**Formal Specification**

**Schema**

Employee ( eID: integer, ename: string, sin : string, loginID : string, password : string)

Doctor ( eID: integer, ename: string, sin : string, loginID : string, password : string,

licence: string, quaflication: string)

Appointment ( eID: integer, time: string, date: string, fee: real)

Patient( pID: integer, pname: string, address: string, phonenumber: string, email: string, carecardnum: string)

Insurance( type: string, cname: string)

Covered\_by( type: string, cname: string, pID: integer, cost: integer)

Diagnose ( eID: integer, pID: integer, prescription: string)

Payment (eID: integer, time: string, date: string, pID: integer, type: string)

Schedule( e.eID: integer, a.eID: integer, pID: integer, time: string, date: string)

have\_fHistory(pID: integer, pname: string, fname: string, condition: string, relation: string)

contains\_pHistory(pID : integer, pname : string, date: string, condition: string, medication : string)

has\_MedicalRecords(pID: integer, pname: string, allergies: string, emerContacts: string)

**SQL DDL for tables**

CREATE TABLE Employee (

eID int,

eName char(50),

sin char(9),

loginID char(20),

password char(50),

PRIMARY KEY (eID));

CREATE TABLE Doctor (

eID int,

eName char(50),

sin char(9),

loginID char(20),

password char(50),

qualification char(30),

license char(6),

PRIMARY KEY (eID));

CREATE TABLE Patient(

pID: integer,

pName char(50),

address char(40),

phone char(10),

email char(30),

carecard char(10),

PRIMARY KEY (pID));

CREATE TABLE Appointment (

eID int,

aDate date,

time timestamp,

fee int,

PRIMARY KEY (eID, aDate, time),

FOREIGN KEY (eID) REFERENCES Doctor);

CREATE TABLE Insurance (

type char(10),

cName char(20),

PRIMARY KEY (type, cname));

CREATE TABLE CoveredBy (

pID int,

type char(10),

cName char(50),

cost integer,

PRIMARY KEY( pID, type, cName),

FOREIGN KEY (pID) REFERENCES Patient);

CREATE TABLE Diagnose (

eID int,

pID int,

prescription char(50),

PRIMARY KEY (eID, pID),

FOREIGN KEY (eID) REFERENCES Doctor,

FOREIGN KEY (pID) REFERENCES Patient);

CREATE TABLE Payment (

eID int,

time timestamp,

aDate date,

pID int,

type char(10),

PRIMARY KEY (eID, time, aDate, pID),

FOREIGN KEY (eID, aDate, time) REFERENCE Appointment,

FOREIGN KEY (pID) REFERENCE Patient);

CREATE TABLE Schedule (

e\_eID int,

a\_eID int,

pID int,

time timestamp,

sDate date,

PRIMARY KEY (e\_eID, a\_eID, pID, time, sDate),

FOREIGN KEY (e\_eID) REFERENCES Doctor,

FOREIGN KEY (a\_eID, sDate, time) REFERENCES Appointment,

FOREIGN KEY (pID) REFERENCES Patient);

CREATE TABLE has\_fHistory(

pID int,

pName char(50),

fName char(50),

relation char(10),

condition char(20),

PRIMARY KEY (pID, pName, fName, condition),

FORIEGN KEY (pID, pName) REFERENCES has\_MedicalRecords)

CREATE TABLE contains\_pHistory(

pID int,

pname char(50),

pDate date,

condition char(20),

medication char(50),

PRIMARY KEY (pID, pname, pDate, condition),

FORIEGN KEY (pID, pname) REFERENCES has\_MedicalRecords)

CREATE TABLE has\_MedicalRecords(

pID int,

pName char(50),

allergies char(30),

emerContacts char(50),

PRIMARY KEY (pID, pname),

FOREIGN KEY (pID) REFERENCES Patient)

**Tuples**

Employee

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| eID | ename | sin | loginID | password |
| 2283 | Sam Simon | 212 998 768 | jsmith | 5f4dcc3b5aa765d61d8327deb882cf99 |
| 6122 | Julie Kavner | 151 280 582 | jkavner | 25a1669723f671c8254ca1760313b2b5 |
| 1121 | Hank Azaria | 110 238 914 | hazaria | b5884fb8c8785eae504f2816f0451e42 |
| 8862 | Nancy Cartwright | 976 229 178 | ncartwright | 5b13b76226599ce87037f9b4ca32be22 |
| 4605 | Danny Elfman | 197 287 889 | delfman | 5d907853a9617cfd55fb62eae803595b |

Doctor

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| eID | ename | sin | loginID | password | qualification | licence |
| 8923 | Bryan Cranston | 186 719 990 | bcranston | fed1f37d40a3e8a0103bf5e95875a82f | Doctor of Medicine | 228192 |
| 1345 | Aaron Paul | 972 163 229 | apaul | 316928e0d260556eaccb6627f2ed657b | Doctor of Osteopathic Medicine | 550971 |
| 7074 | RJ Mitte | 585 228 090 | rmitte | 0fd73b3614ede6a8536f1a3fb191abf2 | Bachelor of Medicine | 518762 |
| 5515 | Dean Norris | 558 859 100 | dnorris | 99754106633f94d350db34d548d6091a | Bachelor of Surgery | 119271 |
| 4528 | Vince Gilligan | 111 097 889 | vgilligan | 90434ae19345b6fd7a2e96b25186bd28 | Bachelor of Neurology | 529663 |

Appointment

|  |  |  |  |
| --- | --- | --- | --- |
| eID | time | date | fee |
| 8923 | 3:00 PM | Sep. 30th, 2013 | 135 |
| 1345 | 11:00 AM | Oct. 14th, 2013 | 150 |
| 7074 | 9:00 AM | Oct. 25th, 2013 | 85 |
| 5515 | 4:00 PM | Nov. 7th, 2013 | 60 |
| 1345 | 2:00 PM | Nov. 23th, 2013 | 150 |

Patient

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| pID | pname | address | phone  number | email | carecardnum |
| 5113 | Olene Kay | 34251 Abbott St. | 604 435 4565 | okay@gmail.com | 6748 086 656 |
| 1239 | Hans Difalco | 5122 McRae Ave. | 604 959 3048 | hans33@hotmail.com | 6087 456 254 |
| 5543 | Terrie Pittsley | 8221 Oak St. | 778 034 5943 | tpittsley@live.ca | 2913 393 323 |
| 6357 | Inez Hollis | 1677 Park Dr. | 778 495 2031 | inezhollis@hotmail.com | 4101 243 637 |
| 3543 | Wilfred Iorio | 1264 Dunbar St. | 778 192 4825 | willioro@gmail.com | 8365 926 321 |

Insurance

|  |  |
| --- | --- |
| type | cname |
| full | Manulife |
| half | Manulife |
| full | Blue Cross |
| full | Standard Life |
| half | Standard Life |

Covered\_by

|  |  |  |  |
| --- | --- | --- | --- |
| type | cname | pID | cost |
| full | Manulife | 5113 | 135 |
| half | Manulife | 1239 | 75 |
| full | Blue Cross | 5543 | 85 |
| full | Standard Life | 6357 | 60 |
| half | Standard Life | 3543 | 75 |

Diagnose

|  |  |  |
| --- | --- | --- |
| eID | pID | prescription |
| 8923 | 5113 | Amoxicillin 250mg x 7 tablets |
| 1345 | 1239 | Acetaminophin 300mg x 30 tablets |
| 7074 | 5543 | Vitamin D 500mg x 30 tablets |
| 5515 | 6357 | Iron 10mg x 30 tablets |
| 1345 | 3543 | Vicodin 25mg x 10 tablets |

Payment

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| eID | time | date | pID | type |
| 8923 | 3:00 PM | Sep. 30th, 2013 | 5113 | CreditCard |
| 1345 | 11:00 AM | Oct. 14th, 2013 | 1239 | DebitCard |
| 7074 | 9:30 AM | Oct. 25th, 2013 | 5543 | DebitCard |
| 5515 | 4:00 PM | Nov. 7th, 2013 | 6357 | Cash |
| 1345 | 2:00 PM | Nov. 23th, 2013 | 3543 | CreditCard |

Schedule

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| e.eID | a.eID | pID | time | date |
| 8923 | 2283 | 5113 | 3:00 PM | Sep. 30th, 2013 |
| 1345 | 6122 | 1239 | 11:00 AM | Oct. 14th, 2013 |
| 7074 | 1121 | 5543 | 9:30 AM | Oct. 25th, 2013 |
| 5515 | 8862 | 6357 | 4:00 PM | Nov. 7th, 2013 |
| 1345 | 4605 | 3543 | 2:00 PM | Nov. 23th, 2013 |

have\_fHistory

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| pID | pname | fname | relation | condition |
| 1239 | Hans Difalco | Joseph Difalco | Father | Color Blindness |
| 1239 | Hans Difalco | Mary Difalco | Mother | Cystic Fibrosis |
| 1239 | Hans Difalco | Alfred Difalco | Uncle | Color Blindness |
| 1239 | Hans Difalco | Tom Difalco | Brother | Color Blindness |
| 1239 | Hans Difalco | Sally Difalco | Sister | Haemophilia |

contains\_pHistory

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| pID | pname | date | condition | medication |
| 5133 | Olene Kay | Mar. 3, 2011 | Mono | Ibuprofen 200mg x 10 tablets,  Prednisone 40mg x 10 tablets |
| 5133 | Olene Kay | Sep. 20, 2012 | Flu | Acetaminophin 150mg x 10 tablets |
| 1239 | Hans Difalco | Feb. 13, 2013 | Carpal Tunnel | Ibuprofen 300mg x 30 tablets |
| 1239 | Hans Difalco | Mar. 24, 2013 | Flu | Acetaminophin 150mg x 10 tablets |
| 3543 | Wilfred Iorio | Dec 11, 2010 | Ankle Sprain | Acetaminophin 300mg x 30 tablets |

has\_MedicalRecords

|  |  |  |  |
| --- | --- | --- | --- |
| pID | pname | allergies | emer  Contacts |
| 5113 | Olene Kay | penicillin | Maggie Kay : 604-333-1234 |
| 1239 | Hans Difalco | N/A | Ben Difalco :  604-123-5678 |
| 5543 | Terrie Pittsley | avocado,mango | Jess Diagonal :  778-555-4312 |
| 6357 | Inez Hollis | penicillin | Mario Hollis :  604-676-8899 |
| 3543 | Wilfred Iorio | bee venom | Daisy Iorio :  778-321-4565 |