ASSIGNMENT STUDENT INFORMATION SYSTEM (SIS)

Task 1. Database Design:

1. Create the database named "SISDB"

```
Enter password: ******************
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 25
Server version: 8.0.41 MySQL Community Server - GPL

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| dhanudb            |
| information_schema|
| mysql              |
| performance_schema|
| sys                |
| testdb             |
+--------------------+
6 rows in set (0.00 sec)

mysql> CREATE DATABASE SISDB;
Query OK, 1 row affected (0.01 sec)

mysql> USE SISDB;
Database changed
```

2. Define the schema for the Students, Courses, Enrollments, Teacher, and Payments tables based on the provided schema. Write SQL scripts to create the mentioned tables with appropriate data types, constraints, and relationships.

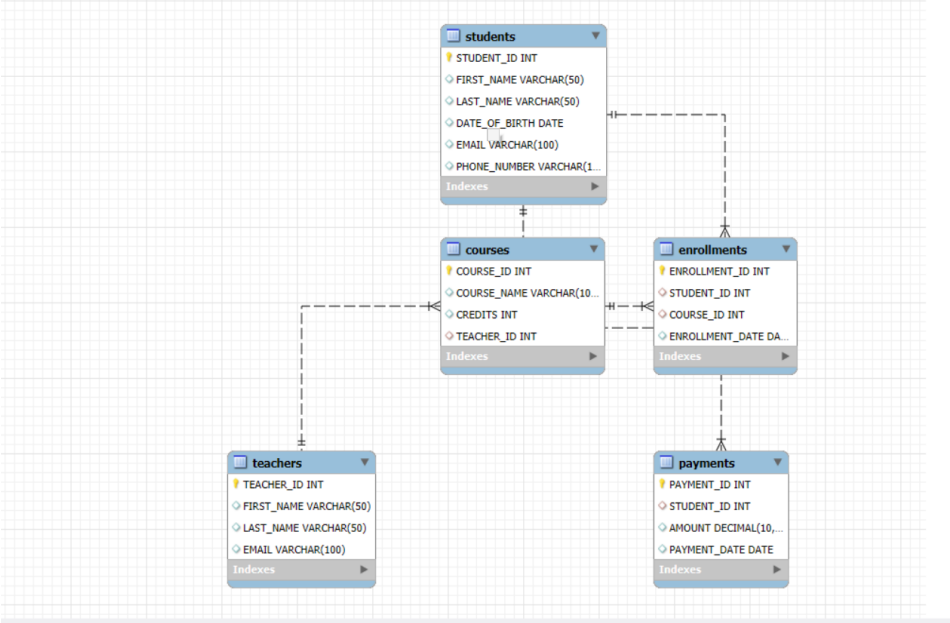
a. Students
b. Courses
c. Enrollments
d. Teacher
e. Payments

```
mysql>CREATE TABLE STUDENTS (
    -> STUDENT_ID  INT AUTO_INCREMENT,
    -> FIRST_NAME VARCHAR(50),
    -> LAST_NAME VARCHAR(50),
    -> DATE_OF_BIRTH DATE,
    -> EMAIL VARCHAR(100) UNIQUE,
    -> PHONE_NUMBER VARCHAR(15),
    -> CONSTRAINT STUDENTS_STUDENT_ID_PK PRIMARY KEY(STUDENT_ID)
);

Query OK, 0 rows affected, 1 warning (0.02 sec)
```

```
mysql> DESC STUDENTS;
+---------------+-------------+------+-----+---------+----------------+
| Field         | Type        | Null | Key | Default | Extra          |
+---------------+-------------+------+-----+---------+----------------+
| STUDENT_ID    | int         | NO   | PRI | NULL    | auto_increment |
| FIRST_NAME    | varchar(50) | YES  |     | NULL    |                |
| LAST_NAME     | varchar(50) | YES  |     | NULL    |                |
| DATE_OF_BIRTH | date        | YES  |     | NULL    |                |
| EMAIL         | varchar(100)| YES  | UNI | NULL    |                |
| PHONE_NUMBER  | varchar(15) | YES  |     | NULL    |                |
+---------------+-------------+------+-----+---------+----------------+
6 rows in set (0.00 sec)



mysql> CREATE TABLE TEACHERS (
    -> TEACHER_ID INT AUTO_INCREMENT,
    -> FIRST_NAME VARCHAR(50),
    -> LAST_NAME VARCHAR(50),
    -> EMAIL VARCHAR(100) UNIQUE,
    -> CONSTRAINT TEACHERS_TEACHER_ID_PK PRIMARY KEY(TEACHER_ID)

);

Query OK, 0 rows affected, 1 warning (0.02 sec)

mysql> DESC TEACHERS;
+------------+-------------+------+-----+---------+----------------+
| Field      | Type        | Null | Key | Default | Extra          |
+------------+-------------+------+-----+---------+----------------+
| TEACHER_ID | int         | NO   | PRI | NULL    | auto_increment |
| FIRST_NAME | varchar(50) | YES  |     | NULL    |                |
| LAST_NAME  | varchar(50) | YES  |     | NULL    |                |
| EMAIL      | varchar(100)| YES  | UNI | NULL    |                |
+------------+-------------+------+-----+---------+----------------+
4 rows in set (0.00 sec)

mysql> CREATE TABLE COURSES (
   -> COURSE_ID INT AUTO_INCREMENT,
   -> COURSE_NAME VARCHAR(100),
   -> CREDITS INT(10),
   -> TEACHER_ID INT(10),
   -> FOREIGN KEY (teacher_id) REFERENCES Teachers(teacher_id),
   -> CONSTRAINT COURSES_COURSE_ID_PK PRIMARY KEY(COURSE_ID)
);

Query OK, 0 rows affected, 3 warnings (0.03 sec)

mysql> DESC COURSES;
+-------------+-------------+------+-----+---------+----------------+
| Field       | Type        | Null | Key | Default | Extra          |
+-------------+-------------+------+-----+---------+----------------+
| COURSE_ID   | int         | NO   | PRI | NULL    | auto_increment |
| COURSE_NAME | varchar(100)| YES  |     | NULL    |                |
| CREDITS     | int         | YES  |     | NULL    |                |
| TEACHER_ID  | int         | YES  | MUL | NULL    |                |
+-------------+-------------+------+-----+---------+----------------+
4 rows in set (0.00 sec)

mysql> CREATE TABLE ENROLLMENTS (
    -> ENROLLMENT_ID INT(10) PRIMARY KEY AUTO_INCREMENT ,
    -> STUDENT_ID INT(10),
    -> COURSE_ID INT(10),
    -> ENROLLMENT_DATE DATE,
```

```
    -> FOREIGN KEY (STUDENT_ID) REFERENCES STUDENTS(STUDENT_ID) ,
    -> FOREIGN KEY (COURSE_ID) REFERENCES COURSES(COURSE_ID)
 );

Query OK, 0 rows affected, 3 warnings (0.01 sec)

mysql> DESC ENROLLMENTS;
+-----------------+------+------+-----+---------+----------------+
| Field           | Type | Null | Key | Default | Extra          |
+-----------------+------+------+-----+---------+----------------+
| ENROLLMENT_ID   | int  | NO   | PRI | NULL    | auto_increment |
| STUDENT_ID      | int  | YES  | MUL | NULL    |                |
| COURSE_ID       | int  | YES  | MUL | NULL    |                |
| ENROLLMENT_DATE | date | YES  |     | NULL    |                |
+-----------------+------+------+-----+---------+----------------+
4 rows in set (0.00 sec)


mysql> CREATE TABLE PAYMENTS (
    -> PAYMENT_ID INT (10) AUTO_INCREMENT,
    -> STUDENT_ID INT,
    -> AMOUNT DECIMAL(10,2),
    -> PAYMENT_DATE DATE,
    -> CONSTRAINT PAYMENTS_PAYMENT_ID_PK PRIMARY KEY(PAYMENT_ID),
    -> FOREIGN KEY (STUDENT_ID) REFERENCES Students(STUDENT_ID)
);

Query OK, 0 rows affected, 2 warnings (0.01 sec)

mysql> DESC PAYMENTS;
+--------------+---------------+------+-----+---------+----------------+
| Field        | Type          | Null | Key | Default | Extra          |
+--------------+---------------+------+-----+---------+----------------+
| PAYMENT_ID   | int           | NO   | PRI | NULL    | auto_increment |
| STUDENT_ID   | int           | YES  | MUL | NULL    |                |
| AMOUNT       | decimal(10,2) | YES  |     | NULL    |                |
| PAYMENT_DATE | date          | YES  |     | NULL    |                |
+--------------+---------------+------+-----+---------+----------------+
4 rows in set (0.00 sec)
```

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



4.Create appropriate Primary Key and Foreign Key constraints for referential integrity.

```
mysql> SHOW CREATE TABLE ENROLLMENTS;

 ENROLLMENTS | CREATE TABLE `enrollments` (
  `ENROLLMENT_ID` int NOT NULL AUTO_INCREMENT,
  `STUDENT_ID` int DEFAULT NULL,
  `COURSE_ID` int DEFAULT NULL,
  `ENROLLMENT_DATE` date DEFAULT NULL,
  PRIMARY KEY (`ENROLLMENT_ID`),
  KEY `STUDENT_ID` (`STUDENT_ID`),
  KEY `COURSE_ID` (`COURSE_ID`),
  CONSTRAINT `enrollments_ibfk_1` FOREIGN KEY (`STUDENT_ID`) REFERENCES
`students` (`STUDENT_ID`),
  CONSTRAINT `enrollments_ibfk_2` FOREIGN KEY (`COURSE_ID`) REFERENCES `courses`
(`COURSE_ID`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci

mysql> SHOW CREATE TABLE COURSES;

COURSES | CREATE TABLE `courses` (
  `COURSE_ID` int NOT NULL AUTO_INCREMENT,
  `COURSE_NAME` varchar(100) DEFAULT NULL,
  `CREDITS` int DEFAULT NULL,
  `TEACHER_ID` int DEFAULT NULL,
  PRIMARY KEY (`COURSE_ID`),
  KEY `TEACHER_ID` (`TEACHER_ID`),
  CONSTRAINT `courses_ibfk_1` FOREIGN KEY (`TEACHER_ID`) REFERENCES `teachers`
(`TEACHER_ID`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci

mysql> SHOW CREATE TABLE PAYMENTS;

 PAYMENTS | CREATE TABLE `payments` (
  `PAYMENT_ID` int NOT NULL AUTO_INCREMENT,
  `STUDENT_ID` int DEFAULT NULL,
  `AMOUNT` decimal(10,2) DEFAULT NULL,
  `PAYMENT_DATE` date DEFAULT NULL,
  PRIMARY KEY (`PAYMENT_ID`),
  KEY `STUDENT_ID` (`STUDENT_ID`),
  CONSTRAINT `payments_ibfk_1` FOREIGN KEY (`STUDENT_ID`) REFERENCES `students`
(`STUDENT_ID`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci

mysql> ALTER TABLE ENROLLMENTS DROP FOREIGN KEY FK_STUDENT;
Query OK, 0 rows affected (0.01 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> ALTER TABLE ENROLLMENTS DROP FOREIGN KEY FK_COURSE;
Query OK, 0 rows affected (0.01 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> ALTER TABLE COURSES DROP FOREIGN KEY FK_TEACHER;
Query OK, 0 rows affected (0.01 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> ALTER TABLE PAYMENTS DROP FOREIGN KEY FK_PAYMENT_STUDENT;
Query OK, 0 rows affected (0.01 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> ALTER TABLE COURSES
ADD CONSTRAINT FK_TEACHER FOREIGN KEY (TEACHER_ID)
REFERENCES TEACHERS(TEACHER_ID) ON DELETE SET NULL;
```

```
mysql> ALTER TABLE ENROLLMENTS
ADD CONSTRAINT FK_STUDENT FOREIGN KEY (STUDENT_ID)
REFERENCES STUDENTS(STUDENT_ID) ON DELETE CASCADE;

mysql> ALTER TABLE ENROLLMENTS
ADD CONSTRAINT FK_COURSE FOREIGN KEY (COURSE_ID)
REFERENCES COURSES(COURSE_ID) ON DELETE CASCADE;

mysql> ALTER TABLE PAYMENTS
ADD CONSTRAINT FK_PAYMENT_STUDENT FOREIGN KEY (STUDENT_ID)
REFERENCES STUDENTS(STUDENT_ID) ON DELETE CASCADE;

mysql> DESC STUDENTS;
+---------------+-------------+------+-----+---------+----------------+
| Field         | Type        | Null | Key | Default | Extra          |
+---------------+-------------+------+-----+---------+----------------+
| STUDENT_ID    | int         | NO   | PRI | NULL    | auto_increment |
| FIRST_NAME    | varchar(50) | YES  |     | NULL    |                |
| LAST_NAME     | varchar(50) | YES  |     | NULL    |                |
| DATE_OF_BIRTH | date        | YES  |     | NULL    |                |
| EMAIL         | varchar(100)| YES  | UNI | NULL    |                |
| PHONE_NUMBER  | varchar(15) | YES  |     | NULL    |                |
+---------------+-------------+------+-----+---------+----------------+
6 rows in set (0.00 sec)

mysql> DESC TEACHERS;
+------------+-------------+------+-----+---------+----------------+
| Field      | Type        | Null | Key | Default | Extra          |
+------------+-------------+------+-----+---------+----------------+
| TEACHER_ID | int         | NO   | PRI | NULL    | auto_increment |
| FIRST_NAME | varchar(50) | YES  |     | NULL    |                |
| LAST_NAME  | varchar(50) | YES  |     | NULL    |                |
| EMAIL      | varchar(100)| YES  | UNI | NULL    |                |
+------------+-------------+------+-----+---------+----------------+
4 rows in set (0.00 sec)

mysql> DESC COURSES;
+-------------+-------------+------+-----+---------+----------------+
| Field       | Type        | Null | Key | Default | Extra          |
+-------------+-------------+------+-----+---------+----------------+
| COURSE_ID   | int         | NO   | PRI | NULL    | auto_increment |
| COURSE_NAME | varchar(100)| YES  |     | NULL    |                |
| CREDITS     | int         | YES  |     | NULL    |                |
| TEACHER_ID  | int         | YES  | MUL | NULL    |                |
+-------------+-------------+------+-----+---------+----------------+
4 rows in set (0.00 sec)

mysql> DESC ENROLLMENTS;
+-----------------+------+------+-----+---------+----------------+
| Field           | Type | Null | Key | Default | Extra          |
+-----------------+------+------+-----+---------+----------------+
| ENROLLMENT_ID   | int  | NO   | PRI | NULL    | auto_increment |
| STUDENT_ID      | int  | YES  | MUL | NULL    |                |
| COURSE_ID       | int  | YES  | MUL | NULL    |                |
| ENROLLMENT_DATE | date | YES  |     | NULL    |                |
+-----------------+------+------+-----+---------+----------------+
4 rows in set (0.00 sec)
```

```
mysql> DESC PAYMENTS;
+--------------+---------------+------+-----+---------+----------------+
| Field        | Type          | Null | Key | Default | Extra          |
+--------------+---------------+------+-----+---------+----------------+
| PAYMENT_ID   | int           | NO   | PRI | NULL    | auto_increment |
| STUDENT_ID   | int           | YES  | MUL | NULL    |                |
| AMOUNT       | decimal(10,2) | YES  |     | NULL    |                |
| PAYMENT_DATE | date          | YES  |     | NULL    |                |
+--------------+---------------+------+-----+---------+----------------+
4 rows in set (0.00 sec)
```

5. Insert at least 10 sample records into each of the following tables.
i. Students
ii. Courses
iii. Enrollments
iv. Teacher
v. Payments

```
mysql> INSERT INTO STUDENTS  VALUES
(1, 'RAM', 'KUMAR', '2002-05-14', 'ram@gmail.com', '9876543210'),
(2, 'BOB', 'SMITH', '2001-08-22', 'bob@gmail.com', '9876543211'),
(3, 'RAJ', 'VEL', '2003-03-10', 'raj@gmail.com', '9876543212'),
(4, 'DAVID', 'RAV', '2000-11-25', 'david@gmail.com', '9876543213'),
(5, 'AMAL', 'Davis', '2002-07-17', 'amal@gmail.com', '9876543214'),
(6, 'KISHORE', 'ROY', '2001-09-30', 'roy@gmail.com', '9876543215'),
(7, 'JASMINE', 'RAV', '2003-02-18', 'jaz@gmail.com', '9876543216'),
(8, 'STELLA', 'MERRY', '2000-06-12', 'stella@gmail.com', '9876543217'),
(9, 'Isaac', 'newton', '2002-12-05', 'isaac@gmail.com', '9876543218'),
(10, 'RANI', 'RAM', '2001-04-08', 'rani@gmail.com', '9876543219');
```

```
mysql> SELECT*FROM STUDENTS;

+------------+------------+-----------+---------------+------------------+--------------+
| STUDENT_ID | FIRST_NAME | LAST_NAME | DATE_OF_BIRTH | EMAIL            | PHONE_NUMBER |
+------------+------------+-----------+---------------+------------------+--------------+
|          1 | RAM        | KUMAR     | 2002-05-14    | ram@gmail.com    | 9876543210   |
|          2 | BOB        | SMITH     | 2001-08-22    | bob@gmail.com    | 9876543211   |
|          3 | RAJ        | VEL       | 2003-03-10    | raj@gmail.com    | 9876543212   |
|          4 | DAVID      | RAV       | 2000-11-25    | david@gmail.com  | 9876543213   |
|          5 | AMAL       | Davis     | 2002-07-17    | amal@gmail.com   | 9876543214   |
|          6 | KISHORE    | ROY       | 2001-09-30    | roy@gmail.com    | 9876543215   |
|          7 | JASMINE    | RAV       | 2003-02-18    | jaz@gmail.com    | 9876543216   |
|          8 | STELLA     | MERRY     | 2000-06-12    | stella@gmail.com | 9876543217   |
|          9 | Isaac      | newton    | 2002-12-05    | isaac@gmail.com  | 9876543218   |
|         10 | RANI       | RAM       | 2001-04-08    | rani@gmail.com   | 9876543219   |
+------------+------------+-----------+---------------+------------------+--------------+
10 rows in set (0.00 sec)
```

```
mysql> INSERT INTO TEACHERS (TEACHER_ID, FIRST_NAME, LAST_NAME, EMAIL) VALUES
(1, 'SONA', 'KUMARI', 'sona.@gmail.com'),
(2, 'MERCY', 'PRINCE', 'mercy.jones@gmail.com'),
(3, 'MARTIN', 'RAJ', 'martin@gmail.com'),
(4, 'RANJITH', 'KUMAR', 'ranjith@gmail.com'),
(5, 'SANJAY', 'RAM', 'sanjya@gmail.com'),
(6, 'DHIVYA', 'PRIYA', 'dhivi@gmail.com'),
(7, 'AKALYA', 'MURUGESH', 'akalya@gmail.com'),
(8, 'VARSHINI', 'MARTIN', 'varsh@gmail.com'),
(9, 'KOWSI', 'LAKSHMI', 'kowsi@gmail.com'),
(10, 'PRIYA', 'RAV', 'priyarav@gmail.com');
```

```
mysql> SELECT*FROM TEACHERS;

+------------+------------+-----------+-----------------------+
| TEACHER_ID | FIRST_NAME | LAST_NAME | EMAIL                 |
+------------+------------+-----------+-----------------------+
|          1 | SONA       | KUMARI    | sona.@gmail.com       |
|          2 | MERCY      | PRINCE    | mercy.jones@gmail.com |
|          3 | MARTIN     | RAJ       | martin@gmail.com      |
|          4 | RANJITH    | KUMAR     | ranjith@gmail.com     |
|          5 | SANJAY     | RAM       | sanjya@gmail.com      |
|          6 | DHIVYA     | PRIYA     | dhivi@gmail.com       |
|          7 | AKALYA     | MURUGESH  | akalya@gmail.com      |
|          8 | VARSHINI   | MARTIN    | varsh@gmail.com       |
|          9 | KOWSI      | LAKSHMI   | kowsi@gmail.com       |
|         10 | PRIYA      | RAV       | priyarav@gmail.com    |
+------------+------------+-----------+-----------------------+
10 rows in set (0.00 sec)

mysql> ALTER TABLE COURSES ADD CONSTRAINT CHK_COURSE_NAME
CHECK (COURSE_NAME IN ('JAVA', 'PYTHON', 'C#', 'C', 'C++', 'JAVASCRIPT',
'SQL', 'HTML', 'CSS', 'DATA SCIENCE'));

mysql> INSERT INTO COURSES (COURSE_NAME, CREDITS, TEACHER_ID) VALUES
('JAVA', 3, 1),
('python', 4, 2),
('C#', 3, 3),
('C', 4, 4),
('C++', 3, 5),
('JAVASCRIPT', 3, 6),
('SQL', 3, 7),
('HTML', 3, 8),
('CSS', 3, 9),
('DATA SCIENCE', 3, 10);

mysql> SELECT*FROM COURSES;
+-----------+--------------+---------+------------+
| COURSE_ID | COURSE_NAME  | CREDITS | TEACHER_ID |
+-----------+--------------+---------+------------+
|         1 | JAVA         |       3 |          1 |
|         2 | python       |       4 |          2 |
|         3 | C#           |       3 |          3 |
|         4 | C            |       4 |          4 |
|         5 | C++          |       3 |          5 |
|         6 | JAVASCRIPT   |       3 |          6 |
|         7 | SQL          |       3 |          7 |
|         8 | HTML         |       3 |          8 |
|         9 | CSS          |       3 |          9 |
|        10 | DATA SCIENCE |       3 |         10 |
+-----------+--------------+---------+------------+
10 rows in set (0.00 sec)



mysql> INSERT INTO ENROLLMENTS  VALUES
(1, 1, 1, '2024-01-10'),
(2, 2, 2, '2024-01-11'),
(3, 3, 3, '2024-01-12'),
(4, 4, 4, '2024-01-13'),
(5, 5, 5, '2024-01-14'),
(6, 6, 6, '2024-01-15'),
(7, 7, 7, '2024-01-16'),
(8, 8, 8, '2024-01-17'),
(9, 9, 9, '2024-01-18'),
(10, 10, 10, '2024-01-19');
```

```
mysql> SELECT*FROM ENROLLMENTS;
+---------------+------------+-----------+-----------------+
| ENROLLMENT_ID | STUDENT_ID | COURSE_ID | ENROLLMENT_DATE |
+---------------+------------+-----------+-----------------+
|             1 |          1 |         1 | 2024-01-10      |
|             2 |          2 |         2 | 2024-01-11      |
|             3 |          3 |         3 | 2024-01-12      |
|             4 |          4 |         4 | 2024-01-13      |
|             5 |          5 |         5 | 2024-01-14      |
|             6 |          6 |         6 | 2024-01-15      |
|             7 |          7 |         7 | 2024-01-16      |
|             8 |          8 |         8 | 2024-01-17      |
|             9 |          9 |         9 | 2024-01-18      |
|            10 |         10 |        10 | 2024-01-19      |
+---------------+------------+-----------+-----------------+
10 rows in set (0.00 sec)

mysql> INSERT INTO PAYMENTS (PAYMENT_ID, STUDENT_ID, AMOUNT, PAYMENT_DATE) VALUES
(1, 1, 5000.00, '2024-02-01'),
(2, 2, 4500.00, '2024-02-02'),
(3, 3, 4800.00, '2024-02-03'),
(4, 4, 4700.00, '2024-02-04'),
(5, 5, 4600.00, '2024-02-05'),
(6, 6, 4900.00, '2024-02-06'),
(7, 7, 5100.00, '2024-02-07'),
(8, 8, 5200.00, '2024-02-08'),
(9, 9, 5300.00, '2024-02-09'),
(10, 10, 5400.00, '2024-02-10');

mysql> SELECT*FROM PAYMENTS;
+------------+------------+---------+--------------+
| PAYMENT_ID | STUDENT_ID | AMOUNT  | PAYMENT_DATE |
+------------+------------+---------+--------------+
|          1 |          1 | 5000.00 | 2024-02-01   |
|          2 |          2 | 4500.00 | 2024-02-02   |
|          3 |          3 | 4800.00 | 2024-02-03   |
|          4 |          4 | 4700.00 | 2024-02-04   |
|          5 |          5 | 4600.00 | 2024-02-05   |
|          6 |          6 | 4900.00 | 2024-02-06   |
|          7 |          7 | 5100.00 | 2024-02-07   |
|          8 |          8 | 5200.00 | 2024-02-08   |
|          9 |          9 | 5300.00 | 2024-02-09   |
|         10 |         10 | 5400.00 | 2024-02-10   |
+------------+------------+---------+--------------+
10 rows in set (0.00 sec)
```