Group Project Final Document
The Healthcare Clinic Database

- Project Part 1 – 3
- Team Number: #5
- Team Members: Mary Le, Elle Nguyen, Anthony Bockarie Jr, Mihir Patel
- Team Database Name: The Healthcare Clinic Database

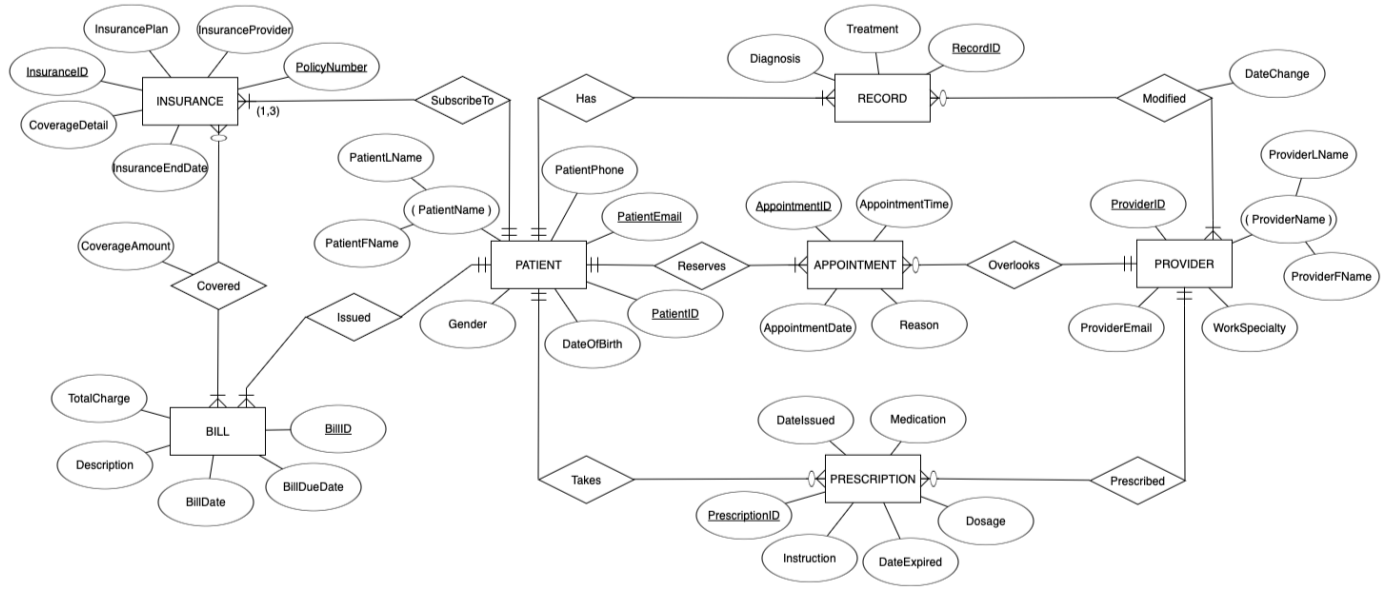
Part 1:

Database Requirements Set:

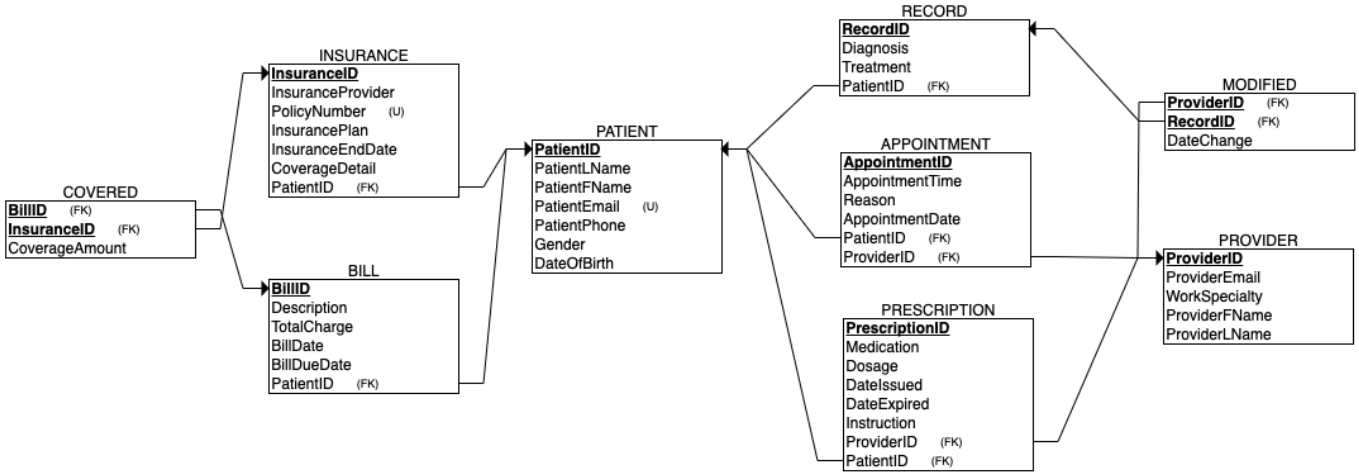
- The Healthcare Clinic allows visiting patients to consult its healthcare providers. The Healthcare Clinic will track patients' profiles, Electrical Medical Records (EMR), healthcare providers, medical prescriptions, insurance information, appointments, and bills.
- For each patient, the database will keep track of a unique ID, the full name composed of the first name and the last name, phone number, birthdate, gender, and unique contact email address.
- For each Electrical Medical Record (EMR), the database will keep track of a unique ID, diagnosis, and received treatment.
- For each appointment, the database will keep track of a unique ID, time, date, and reason.
- For each healthcare provider, the database will keep track of a unique ID, the full name composed of the first name and the last name, contact email address, and work specialty.
- For each prescription, the database will keep track of a unique ID, instruction, dosage, issuance date, expiration date, and medication.
- For each insurance, the database will keep track of a unique ID, provider, unique policy number, plan, expiration date, and coverage details.
- For each bill, the database will keep track of a unique ID, issuance date, due date, description, and total charged amount.
- Each patient must have at least one medical record and can have many medical records. Each medical record belongs to exactly one patient.
- Each appointment must be overlooked by exactly one healthcare provider. Each healthcare provider can overlook many appointments but does not have to overlook any appointments.
- Each appointment must be reserved by exactly one patient. Each patient must reserve at least one appointment and can reserve many appointments.

- Each patient can take many prescriptions but does not have to take any prescription. Each prescription must be taken by exactly one patient.
- Each patient must subscribe to at least 1 insurance and can subscribe to at most 3 insurances. Each insurance must be subscribed to by exactly one patient.
- Each patient must be issued at least one bill and can be issued many bills. Each bill must be issued to exactly one patient.
- Each healthcare provider can modify many medical records but does not have to modify any records. Each medical record must be modified by at least one healthcare provider and can be modified by many providers because a patient may undergo various treatments or consultations across multiple visits, which necessitates that several providers may need to modify these records to keep track of evolving diagnoses and treatments.
- For each medical record that a particular healthcare provider modifies, the database keeps track of the date that the changes are made.
- Each healthcare provider can prescribe many medical prescriptions but does not have to prescribe any medications. Each prescription must be prescribed by exactly one healthcare provider.
- Each bill can be covered by many insurances but does not have to be covered by any insurance. Each insurance must cover at least one bill and can cover many bills.
- For each bill that a particular insurance covers, the database keeps track of the coverage amount.

ER Diagram - The Healthcare Clinic Database



Part 2: Relational Schema – The Healthcare Clinic Database



Part 3: SQL Statements

```
--Create tables
CREATE TABLE PATIENT
(
   PatientID      NUMBER         NOT NULL    PRIMARY KEY,
   PatientLName    VARCHAR2(50)    NOT NULL,
   PatientFName    VARCHAR2(50)    NOT NULL,
   PatientEmail    VARCHAR2(100)   NOT NULL    UNIQUE,
   PatientPhone    VARCHAR2(20)    NOT NULL,
   Gender         VARCHAR2(10)    NOT NULL,
   DateOfBirth     DATE           NOT NULL
);

CREATE TABLE INSURANCE
(
   InsuranceID        NUMBER         NOT NULL    PRIMARY KEY,
   InsuranceProvider   VARCHAR2(100)   NOT NULL,
   PolicyNumber       VARCHAR2(50)    NOT NULL    UNIQUE,
   InsurancePlan      VARCHAR2(100)   NOT NULL,
   InsuranceEndDate    DATE           NOT NULL,
   CoverageDetail      VARCHAR2(255)   NOT NULL,
   PatientID          NUMBER         NOT NULL,
   FOREIGN KEY (PatientID) REFERENCES PATIENT (PatientID)
);

CREATE TABLE PROVIDER
(
   ProviderID     NUMBER         NOT NULL    PRIMARY KEY,
   ProviderEmail   VARCHAR2(100)   NOT NULL,
   WorkSpecialty   VARCHAR2(100)   NOT NULL,
   ProviderFName   VARCHAR2(50)    NOT NULL,
   ProviderLName   VARCHAR2(50)    NOT NULL
);

CREATE TABLE RECORD
(
   RecordID    NUMBER         NOT NULL    PRIMARY KEY,
   Diagnosis   VARCHAR2(255)   NOT NULL,
   Treatment   VARCHAR2(255)   NOT NULL,
   PatientID   NUMBER         NOT NULL,
   FOREIGN KEY (PatientID) REFERENCES PATIENT (PatientID)
);

CREATE TABLE PRESCRIPTION
(
   PrescriptionID     NUMBER         NOT NULL    PRIMARY KEY,
   Medication         VARCHAR2(150)   NOT NULL,
```

```
    Dosage              VARCHAR2(50)    NOT NULL,
    DateIssued          DATE            NOT NULL,
    DateExpired         DATE            NOT NULL,
    Instruction         VARCHAR2(255)   NOT NULL,
    ProviderID          NUMBER          NOT NULL,
    PatientID           NUMBER          NOT NULL,
    FOREIGN KEY (ProviderID) REFERENCES PROVIDER (ProviderID),
    FOREIGN KEY (PatientID) REFERENCES PATIENT (PatientID)
);

CREATE TABLE BILL
(
    BillID          NUMBER          NOT NULL    PRIMARY KEY,
    Description     VARCHAR2(255)   NOT NULL,
    TotalCharge     NUMBER(10,2)    NOT NULL,
    BillDate        DATE            NOT NULL,
    BillDueDate     DATE            NOT NULL,
    PatientID       NUMBER          NOT NULL,
    FOREIGN KEY (PatientID) REFERENCES PATIENT (PatientID)
);

CREATE TABLE APPOINTMENT
(
    AppointmentID       NUMBER          NOT NULL    PRIMARY KEY,
    AppointmentTime     TIMESTAMP       NOT NULL,
    AppointmentDate     DATE            NOT NULL,
    Reason              VARCHAR2(255)   NOT NULL,
    PatientID           NUMBER          NOT NULL,
    ProviderID          NUMBER          NOT NULL,
    FOREIGN KEY (PatientID) REFERENCES PATIENT (PatientID),
    FOREIGN KEY (ProviderID) REFERENCES PROVIDER (ProviderID)
);

CREATE TABLE MODIFIED
(
    ProviderID    NUMBER    NOT NULL,
    RecordID      NUMBER    NOT NULL,
    DateChange    DATE      NOT NULL,
    PRIMARY KEY (ProviderID, RecordID),
    FOREIGN KEY (ProviderID) REFERENCES PROVIDER (ProviderID),
    FOREIGN KEY (RecordID) REFERENCES RECORD (RecordID)
);

CREATE TABLE COVERED
(
    BillID              NUMBER          NOT NULL,
    InsuranceID         NUMBER          NOT NULL,
    CoverageAmount      NUMBER(10,2)    NOT NULL,
```

```
    PRIMARY KEY (BillID, InsuranceID),
    FOREIGN KEY (BillID) REFERENCES BILL (BillID),
    FOREIGN KEY (InsuranceID) REFERENCES INSURANCE (InsuranceID)
);


--Insert at least 2 rows
--PATIENT table
INSERT INTO PATIENT (PatientID, PatientLName, PatientFName, PatientEmail, PatientPhone,
Gender, DateOfBirth) VALUES
(1, 'Smith', 'John', 'john.smith@google.com', '123-456-7890', 'Male', TO_DATE('1990-01-01',
'YYYY-MM-DD'));
INSERT INTO PATIENT (PatientID, PatientLName, PatientFName, PatientEmail, PatientPhone,
Gender, DateOfBirth) VALUES
(2, 'Johnson', 'Emily', 'emily.johnson@yahoo.com', '987-654-3210', 'Female', TO_DATE('1985-
05-15', 'YYYY-MM-DD'));
INSERT INTO PATIENT (PatientID, PatientLName, PatientFName, PatientEmail, PatientPhone,
Gender, DateOfBirth) VALUES
(3, 'Williams', 'Michael', 'michael.williams@hotmail.com', '575-565-5565', 'Male',
TO_DATE('1978-09-20', 'YYYY-MM-DD'));

--INSURANCE table
INSERT INTO INSURANCE (InsuranceID, InsuranceProvider, PolicyNumber, InsurancePlan,
InsuranceEndDate, CoverageDetail, PatientID) VALUES
(1, 'ABC Insurance', 123456, 'Standard Plan', TO_DATE('2025-12-31', 'YYYY-MM-DD'), 'Basic
Coverage', 1);
INSERT INTO INSURANCE (InsuranceID, InsuranceProvider, PolicyNumber, InsurancePlan,
InsuranceEndDate, CoverageDetail, PatientID) VALUES
(2, 'XYZ Insurance', 987654, 'Premium Plan', TO_DATE('2026-06-30', 'YYYY-MM-DD'),
'Comprehensive Coverage', 2);
INSERT INTO INSURANCE (InsuranceID, InsuranceProvider, PolicyNumber, InsurancePlan,
InsuranceEndDate, CoverageDetail, PatientID) VALUES
(3, 'DEF Insurance', 456789, 'Basic Plan', TO_DATE('2025-10-15', 'YYYY-MM-DD'), 'Limited
Coverage', 3);

--PROVIDER table
INSERT INTO PROVIDER (ProviderID, ProviderEmail, WorkSpecialty, ProviderFName,
ProviderLName) VALUES
(1, 'alice.johnson@clinic.com', 'General Medicine', 'Alice', 'Johnson');
INSERT INTO PROVIDER (ProviderID, ProviderEmail, WorkSpecialty, ProviderFName,
ProviderLName) VALUES
(2, 'david.smith@clinic.com', 'Pediatrics', 'David', 'Smith');
INSERT INTO PROVIDER (ProviderID, ProviderEmail, WorkSpecialty, ProviderFName,
ProviderLName) VALUES
(3, 'sarah.brown@clinic.com', 'Dermatology', 'Sarah', 'Brown');

--RECORD table
INSERT INTO RECORD (RecordID, Diagnosis, Treatment, PatientID) VALUES
```

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(1, 'Common Cold', 'Rest and hydration', 1);
INSERT INTO RECORD (RecordID, Diagnosis, Treatment, PatientID) VALUES
(2, 'Fractured Arm', 'Cast applied', 2);
INSERT INTO RECORD (RecordID, Diagnosis, Treatment, PatientID) VALUES
(3, 'Skin Rash', 'Prescribed cream', 3);

--PRESCRIPTION table
INSERT INTO PRESCRIPTION (PrescriptionID, Medication, Dosage, DateIssued,
DateExpired, Instruction, ProviderID, PatientID) VALUES
(1, 'Paracetamol', '500mg', TO_DATE('2024-04-21', 'YYYY-MM-DD'), TO_DATE('2024-05-21',
'YYYY-MM-DD'), 'Take as needed', 1, 1);
INSERT INTO PRESCRIPTION (PrescriptionID, Medication, Dosage, DateIssued,
DateExpired, Instruction, ProviderID, PatientID) VALUES
(2, 'Amoxicillin', '250mg', TO_DATE('2024-04-21', 'YYYY-MM-DD'), TO_DATE('2024-05-21',
'YYYY-MM-DD'), 'Take twice a day', 2, 2);
INSERT INTO PRESCRIPTION (PrescriptionID, Medication, Dosage, DateIssued,
DateExpired, Instruction, ProviderID, PatientID) VALUES
(3, 'Hydrocortisone Cream', 'Apply topically', TO_DATE('2024-04-21', 'YYYY-MM-DD'),
TO_DATE('2024-05-21', 'YYYY-MM-DD'), 'Apply on affected area', 3, 3);

--BILL table
INSERT INTO BILL (BillID, Description, TotalCharge, BillDate, BillDueDate, PatientID)
VALUES
(1, 'Consultation Fee', 100.00, TO_DATE('2024-04-21', 'YYYY-MM-DD'), TO_DATE('2024-05-
21', 'YYYY-MM-DD'), 1);
INSERT INTO BILL (BillID, Description, TotalCharge, BillDate, BillDueDate, PatientID)
VALUES
(2, 'X-ray Scan', 250.00, TO_DATE('2024-04-21', 'YYYY-MM-DD'), TO_DATE('2024-05-21',
'YYYY-MM-DD'), 2);
INSERT INTO BILL (BillID, Description, TotalCharge, BillDate, BillDueDate, PatientID)
VALUES
(3, 'Dermatology Consultation', 150.00, TO_DATE('2024-04-21', 'YYYY-MM-DD'),
TO_DATE('2024-05-21', 'YYYY-MM-DD'), 3);

--APPOINTMENT table
INSERT INTO APPOINTMENT (AppointmentID, AppointmentTime, Reason,
AppointmentDate, PatientID, ProviderID) VALUES
(1, TIMESTAMP '2024-04-21 09:00:00', 'Annual Checkup', TO_DATE('2024-04-21', 'YYYY-
MM-DD'), 1, 1);
INSERT INTO APPOINTMENT (AppointmentID, AppointmentTime, Reason,
AppointmentDate, PatientID, ProviderID) VALUES
(2, TIMESTAMP '2024-04-22 10:30:00', 'Follow-up on injury', TO_DATE('2024-04-22', 'YYYY-
MM-DD'), 2, 2);
INSERT INTO APPOINTMENT (AppointmentID, AppointmentTime, Reason,
AppointmentDate, PatientID, ProviderID) VALUES
(3, TIMESTAMP '2024-04-23 11:00:00', 'Skin examination', TO_DATE('2024-04-23', 'YYYY-
MM-DD'), 3, 3);
```

```
--MODIFIED table
INSERT INTO MODIFIED (ProviderID, RecordID, DateChange) VALUES (1, 1, SYSDATE);
INSERT INTO MODIFIED (ProviderID, RecordID, DateChange) VALUES (2, 2, SYSDATE);
INSERT INTO MODIFIED (ProviderID, RecordID, DateChange) VALUES (3, 3, SYSDATE);

--COVERED table
INSERT INTO COVERED (BillID, InsuranceID, CoverageAmount) VALUES (1, 1, 80.00);
INSERT INTO COVERED (BillID, InsuranceID, CoverageAmount) VALUES (2, 2, 200.00);
INSERT INTO COVERED (BillID, InsuranceID, CoverageAmount) VALUES (3, 3, 120.00);

--Make insertion permanently
COMMIT;


--2 SELECT QUERIES
--Query 1: Get the total number of appointments for each healthcare provider
SELECT p.ProviderFName, p.ProviderLName, COUNT(a.AppointmentID) AS
TotalAppointments
FROM PROVIDER p LEFT JOIN APPOINTMENT a ON p.ProviderID = a.ProviderID
GROUP BY p.ProviderFName, p.ProviderLName;

--Query 2: Get the total bill amount, coverage amount, and remaining charged amount for each
patient
SELECT p.PatientFName, p.PatientLName,
      SUM(b.TotalCharge) AS TotalBillAmount, SUM(c.CoverageAmount) AS
TotalCoverageAmount,
      (SUM(b.TotalCharge) - SUM(c.CoverageAmount)) AS TotalRemainingCharged
FROM PATIENT p JOIN BILL b ON p.PatientID = b.PatientID
   LEFT JOIN Covered c ON b.BillID = c.BillID
GROUP BY p.PatientFName, p.PatientLName;
```

Part 4: Work Distribution Table

Tasks	Elle Nguyen	Mary Le	Mihir Patel	Anthony Bockarie Jr
Initialize entities and attributes		×		
Brainstorm entities and attributes	×	×	×	×
Review ERD entities	×	×	×	×
Review ERD relationships			×	×
Create ERD	×			
Create ERD requirements	×			
Review project part 1	×	×	×	
Create relational schema	×			
Review project part 2	×	×	×	
CREATE TABLE statements	×			
Review CREATE TABLE statements		×		
INSERT TABLE statements		×	×	
Review INSERT TABLE statements	×			
Presentation Slides	×	×	×	×