**/\*DDL\*/**

DROP TABLE IF EXISTS Patient CASCADE;

DROP TABLE IF EXISTS Sample CASCADE;

DROP TABLE IF EXISTS Company CASCADE;

DROP TABLE IF EXISTS Result CASCADE;

DROP TABLE IF EXISTS Doctor CASCADE;

DROP TABLE IF EXISTS Sequenced\_by CASCADE;

DROP TABLE IF EXISTS provided\_by CASCADE;

DROP TABLE IF EXISTS analyzed\_by CASCADE;

DROP TABLE IF EXISTS Diagnosed\_by CASCADE;

CREATE TABLE Patient

(pID varchar (50) PRIMARY KEY,

pFirst varchar (50),

pLast varchar (50),

pDOB date,

pAddress varchar (50),

pEmail varchar (50),

pPhone varchar (50));

CREATE TABLE Sample

(sID varchar (50) PRIMARY KEY,

collection\_date date,

sType varchar (50),

pID varchar (50),

FOREIGN KEY (pID) REFERENCES Patient(pID));

CREATE TABLE Company

(cID varchar (50) PRIMARY KEY,

cName varchar (50),

cEmail varchar (50),

cPhone varchar (50));

CREATE TABLE Result

(rID varchar (50) PRIMARY KEY,

seqs varchar (100),

variant varchar (50),

drug varchar (50),

mlevel varchar (50),

sID varchar(50),

FOREIGN KEY (sID) REFERENCES Sample(sID)

);

CREATE TABLE Doctor

(dID varchar (50) PRIMARY KEY,

dFirst varchar (50),

dLast varchar (50),

dSpecialty varchar (50));

CREATE TABLE Sequenced\_by

(cID varchar (50),

sID varchar (50),

sequence\_date date,

PRIMARY KEY(cID,sID),

FOREIGN KEY (cID) REFERENCES Company(cID),

FOREIGN KEY (sID) REFERENCES Sample(sID)

);

CREATE TABLE Provided\_by

(cID varchar (50),

rID varchar (50) PRIMARY KEY,

ret\_date date,

FOREIGN KEY (cID) REFERENCES Company(cID),

FOREIGN KEY (rID) REFERENCES Result(rID)

);

CREATE TABLE Analyzed\_by

(rID varchar (50),

dID varchar (50),

dosage numeric,

PRIMARY KEY(rID,dID),

FOREIGN KEY (rID) REFERENCES Result(rID),

FOREIGN KEY (dID) REFERENCES Doctor(dID)

);

CREATE TABLE Diagnosed\_by

(dID varchar (50),

pID varchar (50),

diag\_date date,

rID varchar(50),

diagnosis varchar(50),

PRIMARY KEY(dID,pID),

FOREIGN KEY (dID) REFERENCES Doctor(dID),

FOREIGN KEY (pID) REFERENCES Patient(pID),

FOREIGN KEY (rID) REFERENCES Result(rID)

);

**/\*DML\*/**

INSERT INTO Patient(pID,pFirst,pLast,pDOB,pAddress,pEmail,pPhone)

VALUES

('P001','Bradley','Ostberg','1978-05-23','1433 Cherry Street, Denver, Colorado','bostberg@gmail.com','720-123-4567'),

('P002','Shirlee','Mould','1986-01-14','789 Elmwood Avenue, Austin, Texas','smould@yahoo.com','512-789-0123'),

('P003','Shania','Graves','1992-08-07','5279 Maple Drive, Seattle, Washington','sgraves@gmail.com','206-555-6789'),

('P004','Wisteria','Poole','1972-10-11','2218 Oak Street, New Orleans, Louisiana','wpoole@hotmail.com','504-234-5678'),

('P005','Sasha','Law','1999-03-29','4002 Pine Avenue, Sacramento, California','slaw@gmail.com','916-345-6789'),

('P006','Tahnee','Harlan','1983-06-09','9026 Cedar Lane, Indianapolis, Indiana','tharlan@yahoo.com','317-456-7890'),

('P007','Kae','Andrews','1979-12-01','6890 Birchwood Drive, Atlanta, Georgia','kandrews@yahoo.com','404-567-8901'),

('P008','Dora','Peyton','1996-04-12','1753 Spruce Street, Portland, Oregon','dpeyton@gmail.com','503-678-9012'),

('P009','Orrell','Scrivener','1988-09-03','3387 Aspen Court, Baltimore, Maryland','oscrivener@gmail.com','410-789-0123'),

('P010','Dorinda','Law','1976-11-25','620 Poplar Road, Kansas City, Missouri','dlaw@hotmail.com','816-234-5678')

;

INSERT INTO Sample(sID,collection\_date,sType,pID)

VALUES

('S001','2016-05-02','oral','P001'),

('S002','2016-05-02','blood','P001'),

('S003','2016-05-18','blood','P002'),

('S004','2019-08-21','urine','P003'),

('S005','2017-11-20','oral','P004'),

('S006','2017-12-13','blood','P004'),

('S007','2020-06-04','oral','P005'),

('S008','2020-03-02','oral','P006'),

('S009','2018-07-23','urine','P007'),

('S010','2018-07-23','blood','P007'),

('S011','2020-06-08','oral','P008'),

('S012','2020-07-19','oral','P009'),

('S013','2020-10-12','oral','P003'),

('S014','2021-01-06','oral','P010'),

('S015','2020-11-12','oral','P010')

;

INSERT INTO Result(rID,seqs,Variant,drug,mlevel,sID) VALUES

('R001','ATGGTCTTACTTGGTCTTGCAGAAGCAGGGTATGGAACAGTCCCTTTGTCTTCC','CYP2C19\*1/\*17','Clopidogrel','rapid','S001'),

('R002','GTCCTGCTCGCGCGCTCGCGCGCGCGCGCGCGCTGCGCGCTGCGCGCGCGCGC','CYP2C19\*1/\*17','Voriconazole','rapid','S002'),

('R003','CGGAGTGACACGTCTTGAACTGTGATGTTGTGTCTTCAGTTTCCGAGAAGGGC','CYP2C19\*1/\*1','Voriconazole','normal','S003'),

('R004','TGCTGCCAACTTGGAGGCGCAGCGCGAGCGCGCGCGCGCGCGCGCGCGCGCGC','CYP2B6\*1/\*4','Efavirenz','rapid','S004'),

('R005','GAGGGGGATGTTGGAGCTGCGGCGTTGCCTCTGGGGTTCTAGGTGTTTTGCTG','CYP2B6\*6/\*6','Efavirenz','poor','S005'),

('R006','GGAGCGTGCGCTTGCGCGCGAGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGC','CYP2C19\*17/\*17','Celecoxib','ultrarapid','S006'),

('R007','ACGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCG','CYP2C19\*17/\*17','Voriconazole','ultrarapid','S007'),

('R008','GATTTGGTTGGGGAGTTGCTGAGGCAGAAGGCTGGCCAGTGTTCTCTGATTTA','CYP2C19\*2/\*2','Clopidogrel','poor','S008'),

('R009','GCTCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCG','CYP2C19\*1/\*17','Voriconazole','rapid','S009'),

('R010','TGGTACGTGTGAGTCCAGGGTCCAGGATAGGCGTCTCCATCCCTGTGATGGG','CYP2C19\*17/\*17','Clopidogrel','ultrarapid','S010'),

('R011','ATCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGC','CYP2B6\*1/\*4','Efavirenz','rapid','S011'),

('R012','CGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGC','CYP2B6\*1/\*1','Efavirenz','normal','S012'),

('R013','GGAGCTTTGGGAGGAAGCCAGGAAGAGTGCTCAGAGCTGGGAGGTGTTGTGC','CYP2C19\*1/\*17','Clopidogrel','rapid','S013'),

('R014','CTCTCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGCGC','CYP2C19\*1/\*1','Clopidogrel','normal','S014'),

('R015','GTGAGTGTGAGTCTGGAGAGGATGAGGACAGGGAAGAGGGACGGGAGGGAGC','CYP2C19\*1/\*1','Voriconazole','normal','S015')

;

INSERT INTO Company(cID,cName,cEmail,cPhone) VALUES

('C001','Medtronic','info@medtronic.com','692-245-0958'),

('C002','Novartis','contact.center@novartis.com','789-574-8531'),

('C003','Max Health','info.mh@max.com','727-382-0333')

;

INSERT INTO Sequenced\_By(cID,sID,sequence\_date) VALUES

('C001','S001','2016-05-14'),

('C001','S002','2016-05-14'),

('C001','S003','2016-06-01'),

('C002','S004','2019-08-30'),

('C002','S005','2017-12-07'),

('C001','S006','2017-12-29'),

('C003','S007','2020-06-21'),

('C003','S008','2020-03-22'),

('C001','S009','2018-08-03'),

('C001','S010','2018-08-03'),

('C002','S011','2020-06-27'),

('C002','S012','2020-07-29'),

('C001','S013','2020-10-25'),

('C003','S014','2021-01-17'),

('C003','S015','2020-11-30')

;

INSERT INTO provided\_by(cID,rID, ret\_date) VALUES

('C001','R001','2016-05-16'),

('C001','R002','2016-05-16'),

('C001','R003','2016-06-04'),

('C002','R004','2019-09-02'),

('C002','R005','2017-12-10'),

('C001','R006','2018-01-02'),

('C003','R007','2020-06-23'),

('C003','R008','2020-03-25'),

('C001','R009','2018-08-05'),

('C001','R010','2018-08-05'),

('C002','R011','2020-06-29'),

('C002','R012','2020-08-01'),

('C001','R013','2020-10-27'),

('C003','R014','2021-01-19'),

('C003','R015','2020-12-03')

;

INSERT INTO Doctor(dID,dFirst,dLast,dSpecialty) VALUES

('D001','Vincent','Bird','Internal Medicine'),

('D002','Andrea','Staford','Family Medicine'),

('D003','Dennis','Franklin','Pathology'),

('D004','Marc','Ruiz','Cardiology'),

('D005','Halima','Kim','Medical Genetics'),

('D006','Jackson','Cannon','Family Medicine'),

('D007','Isaiah','Huffman','Internal Medicine')

;

INSERT INTO analyzed\_by(rID,dID,dosage) VALUES

('R001', 'D003', '300'),

('R002', 'D004', '100'),

('R003', 'D005', '75'),

('R004', 'D001', '600'),

('R005', 'D005', NULL),

('R006', 'D006', '65'),

('R007', 'D004', '65'),

('R008', 'D007', NULL),

('R009', 'D007', '350'),

('R010', 'D003', '65'),

('R011', 'D006', '50'),

('R012', 'D003', '200'),

('R013', 'D002', '65'),

('R014', 'D003', '75'),

('R015', 'D001', '350')

;

INSERT INTO Diagnosed\_by(dID,pID,diag\_date,rID,diagnosis) VALUES

('D003','P001','2016-05-20','R001','Peripheral vascular disease'),

('D004','P001','2016-05-20','R002','Aspergillosis'),

('D005','P002','2016-06-07','R003','Candida esophagitis'),

('D001','P003','2019-09-06','R004','HIV'),

('D005','P004','2018-01-05','R005','HIV'),

('D006','P004','2018-01-05','R006','Osteoarthritis'),

('D004','P005','2020-06-26','R007','Pyelonephritis'),

('D007','P006','2020-03-29','R008','Angina'),

('D007','P007','2018-08-08','R009','Gastroenteritis'),

('D003','P007','2018-08-08','R010','Coronary artery disease'),

('D006','P008','2020-07-03','R011','HIV'),

('D003','P009','2020-08-04','R012','HIV'),

('D002','P001','2020-11-01','R013','Angina'),

('D003','P010','2021-01-22','R014','Myocardial infarction'),

('D001','P010','2020-12-05','R015','Cystitis')

;

/\*DQL\*/

**/\*High Metabolizing Patients\*/**

SELECT Patient.pID,pFirst,pLast,pPhone,count(drug) as drugCount

FROM Patient,Sample,Result

WHERE Patient.pID = Sample.pID AND

Sample.sID = Result.sID AND

(mlevel = 'rapid' OR mlevel = 'ultrarapid')

GROUP BY Patient.pID

ORDER BY count(drug) DESC

;

**/\*maxDrugDosages\*/**

SELECT Patient.pID, Patient.pFirst, Patient.pLast, Result.drug, max(Analyzed\_by.dosage) as maxDosage

FROM Patient, Sample, Result, Analyzed\_by

WHERE Patient.pID = Sample.pID AND

Sample.sID = Result.sID AND

Result.rID = Analyzed\_by.rID AND

(drug,dosage) IN (SELECT drug, max(dosage)

FROM Analyzed\_by,Result

WHERE Result.rID = Analyzed\_by.rID

GROUP BY drug)

GROUP BY Patient.pID, Result.drug

ORDER BY Patient.pID ASC

;

**/\*doctorUnqiueVariants\*/**

SELECT d.dID, d.dFirst, d.dLast, d.dSpecialty, COUNT(DISTINCT r.variant) AS variant\_count

FROM doctor d, Analyzed\_by A, Result r

WHERE d.dID = A.dID

AND r.rID = A.rID

GROUP BY d.dID

HAVING COUNT(DISTINCT r.variant) >= 2

ORDER BY variant\_count DESC;