Database Requirements: University Database

Entities and Attributes

- **Students:**
  - StudentID (primary key, integer)
  - FirstName (string)
  - LastName (string)
  - DateOfBirth (date)
  - Major (string)
- **Courses:**
  - CourseID (primary key, integer)
  - CourseName (string)
  - Department (string)
  - Credits (integer)
- **Instructors:**
  - InstructorID (primary key, integer)
  - FirstName (string)
  - LastName (string)
- **Enrollments:**
  - EnrollmentID (primary key, integer)
  - StudentID (foreign key, references Students)
  - CourseID (foreign key, references Courses)
  - InstructorID (foreign key, references Instructors)
  - Grade (string)

Relationships

- **One-to-many:** A student can enroll in many courses, but a course can have many students enrolled.
- **Many-to-many:** An instructor can teach many courses, and a course can be taught by many instructors.

Constraints

- **Primary Key:** Each table should have a unique primary key to identify each row.
- **Foreign Key:** Relationships between tables should be defined using foreign keys.
- **Data Types:** Appropriate data types should be used for each attribute based on the expected data.
- **Not Null:** Certain attributes may be required and should not allow null values.

Additional Considerations

- **Indexes:** Consider creating indexes on frequently searched columns to improve query performance.

- **Check Constraints:** Enforce specific conditions on column values.
- **Default Values:** Specify default values for certain attributes.
- **Data Integrity:** Ensure data integrity through appropriate constraints and validation rules.

Check Constraints for the University Database

Students:

- **Age Limit:** Ensure students are of a certain age to enroll (18 years or older)
- **Major Validity:** Verify that the major is from a predefined list:
    - **Computer Science**
    - **Engineering**
    - **Business**
    - **Arts**
    - **Science**

Courses:

- **Credit Range:** Ensure the credits are between 1 and 6

Enrollments:

- **Grade Range:** Verify that the grade is within a valid range:
    - 'A+', 'A', 'A-', 'B+', 'B', 'B-', 'C+', 'C', 'C-', 'D+', 'D', 'D-', 'F'

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