGHT between 0 and 99),
CHECK(CITY in ('London', 'Paris', 'Oslo', 'Rome')));
```

CREATE TABLE SP

```
(S# char (2),
P# char (2),
QTY number (3),
PRIMARY KEY (S#, P#),
FOREIGN KEY (S#) REFERENCES Suppliers (S#) ON DELETE CASCADE,
FOREIGN KEY (P#) REFERENCES Parts (P#) ON DELETE CASCADE,
CHECK (QTY between 0 and 999));
```

```
INSERT INTO Suppliers VALUES ('S1', 'Smith', 20, 'London');
INSERT INTO Suppliers VALUES ('S2', 'Jones', 30, 'Paris');
INSERT INTO Suppliers VALUES ('S3', 'Blake', 30, 'Paris');
INSERT INTO Suppliers VALUES ('S4', 'Clark', 20, 'London');
INSERT INTO Suppliers VALUES ('S5', 'Adams', 30, 'Athens');
INSERT INTO Parts VALUES ('P1', 'Nut', 'Red', 12.0, 'London');
INSERT INTO Parts VALUES ('P2', 'Bolt', 'Green', 17.0, 'Paris');
INSERT INTO Parts VALUES ('P3', 'Screw', 'Blue', 17.0, 'Rome');
INSERT INTO Parts VALUES ('P4', 'Screw', 'Red', 14.0, 'London');
INSERT INTO Parts VALUES ('P5', 'Cam', 'Blue', 12.0, 'Paris');
INSERT INTO Parts VALUES ('P6', 'Cog', 'Red', 19.0, 'London');
INSERT INTO SP VALUES ('S1', 'P1', 300);
INSERT INTO SP VALUES ('S1', 'P2', 200);
INSERT INTO SP VALUES ('S1', 'P3', 400);
INSERT INTO SP VALUES ('S1', 'P4', 200);
INSERT INTO SP VALUES ('S1', 'P5', 100);
INSERT INTO SP VALUES ('S1', 'P6', 100);
INSERT INTO SP VALUES ('S2', 'P1', 300);
INSERT INTO SP VALUES ('S2', 'P2', 400);
INSERT INTO SP VALUES ('S3', 'P2', 200);
INSERT INTO SP VALUES ('S4', 'P2', 200);
INSERT INTO SP VALUES ('S4', 'P4', 300);
INSERT INTO SP VALUES ('S4', 'P5', 400);
```