Justin Cabral

Homework #2

Database Management CS 542

**Problem 1 (Relational Model) [15 Points]**

CREATE TABLE Students

(studentID int **Primary Key**,

name varchar2(50),

address varchar2(100),

gender varchar2(10),

GPA real **Default 0**,

major varcahr2(50) NOT NULL,

minor varchar2(50),

**Constraint genderValue check(gender in (‘Male’,’Female’))**

);

CREATE TABLE Courses

(courseID int **Primary Key**,

title varchar2(50),

credits int

);

CREATE TABLE Register

(studentID int,

courseID int,

registerDate date,

grade int,

**Constraint pk\_cols Primary Key(studentID, courseID, registerDate),**

**Constraint fk\_studentID Forgein Key(studentID) References Students(studentID),**

**Constraint fk\_courseID Foregin Key(courseID) References Courses(courseID),**

);

**Problem 2(Mapping form Entity-Relationship Model to Relational Model) [15 Points]**

AuthorPhone = (ID, Phone)

* Foreign key: AuthorPhone.ID references Author.ID

Author = (address, DoB, ID, name)

Writes = (ID, ISBN)

* Foreign key: Writes.ID references Author.ID
* Foreign key: Writes.ISBN references Book.ISBN

Book = (ISBN, name, type, title, NumberOfPages)

* Foreign key: Book.name references Publisher.name

Publisher = (ISBN, publishedDate)

* Foreign key: Publish.ISBN references Book.ISBN

Contract = (ContractID, name, date, NumberOfBooks, totalPayment, ID)

* Foreign key: Contract.name references Publisher.name
* Foreign key: Contract.ID references Author.ID

Contract Lines = (LineNumber, dueDate, BookType, PartialPayments, ContractID)

* Foreign key: Contract-Lines.ContractID references Contract.ContractID

**Problem 3 (Functional Dependency) [10 Points]**

1.) AB -> A (Reflexive)

2.) AB -> D (Transitivity)

3.) CA -> DA (Augmentation)

4.) C -> DA (Union)

5.) C -> A (Transitivity)

**Problem 4 (Functional Dependency) [10 Points]**

**R(A,B,C,D: AB -> C, C -> D and D -> A**

* AB -> A
* AB -> B
* AB -> D
* AB -> ABCD
* AB is a candidate key for R
* DB is a candidate for key R
* CB is a candidate for key R

**R(A,B,C,D): AB -> C, BC -> D, CD -> A and AD -> B**

* ABD is a candidate key for R
* ADC is a candidate key for R
* BCA is a candidate key for R
* CDB is a candidate key for R

**R(A,B,C,D,E): AB -> C, C -> D, D -> B and D -> E**

* AB -> A (Reflexive)
* AB -> B (Refelxive)
* AB -> C
* AB -> D (Transitivity)
* AB -> E (Transitivity)
* AB is a candidate key for R
* CA is a candidate key for R
* DA is a candidate key for R