CREATE TABLE IF NOT EXISTS StudentPreference (

StudentId INT,

SubjectId VARCHAR(20),

Preference INT,

PRIMARY KEY (StudentId, SubjectId)

);

CREATE TABLE IF NOT EXISTS SubjectDetails (

SubjectId VARCHAR(20),

SubjectName VARCHAR(100),

MaxSeats INT,

RemainingSeats INT,

PRIMARY KEY (SubjectId)

);

CREATE TABLE IF NOT EXISTS StudentDetails (

StudentId INT,

StudentName VARCHAR(100),

GPA FLOAT,

Branch VARCHAR(50),

Section VARCHAR(10),

PRIMARY KEY (StudentId)

);

CREATE TABLE IF NOT EXISTS Allotments (

SubjectId VARCHAR(20),

StudentId INT,

PRIMARY KEY (SubjectId, StudentId)

);

CREATE TABLE IF NOT EXISTS UnallottedStudents (

StudentId INT,

PRIMARY KEY (StudentId)

);

DELIMITER $$

CREATE PROCEDURE AllocateSubjects()

BEGIN

DECLARE done INT DEFAULT 0;

DECLARE studentId INT;

DECLARE subjectId VARCHAR(20);

DECLARE preference INT;

DECLARE gpa FLOAT;

DECLARE maxSeats INT;

DECLARE remainingSeats INT;

-- Cursor to iterate over students sorted by GPA in descending order

DECLARE student\_cursor CURSOR FOR

SELECT StudentId, GPA

FROM StudentDetails

ORDER BY GPA DESC;

-- Cursor to iterate over student preferences

DECLARE preference\_cursor CURSOR FOR

SELECT SubjectId, Preference

FROM StudentPreference

WHERE StudentId = studentId

ORDER BY Preference;

DECLARE CONTINUE HANDLER FOR NOT FOUND SET done = 1;

-- Open student cursor

OPEN student\_cursor;

read\_students: LOOP

-- Fetch next student

FETCH student\_cursor INTO studentId, gpa;

IF done THEN

LEAVE read\_students;

END IF;

SET done = 0; -- Reset done for preference cursor

-- Open preference cursor for the current student

SET done = 0;

OPEN preference\_cursor;

read\_preferences: LOOP

-- Fetch next preference

FETCH preference\_cursor INTO subjectId, preference;

IF done THEN

LEAVE read\_preferences;

END IF;

-- Check remaining seats for the subject

SELECT MaxSeats, RemainingSeats INTO maxSeats, remainingSeats

FROM SubjectDetails

WHERE SubjectId = subjectId;

IF remainingSeats > 0 THEN

-- Allocate the subject to the student

INSERT INTO Allotments (SubjectId, StudentId)

VALUES (subjectId, studentId);

-- Update remaining seats

UPDATE SubjectDetails

SET RemainingSeats = RemainingSeats - 1

WHERE SubjectId = subjectId;

LEAVE read\_preferences; -- Exit loop once a subject is allocated

END IF;

END LOOP;

-- Close preference cursor

CLOSE preference\_cursor;

-- If no subject is allocated, mark the student as unallotted

IF done THEN

INSERT INTO UnallottedStudents (StudentId)

VALUES (studentId);

END IF;

SET done = 0; -- Reset done for student cursor

END LOOP;

-- Close student cursor

CLOSE student\_cursor;

END$$

DELIMITER ;