**This model is presented in an Entity-Relationship Diagram (ERD) style, along with the table structures and their attributes.**

**Data Model Overview**

**The system has four core entities:**

1. **Universities**
2. **Admissions**
3. **Costs**
4. **Performance**
5. **Available Programs**
6. **Credentials**

**Relationships Between Tables**

* **universities → admissions: One university can have multiple admission records (one-to-many relationship).**
* **universities → costs: One university can have one set of cost-related data (one-to-one relationship).**
* **universities → performance: One university can have one set of performance metrics (one-to-one relationship).**

**Relationships Between Tables**

* **Universities → Admissions**: One university can have multiple admission records (one-to-many).
* **Universities → Costs**: One university has one record for its costs (one-to-one).
* **Universities → Performance**: One university has one record for its performance metrics (one-to-one).

**Many-to-One Relationship**: The available\_programs table has a many-to-one relationship with the universities table. Each university can offer multiple programs, but each program is associated with only one university.

**Many-to-One: The credentials table has a many-to-one relationship with the universities table. A university may offer multiple types of credentials, but each credential is associated with only one university.**

* 1. **Universities Table**

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| **Column** | **Type** | **Description** |
| **university\_id** | **INT** | **Primary Key: Unique identifier for each university** |
| **name** | **VARCHAR(255)** | **Name of university** |
| **location** | **VARCHAR(255)** | **City and state of the university** |
| **school\_type** | **VARCHAR(50)** | **Type of the university ('Public' or 'Private')** |
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**2. Admissions Table**

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| **Column** | **Type** | **Description** |
| **admission\_id** | **INT** | **Primary Key: Unique identifier for the admission record** |
| **university\_id** | **INT** | **Foreign Key: References universities.university\_id** |
| **acceptance\_rate** | **FLOAT** | **Percentage of accepted applicants** |
|  |  |  |
| **sat\_scores** | **VARCHAR(100)** | **SAT score range or average SAT score for admitted students.** |
| **act\_scores** | **VARCHAR(100)** | **ACT score range or average ACT score for admitted students.** |

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|  |  |  |  | **3. Costs Table**   |  |  |  | | --- | --- | --- | | **Column** | **Type** | **Description** | | **cost\_id** | **INT** | **Primary Key: Unique identifier for the cost record** | | **university\_id** | **INT** | **Foreign Key: References universities.university\_id.** | | **in\_state\_tuition** | **FLOAT** | **In-state tuition fee (USD)** | | **out\_of\_state\_tuition** | **FLOAT** | **Out-of-state tuition fee (USD)** | | **financial\_aid\_percent** | **FLOAT** | **Percentage of students receiving financial aid** | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- |   **4. Performance Table**   |  |  |  | | --- | --- | --- | | **Column** | **Type** | **Description** | | **performance\_id** | **INT** | **Primary Key: Unique identifier for the performance record** | | **university\_id** | **INT** | **Foreign Key: References universities.university\_id** | | **graduation\_rate** | **FLOAT** | **Graduation rate percentage** | | **retention\_rate** | **FLOAT** | **Retention rate percentage** |  * 1. **Available Programs Table**  |  |  |  | | --- | --- | --- | | **Column** | **Type** | **Description** | | **course\_id** | **INT** | **Primary Key: Unique identifier for each course.** | | **university\_id** | **INT** | **Foreign Key: References universities.university\_id** | | **course\_name** | **VARCHAR(255)** | **Name of the course or program.** | | **course\_description** | **TEXT** | **A short description of the course or program.** | | **department** | **VARCHAR(255)** | **The academic department offering the course.** | | **credit\_hours** | **INT** | **Number of credit hours for the course.** | | **course\_level** | **VARCHAR(50)** | **The level of the course (Undergraduate, Graduate).** |  * 1. **Credentials Table**  |  |  |  | | --- | --- | --- | | **Column** | **Type** | **Description** | | **credential\_id** | **INT** | **Primary Key: Unique identifier for each credential** | | **university\_id** | **INT** | **Foreign Key: References universities.university\_id** | | **credential\_name** | **VARCHAR(255)** | **Name of the credential (e.g., Bachelor’s Degree, Master’s Degree)** | | **credential\_type** | **VARCHAR(100)** | **Type of the credential (e.g., Undergraduate, Graduate, etc.)** | | **program\_type** | **VARCHAR(100)** | **Type of the program (e.g., Full-time, Part-time)** | | **duration** | **VARCHAR(50)** | **Duration of the program (e.g., 2 years, 4 years)** | | **department** | **VARCHAR(255)** | **Academic department offering the credential** | | **credit\_hours\_required** | **INT** | **Number of credit hours required to complete the credential** |  |  | | --- | |  |  |  |  | | --- | --- | | |  | |  | |
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|  |  |  |  | -- Universities Table  CREATE TABLE universities (  university\_id INT PRIMARY KEY,  name VARCHAR(255),  location VARCHAR(255),  school\_type VARCHAR(50)  );  -- Admissions Table  CREATE TABLE admissions (  admission\_id INT PRIMARY KEY,  university\_id INT,  acceptance\_rate FLOAT,  sat\_scores VARCHAR(100),  act\_scores VARCHAR(100),  FOREIGN KEY (university\_id) REFERENCES universities(university\_id)  );  -- Costs Table  CREATE TABLE costs (  cost\_id INT PRIMARY KEY,  university\_id INT,  in\_state\_tuition FLOAT,  out\_of\_state\_tuition FLOAT,  financial\_aid\_percent FLOAT,  FOREIGN KEY (university\_id) REFERENCES universities(university\_id)  );  -- Performance Table  CREATE TABLE performance (  performance\_id INT PRIMARY KEY,  university\_id INT,  graduation\_rate FLOAT,  retention\_rate FLOAT,  FOREIGN KEY (university\_id) REFERENCES universities(university\_id)  );  -- Available Programs Table  CREATE TABLE available\_programs (  course\_id INT PRIMARY KEY,  university\_id INT,  course\_name VARCHAR(255),  course\_description TEXT,  department VARCHAR(255),  credit\_hours INT,  course\_level VARCHAR(50),  FOREIGN KEY (university\_id) REFERENCES universities(university\_id)  );  -- Credentials Table  CREATE TABLE credentials (  credential\_id INT PRIMARY KEY,  university\_id INT,  credential\_name VARCHAR(255),  credential\_type VARCHAR(100),  program\_type VARCHAR(100),  duration VARCHAR(50),  department VARCHAR(255),  credit\_hours\_required INT,  FOREIGN KEY (university\_id) REFERENCES universities(university\_id)  ); | |  | |  | |
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