CSC 261: Term Project

1. Preamble

Last Modified: April 2nd, 2015
Team: TU06
Team Members

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Master Directory: /home/mliu26/phase2
->db-create-mliu26.sql
->db-create-kcrist.sql
->db-create-yyu27.sql
->db-create-ssun10.sql
->db-create-team-TU06.sql
->db-create-TU06-out.txt

2. Project Domain

The database will store information for a hospital management system. It will contain data specific to every staff member, unique positions, departments, medications, patients, visits, etc. The database can be used to find doctors, patients, review patient medical history, and review employment history. In contrast, the database will not store financial data or data that is not related to health care.

3. Use Cases

a. A patient calls in to schedule an appointment. In the case he knows which doctor he wants, we can use the Doctor ID to schedule an appointment by adding to the Visits table. In addition we will also store the reason for the visit and the date of the visit. In the case the patient doesn't know which doctor he wants, we can find one by querying for a doctor using the DepartmentID in the Staff object and a subquery in the Positions Table for a doctor. In the case this is a new patient, we can make a new tuple for him in the Patients table, if not we can reference the Patients table for his insurance information.
b. A doctor might want to prescribe some medication for the patient. He can access the description of the medication from the medication table to see all medicines that would be appropriate. He can then access the Patient table to see if the patient is allergic and has coverage under his insurance company before selecting one that is appropriate. He can then finally get the properties of the medicine using the med_id.

4. Attributes (M) (Updated)

Author: Mohan Liu{mliu26}
Object: Staff

	Type	Purpose	Example
Staff ID	INT	Unique identification number of each staff member	123456789
First Name	VARCHAR	An employee's first name.	John
Last Name	VARCHAR	An employee's last name	Smith
Gender	INT	An employee's gender.	1
SSN	INT	An employee's social security number.	123456789
Home Phone	INT	An employee's home phone number.	6785674567
Mobile Phone	INT	An employee's mobile phone number.	5858386543
Email	VARCHAR	An employee's email address.	mith@hospital.com
DepartmentID	VARCHAR	An employee's department number	Cardiology
Position_iD	VARCHAR	An employee's department number	2
Position Title	VARCHAR	Title given to a position	Surgeon

Author: Yongke Yu, yyu27
Object: Patients

Patient ID	INT	Identifying number for each Patient	92323021
First Name	VARCHAR	First Name of Client	Jane
Last Name	VARCHAR	Last Name of Client	Doe
Gender	INT	Client's Gender	1
Home Phone	INT	Home Phone of Client	1234567777
Cell Phone	INT	Cell Phone of Client	1324354432
Emergency Contact	INT	Emergency Contact Number	9083219993
Birthday	INT	Birthday of Patient	01021970
Allergies	VARCHAR	Allergies of Patient	Penicillin

Surgical History	VARCHAR	Surgical History of Patient	Tonsil Removal
visit_id	VARCHAR	The reason for the previous visit	Flu
Last_doctor_id	VARCHAR	The Last Doctor Seen	Dr.Smith
Insurance	VARCHAR	Which Insurance Plan they are on	Aetna Student
Date of Last Visit	INT	The date of last visit	0125/2015
Med_id	INT	medication number	13

Author: Siyu Sun(ssun10)
Objects: Diagnosis

ID	Type	Purpose	Example
Diag_id	int	identification of certain symptom	1,2,3,4,etc
Diag_Details	Varchar	Details about symptom	Fever
Severity	int	Severity of the symptom from 1 to 10	5(moderate)
Diag_Date	DATE	Date for the diagnosis	04/12/14
Remark	varchar	Remark for special cases	genetic disease
Patient_ID	int	Which Patient was seen using ID number	12345678
Patient_FName	varchar	Patient's first name by reference	John
Patient_LName	varchar	Patient's last name by reference	Smith
Doctor_ID	int	Which Doctor made the diagnosis using ID number	123456
Med_id	int	medication for certain diagnosis, identifying by id	34562
Second_Diag_Date	DATE	Date for the second appointment for diagnosis	05/02/15

Author: Kiera Crist (kcrist)
Object: Medications

med_id	int	unique identification	13
name	VARCHAR	name of the medication	abc

manf	VARCHAR	name of the manufacturer	abc
contents	VARCHAR	the chemical name of the medicine	abc
effects	VARCHAR	what the medication does to the body	abc
form	VARCHAR	what form (pill, liquid ect) it's taken in	abc
dosage	VARCHAR	what dosages it comes in	abc
side_effects	VARCHAR	what side effects the medication has	abc
schedule	VARCHAR	when to take it	abc
description	VARCHAR	a description of the medication	abc
cost	INT	cost of medication	30

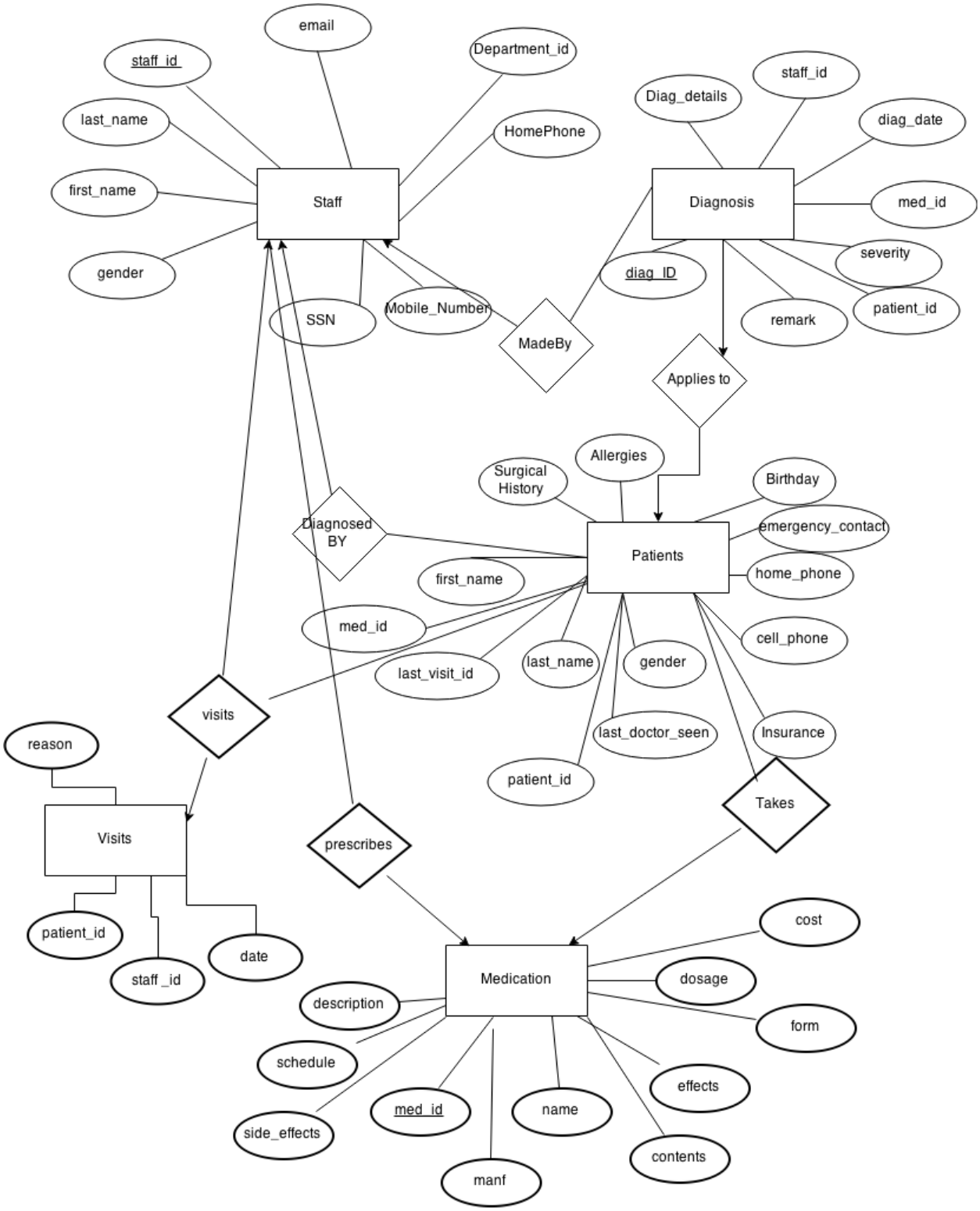
Object : Visits

Patient ID	INT	patient	123
Doctor ID	INT	doctor	1233
Date	INT	date of appointment	02272015
Reason	VARCHAR	reason for appointment	flu

5.Functional Dependencies (M)

{staff_id} → {First Name, Last Name, email, Home Phone, Mobile Phone}
{email} → {First Name, Last Name, SSN, Home Phone, Mobile Phone}
DepartmentID->Position Id

6. **ER Diagram (updated)**



7. Relational Schemata (updated)

Relations:

- Staff(first_name,last_name,staff_id,SSN,mobile_number,homephone,department_id,gender,email)

- Diagnosis(diag_id,staff_id,severity,remark,details,med_id)
- MadeBy(staff_id,diag_id)
- Patients(first_name, last_name, patient_id, birthday, emergency_contact,last_visit_date, last_visit_id, last_doctor, gender, home_phone, cell_phone, insurance, allergies, med_id, surgical history)
- DiagnosedBy(staff_id, last doctor)
- AppliesTo(patient_id, diag_id)
- Takes(patient_id, med_id)
- Prescribes(staff_id, med_id)
- Visits(patient_id, staff_id)

Functional Dependencies:

- in Staff: staff_id->first_name, last_name,mobile_number,homephone,address,SSN,department_id,gender,e mail)
- in Diagnosis: diag_id->staff_id,severity, remark,details,med_id
- in Patient: patient_id ->first_name,last_name,birthday,emergency_contact,last_visit date, last_visit_id, last_doctor, gender, home_phone, cell_phone, insurance, allergies, med_id, surgical_history)
- in Medications med_id ->name, manf, contents,effect, form,dosage, side_effects, schedule, description, cost

8. Proof of Normal Form (need to be updated)

This is in 3NF, because each table is determined only by the candidate key(staff_id,diag_id,patient_id). As you can see in each table, there is a candidate key that all attributes hold relations to (it uniquely identifies a tuple). In addition, it is already in 2NF since all non-prime attributes are dependent on a candidate key and each attribute contains a single value in the domain. So with the combination of candidate key determining all attributes, no redundancies non prime attributes and that it is in 2NF since there are no non prime attributes dependent on any subset of a candidate key, it is in 3NF.

9. (needs the files to generate the output)
db-create-team-TU06.sql:
source /home/yyu27/db-create-yyu27.sql
source /home/ssun10/db-create-ssun10.sql
source /home/kcrist/db-create-kcrist.sql
source /home/mliu26/db-create-mliu26.sql

db-create-*TU06*-output.txt:

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-bash-4.1$ vim db-create-TU06-out.txt

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CREATE TABLE patients(
patient_id INT(10) primary key,
first_name VARCHAR(100),
last_name VARCHAR(100) ,
gender VARCHAR(10),
home_phone INT(20),
cell_phone INT(20),
emerg_cont INT(20),
dob INT(20),
allergies VARCHAR(20) ,
surgical_history VARCHAR(20),
visit_date INT(20) ,
visit_id VARCHAR(20),
lastdoctor_id VARCHAR(20),
insurance VARCHAR(20),
medications VARCHAR(20)
)
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SET SQL_MODE = "NO_AUTO_VALUE_ON_ZERO"
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SET time_zone = "+00:00"
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/*!40101 SET @OLD_CHARACTER_SET_CLIENT=@@CHARACTER_SET_CLIENT
*/
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/*!40101 SET
@OLD_CHARACTER_SET_RESULTS=@@CHARACTER_SET_RESULTS */
--------------

--------------
/*!40101 SET @OLD_COLLATION_CONNECTION=@@COLLATION_CONNECTION
*/
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/*!40101 SET NAMES utf8 */
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