ASSIGNMENT 2

1. Database Design (Normalization):

1. Create the database named "SISDB”

CREATE DATABASE SSIDB;

2. Define the schema for the Students, Courses, Enrollments, Teacher, and Payments tables based on the provided schema.

create database SSIDB;

use SSIDB;

create table Students (

student\_id int primary key,

first\_name varchar(50),

last\_name varchar(50),

date\_of\_birth date,

email varchar(100),

phone\_number varchar(15)

);

create table Courses (

course\_id int primary key,

course\_name varchar(100),

credits int,

teacher\_id int,

foreign key(teacher\_id) references Teachers(teacher\_id)

);

create table Enrollments (

enrollment\_id int primary key,

student\_id int,

course\_id int,

enrollment\_date date,

foreign key(student\_id) references Students(student\_id),

foreign key (course\_id) references Courses(course\_id)

);

create table Teachers (

teacher\_id int primary key,

first\_name varchar(50),

last\_name varchar(50),

email varchar(100)

);

create table Payments (

payment\_id int primary key,

student\_id int,

amount decimal(10, 2),

payment\_date date,

foreign key(student\_id) references Students(student\_id)

);

3. Perform the first three normal forms (1NF, 2NF, 3NF) analysis on the above tables.

1. First Normal form:

All tables are already in 1NF and they don’t contain any repeating groups.

Each table has a primary key and which is uniquely identify each record.

1. Second Normal form:

A table is in 2NF if it is in 1NF and non prime attributes are fully functionally dependent on primary key

The Courses table has a partial dependencies on the primary key because the “teacher\_id” is functionally dependent on part of the primary key “course\_id”.

Teachers Table

create table Teachers (

teacher\_id int primary key,

first\_name varchar(50),

last\_name varchar(50),

email varchar(100)

);

Course table – updated into 2NF

create table Courses (

course\_id int primary key,

course\_name varchar(100),

credits int,

teacher\_id int,

foreign key(teacher\_id) references Teachers(teacher\_id)

);

“teacher\_id” is fully functionally dependent on the primary key of the Teacher table

3.Third Normal Form:

A table is in 3NF if it is in 2NF, and no transitive dependencies

create table Enrollments (

enrollment\_id int primary key,

student\_id int,

course\_id int,

enrollment\_date date,

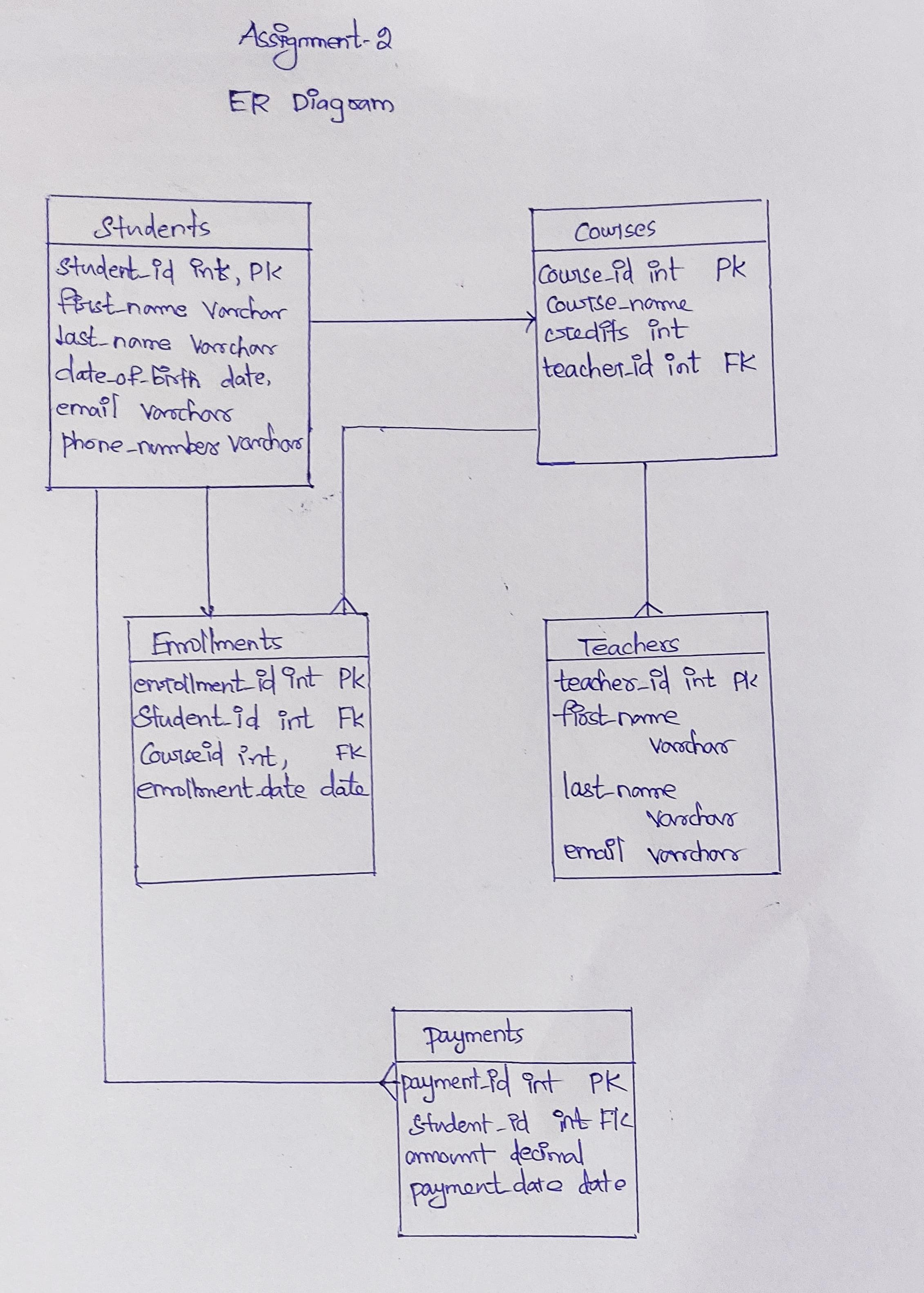
foreign key(student\_id) references Students(student\_id),

foreign key (course\_id) references Courses(course\_id)

);

Here All the tables are in 3NF

1. Create an ERD (Entity Relationship Diagram) for the database:



One to many relationship between Students and Enrollments

One to many relationship between Courses and Enrollments

Many to one relationship between Teachers and Courses

One to many relationship between Studemts and payments