📘 ER Diagram Explanation – Tuition Aid System

This Entity-Relationship Diagram (ERD) models how the tuition aid application process is structured and managed within the database.

🧩 Entities & Attributes

1. **Student**
    - Stores details about each applicant.
    - Attributes:
        - student_id (PK)
        - name, email (unique), date_of_birth
        - family_income, gpa
    - Each student can submit multiple applications (1:M relationship).
2. **Application**
    - Represents a student's request for tuition aid.
    - Attributes:
        - application_id (PK), submission_date, status, approved_amount
        - student_id is a FK referencing Student
    - Each application may result in a disbursement.
3. **Administrator**
    - Represents admin users who review applications.
    - Attributes:
        - admin_id (PK), name, role (default is “Reviewer”)
    - Related to Application via a reviewing action (optional FK).
4. **FundingSource**
    - Represents institutions or organizations providing the aid.
    - Attributes:

        - source_id (PK), organization_name, available_funds
    - Each source may fund multiple disbursements.
5. **Disbursement**
    - Records when and how much aid was released.
    - Attributes:
        - disbursement_id (PK), application_id, source_id, amount, date
        - FKs to both Application and FundingSource

🔁 **Relationships Overview**

- **Student → Application**: One-to-many
  → A student can submit multiple applications.
- **Application → Disbursement**: One-to-one
  → Each application can be approved and matched with one disbursement.
- **FundingSource → Disbursement**: One-to-many
  → A source can fund multiple disbursements.
- **Administrator → Application**: Optional review
  → Admins review applications but are not tightly bound in schema.

🔐 **Constraints & Features**

- **Primary & Foreign Keys** maintain data consistency.
- **Default Values** and field constraints (like unique email, default role) enforce rules.
- The ERD is **normalized** to reduce redundancy (3NF-compliant).
