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Brief Introduction

We will walk through the steps to install and use this system.

This system was designed to help out users with historical records of program they want to join.

Data Sources

- *Academic departments*. Academic Departments | Maryland Smith. (2023). https://www.rhsmith.umd.edu/departments
- *Graduate tuition & fees*. Graduate Tuition & Fees | Student Financial Services and Cashiering. (2023). https://billpay.umd.edu/GraduateTuition
- *College rankings and lists | US news best colleges*. US news best colleges. (2023). https://www.usnews.com/best-colleges/rankings
- *World University Rankings*. Times Higher Education (THE). (2023, November 30). https://www.timeshighereducation.com/world-university-rankings
- *Shanghairanking*. Academic Ranking of World Universities. (2023). https://www.shanghairanking.com/
- *Round University ranking.* Round University Ranking. (2023). https://roundranking.com/
- *QS universities rankings - top global universities & colleges*. Top Universities. (2023). https://www.topuniversities.com/university-rankings

Database Structure

Department

Key	Type	Description
dptId	Char(3)	Department ID
dptName	Varchar(100)	Name of the Department
dptChair	Varchar(50)	Chairperson of the Department
dptBuilding	Varchar(50)	Building where the program is located
dptOffice	Varchar(4)	Office / Room Number of the program

Program

Key	Type	Description
pgmId	Char(4)	Program ID
pgmName	Varchar(50)	Program Name
pgmDirector	Varchar(50)	Director of the program
pgmLevel	Varchar(20)	Level of the program (MS, MBA, etc)
pgmDuration	Varchar(50)	Duration of the program
pgmCredits	Integer	Credits required to complete program
dptId	Char(3)	Department ID which offers the program

Source

Key	Type	Description
srcName	Varchar(50)	Source Name which publishes the ranking
srcLink	Varchar(250)	Link of the Source
srcType	Varchar(30)	Type of Source (Online, Offline, etc)

Ranking Factor

Key	Type	Description
rnkYear	Integer	Published Year
pgmId	Char(4)	Program ID for these factors are defined
rnkStudentIntake	Integer	Student Intake of the program
rnfTuitionFees	Decimal(10,2)	Tuition Fees of the program for a year
rnfAverageSalary	Decimal(10,2)	Average Salary for the students who graduated that year from the program

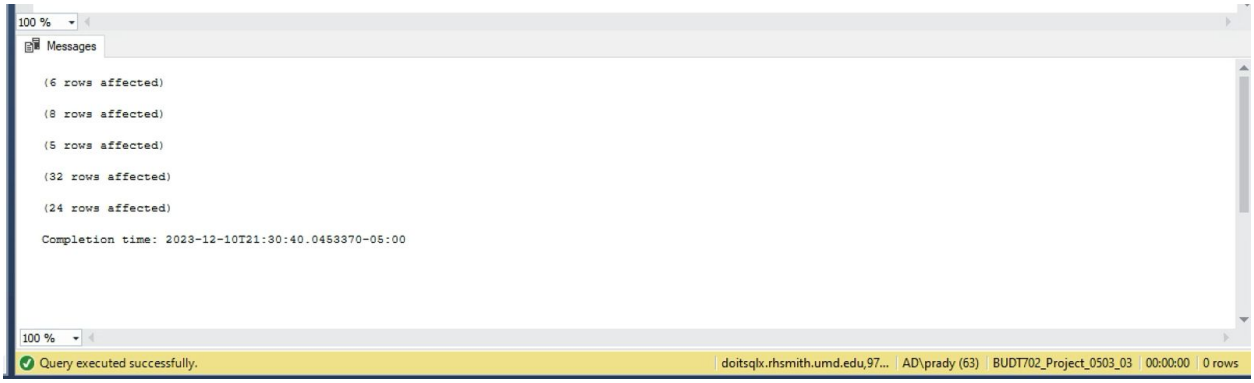
Ranking

Key	Type	Description
rnkScore	Integer	The rank of a program
pgmId	Char(4)	Program ID
rnfYear	Integer	Year of the given rank
srcName	Varchar(50)	Source of the rank

Installation Steps

1. Download the DMD and DDL files.
2. Open the DMD file.
3. Run the DMD file and you will get the following output.

(**Creating Tables**)



4. Open the DDL files
5. Run the DDL file which will produce the outputs of WH questions. (Run query one by one by selecting them)

Testing

In the testing phase of a database project, the process is divided into several critical steps, each aimed at ensuring the database system operates as intended and meets the project's objectives.

1. Unit Testing: This stage focuses on a detailed examination of each element within the database, including tables, views, and stored procedures. The goal is to verify the correctness of their structure and functionality. Important aspects include validating the data types, constraints, and indexes in each table to ensure they align with the design specifications. Testing each query for expected results and performance is also essential. This step-by-step approach is crucial for identifying and rectifying any issues at the most granular level of the database.

2. Integration Testing: Following unit testing, the focus shifts to integration testing. This stage involves examining the interactions between different parts of the database, especially how tables relate and interact with each other. It's vital to verify the integrity of data as it moves across various tables and components of the system. This process ensures that data relationships are maintained correctly and that the integrated components work together seamlessly. This step is key in confirming that the database functions cohesively as a unified system.

3. System Testing: The final phase is system testing, where the emphasis is on verifying all the key functionalities of the database system. This includes extensive testing of essential operations such as data insertion, updating, deletion, and retrieval. The objective here is to ensure that each of these functions performs as expected under a variety of scenarios. This involves creating, modifying, and

removing data in the database and then retrieving it to confirm that these operations are executed correctly and efficiently.

Running Select Query

1. Finding the average of the rankings of the programs over the years for each department.

```
--Finding the average of the rankings of the programs over the years for each department.


SELECT d.dptName AS 'Department Name', (AVG(r.rnkScore)) AS 'Average Ranking'
FROM [Rankbusters.Department] d
    JOIN [Rankbusters.Program] p ON d.dptId = p.dptId
    JOIN [Rankbusters.Ranking] r ON p.pgmId = r.pgmId
GROUP BY d.dptName;
```

Results | Messages

	Department Name	Average Ranking
1	Accounting & Information Assurance	80
2	Decision, Operations & Information Logistics	26
3	Finance	46
4	Logistics, Business & Public Policy	27
5	Management & Organization	102
6	Marketing	38

Query executed successfully. | doitsqlx.rhsmith.umd.edu,97... | AD\prady (67) | BUDT702_Project_0503_03 | 00:00:00 | 6 rows

2. Attaining the highest rankings for the programs over the years.

```
--Obtaining the program levels (MBA, MS, etc.) that have the highest average rankings over the years


SELECT p.pgmLevel AS 'Program Level', AVG(r.rnkScore) AS 'Average Ranking'
FROM [Rankbusters.Program] p
JOIN [Rankbusters.Ranking] r ON p.pgmId = r.pgmId
GROUP BY p.pgmLevel
ORDER BY 'Average Ranking' DESC;
```

100 %

Results | Messages

	Program Level	Average Ranking
1	MiM	102
2	MQF	46
3	MFin	46
4	MS	42

Query executed successfully. | doitsqlx.rhsmith.umd.edu,97... | AD\prady (67) | BUDT702_Project_0503_03 | 00:00:00 | 4 rows

3. Obtaining the program levels (MBA, MS, etc.) that have the highest average rankings over the years.

```
-- Attaining the highest rankings for the programs over the years


SELECT p.pgmName AS 'Program Name', p.pgmId AS 'Program ID', r.rnfYear AS 'Year', r.rnkScore AS 'Highest Ranking'
FROM [Rankbusters.Program] p
JOIN [Rankbusters.Ranking] r ON p.pgmId = r.pgmId
    INNER JOIN (SELECT pgmId, MIN(rnkScore) AS MaxRanking
                FROM [Rankbusters.Ranking]
                GROUP BY pgmId
                ) AS maxRank ON p.pgmId = maxRank.pgmId AND r.rnkScore = maxRank.MaxRanking
ORDER BY p.pgmName, r.rnkScore DESC;
```

100 %

Results | Messages

	Program Name	Program ID	Year	Highest Ranking
1	Accounting	1003	2020	65
2	Business Analytics	1002	2023	16
3	Finance	1004	2022	42
4	Information Systems	1001	2023	7
5	Management Studies	1006	2023	57
6	Marketing Analytics	1005	2022	37
7	Quantitative Finance	1008	2022	42
8	Supply Chain Management	1007	2022	26

Query executed successfully. | doitsqlx.rhsmith.umd.edu,97... | AD\prady (67) | BUDT702_Project_0503_03 | 00:00:00 | 8 rows

4. Finding departments which offer the most programs that have been ranked in the top 50 by 1 or more sources.

```
--Finding departments which offer the most programs that have been ranked in the top 50 by 1 or many sources:


SELECT d.dptName AS 'Department Name', COUNT(DISTINCT p.pgmId) AS 'Top Program Count'
FROM [Rankbusters.Department] d
JOIN [Rankbusters.Program] p ON d.dptId = p.dptId
JOIN [Rankbusters.Ranking] r ON p.pgmId = r.pgmId
WHERE r.rnkScore <= 50
GROUP BY d.dptName
ORDER BY 'Top Program Count' DESC;
```

Results | Messages

	Department Name	Top Program Count
1	Decision, Operations & Information Logistics	2
2	Finance	2
3	Logistics, Business & Public Policy	1
4	Marketing	1

Query executed successfully. | doitsqlx.rhsmith.umd.edu,97... | AD\prady (67) | BUDT702_Project_0503_03 | 00:00:00 | 4 rows

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