UMD Smith School Program Ranking

BUDT702 | Database Management Systems

0502 | Group **10** *SQL Samurai* | 10th Dec 2023

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Under the guidance of our ***Prof. Woei-Jyh (Adam) Lee***

UNIVERSITY OF MARYLAND FEARLESSLY FORWARD

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BACKGROUND

USERS

- ➔ Administrators and Decision Makers
- ➔ Faculty Members
- ➔ Alumni
- ➔ Students
- ➔ Office of Career Services

DATA SOURCES

- ➔ Smith School Program websites / UMD Directory
- ➔ Research publications / Faculty CVs
- ➔ College finder websites (US News, QS, Quantnet, Economist, Financial Times, College Factual, etc.)
- ➔ Blog posts and articles from reputable sources
- ➔ LinkedIn

INTRODUCTION

MISSION STATEMENT

- ➔ Develop a database for monitoring and evaluating program performance at the Robert H. Smith School of Business, University of Maryland, College Park.
- ➔ Provide accurate, timely data for informed decision-making.
- ➔ Enhance program quality and strengthen the school's competitive position in higher education.
- ➔ Scope limited to Masters of Science (MS) and Masters in Business Administration (MBA) programs offered by the Smith School.
- ➔ Strive for ongoing improvement, emphasizing the strategic impact on program development and maintaining competitive excellence in higher education.

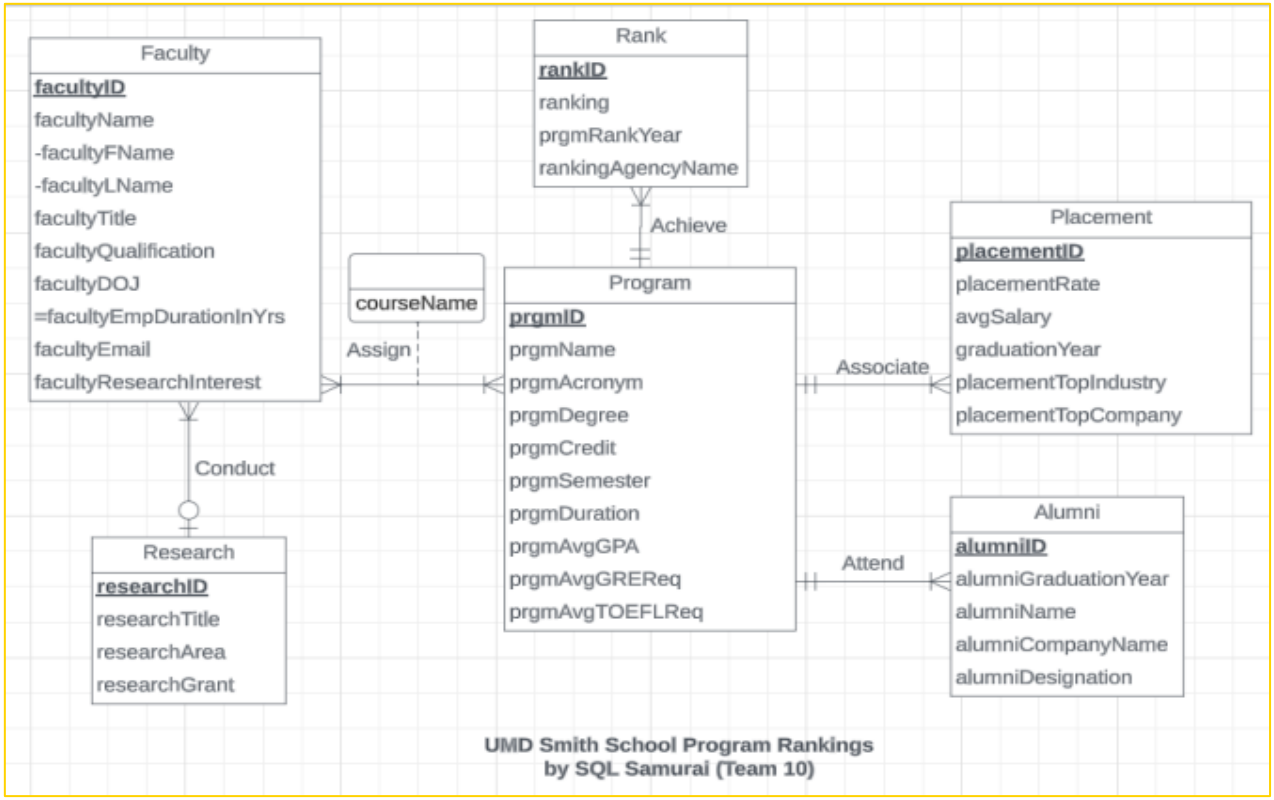
INTRODUCTION

MISSION OBJECTIVE

- ➔ The objective is to create a comprehensive database that not only records the program rankings but also covers factors that potentially affect these rankings.
- ➔ The thought process behind this project is that the database analysis will serve as IS Consulting Services to a hypothetical client.
- ➔ The database will support all CRUD operations and follow the guidelines and rules that are listed in the book - 'Modern Database Management 13th Edition' by Jeffrey A. Hoffer, V. Ramesh & Heikki Topi.
- ➔ The team has devised the database in a way that all below mentioned roles will be taken into consideration :

  information systems analyst, database designer, database developer and application developer.

CONCEPTUAL DATABASE DESIGN



LOGICAL DATABASE DESIGN

Relational Schema:

1. Program (**prgmID**, prgmName, prgmAcronym, prgmDegree, prgmCredit, prgmSemester, prgmDuration, prgmAvgGPA, prgmAvgGREReq, prgmAvgTOEFLReq)
2. Rank (**rankID,** ranking, prgmRankYear, rankingAgencyName, *prgmID*)
3. Faculty (**facultyID**, facultyFName, facultyLName, facultyTitle, facultyQualification, facultyDOJ, facultyEmail, facultyResearchInterest)
4. Research (**researchID**, researchTitle, reserchArea, researchGrant, *facultyID*)
5. Placement (**placementID**, placementRate, avgSalary, graduationYear, placementTopIndustry, placementTopCompany, *prgmID*)
6. Alumni (**alumniID**, alumniGraduationYear, alumniName, alumniCompanyName, alumniDesignation, *prgmID*)
7. Assign (courseName, ***prgmID***, ***facultyID***)

PHYSICAL DATABASE DESIGN

CREATE Table statement for Program:

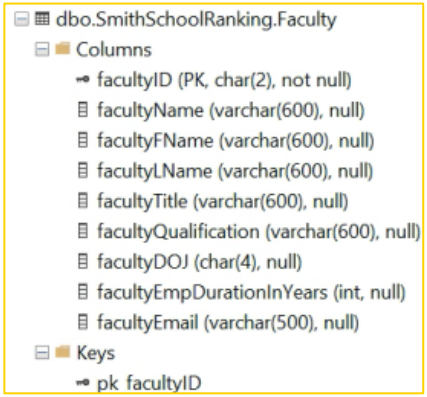
```
CREATE TABLE [SmithSchoolRanking.Program] (
prgmID CHAR (2) NOT NULL,
prgmName VARCHAR (50),
prgmAcronym VARCHAR (5),
prgmDegree VARCHAR (6),
prgmCredit CHAR (2),
prgmSemester CHAR (2),
prgmDuration CHAR (2),
prgmAvgGPA DECIMAL (2,1),
prgmAvgGREReq CHAR (3),
prgmAvgTOFELReq VARCHAR (3),
    CONSTRAINT pk_Program_prgmID PRIMARY KEY (prgmID),
);
```

	Program Name	Program Acronym	Program Degree	No. of Credits	No. of Semesters	Program Duration	Average GPA Requirement	Average GRE Requirement	Average TOEFL Requirement
1	Information Systems	IS	M.S.	30	3	16	3.5	310	100
2	Business Analytics	BA	M.S.	30	3	16	3.3	307	97
3	Supply Chain Management	SCM	M.S.	30	3	16	3.3	309	99
4	Marketing Analytics	MA	M.S.	30	3	16	3.5	310	100
5	Quantitative Finance	QF	M.S.	36	4	24	3.4	313	103
6	Accounting	ACC	M.S.	30	3	16	3.2	309	99
7	Finance	FIN	M.S.	30	3	16	3.4	312	105
8	Full Time Management Studies	FTMBA	M.B.A.	54	4	24	3.5	320	108
9	Flex Management Studies	FLMBA	M.B.A.	36	4	24	3.5	315	105
10	Executive Management Studies	EXMBA	M.B.A.	30	3	16	3.5	320	108

PHYSICAL DATABASE DESIGN

CREATE Table statement for Faculty:

```
CREATE TABLE [SmithSchoolRanking.Faculty] (
facultyID CHAR (2) NOT NULL,
facultyName VARCHAR(600),
facultyFName VARCHAR(600),
facultyLName VARCHAR(600),
facultyTitle VARCHAR(600),
facultyQualification VARCHAR(600),
facultyDOJ CHAR(4),
facultyEmpDurationInYears INT,
facultyEmail VARCHAR(500),
    CONSTRAINT pk_facultyID PRIMARY KEY (facultyID)
);
```

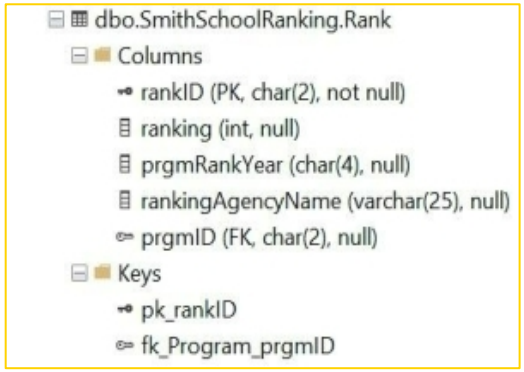


	Faculty Name	Faculty Title	Faculty Qualification	Faculty Year of Joining	Faculty Employment Duration (in Years)	Faculty Email
1	John Bono	Associate Clinical Professor of Information Systems	Ph.D., Information Systems	2019	4	jbono@umd.edu
2	Tejwansh (Tej) Singh Anand	Academic Director, MS in Information Systems	Ed.D.	2021	2	tejanand@umd.edu
3	Sujin Kim	Associate Clinical Professor	Ph.D. in Operations Research and Information Eng...	2016	7	kimsj22@umd.edu
4	Woei-Jyh (Adam) Lee	Associate Clinical Professor	Ph.D. Bioinformatics	2012	11	adamlee@umd.edu
5	Kislaya Prasad	Academic Director, Center for Global Business	Ph. D in Economics	2005	18	kprasad@umd.edu
6	Ilya Ryzhov	Area Chair, Decision, Operations and Information Te...	Ph.D. in Operations Research and Financial Engin...	2011	12	iryzhov@umd.edu
7	S. Raghu Raghavan	Dean's Professor of Management Science and Oper...	Ph.D. in Operations Research	NULL	NULL	raghavan@umd.edu
8	Siva Viswanathan	Deans Professor of Information Systems	Ph.D. Information Systems	2001	22	sviswan1@umd.edu

PHYSICAL DATABASE DESIGN

CREATE Table statement for Rank:

```
CREATE TABLE [SmithSchoolRanking.Rank] (
rankID CHAR (2) NOT NULL,
ranking INT,
prgmRankYear CHAR (4),
rankingAgencyName VARCHAR (25),
prgmID CHAR (2)
    CONSTRAINT pk_rankID PRIMARY KEY (rankID),
    CONSTRAINT fk_Program_prgmID FOREIGN KEY (prgmID)
        REFERENCES [SmithSchoolRanking.Program] (prgmID)
        ON DELETE CASCADE
        ON UPDATE NO ACTION
);
```

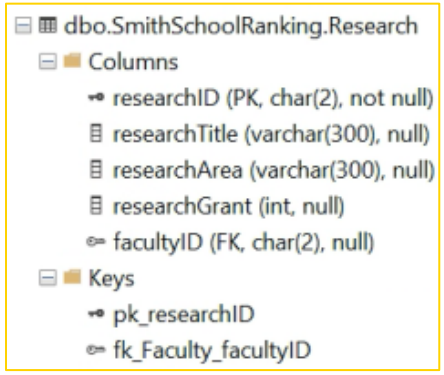


	Ranking	Ranking Year	Ranking Agency	Proram ID
1	11	2023	US News	01
2	31	2022	QS	02
3	28	2023	Top Universities	03
4	6	2017	College Factual	04
5	20	2022	Quantnet	05
6	30	2022	College Factual	06
7	2	2022	Financial Times	07
8	31	2018	Financial Times	08
9	12	2022	US News	09
10	12	2023	US News	10

PHYSICAL DATABASE DESIGN

CREATE Table statement for Research:

```
CREATE TABLE [SmithSchoolRanking.Research](
researchID CHAR (2) NOT NULL,
researchTitle VARCHAR(300),
researchArea VARCHAR(300),
researchGrant INT,
facultyID CHAR (2),
    CONSTRAINT pk_researchID PRIMARY KEY (researchID),
    CONSTRAINT fk_Faculty_facultyID FOREIGN KEY(facultyID)
        REFERENCES [SmithSchoolRanking.Faculty](facultyID)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION
);
```

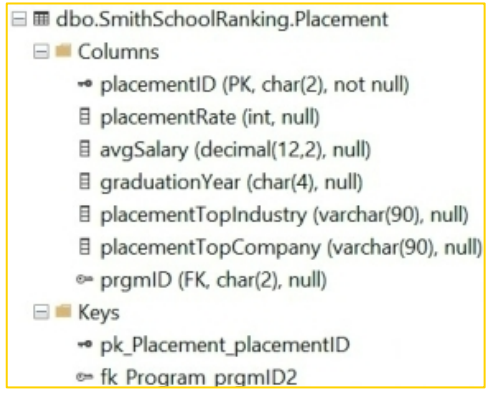


	Research Title	Research Area	Research Grant Amount (in US$)	Faculty ID
1	Mapping the Cocaine Supply Chain	Supply Chain	$ 150,000	10
2	Smith Researchers Address Liver Transplant Geogr...	Manufacturing & Service Operations Management	$ 360,000	10
3	Bringing the Industry to Smith	Information Systems	$ 11,000	01
4	Restoring America's Competitive Edge	U.S. Department of Education	$ 1,520,000	05
5	Collaborative Research: Incentives in the Workplace	National Science Foundation	$ 679,000	05
6	Optimal Learning Framework for Post-Seismic Regio...	Seismic Earthquake Detection	$ 161,000	06
7	Responsible AI: The Adoption of AI in Retail Product...	Artificial Intelligence	$ 150,000	35
8	Detecting and Mitigating Toxic Content in Online Plat...	Artificial Intelligence	$ 130,000	21

PHYSICAL DATABASE DESIGN

CREATE Table statement for Placement:

```
CREATE TABLE [SmithSchoolRanking.Placement] (
placementID CHAR (2) NOT NULL,
placementRate INT,
avgSalary DECIMAL (12,2),
graduationYear CHAR (4),
placementTopIndustry VARCHAR (90),
placementTopCompany VARCHAR (90),
prgmID CHAR (2),
    CONSTRAINT pk_Placement_placementID PRIMARY KEY (placementID),
    CONSTRAINT fk_Program_prgmID2 FOREIGN KEY (prgmID)
        REFERENCES [SmithSchoolRanking.Program] (prgmID)
        ON DELETE CASCADE
        ON UPDATE CASCADE
);
```

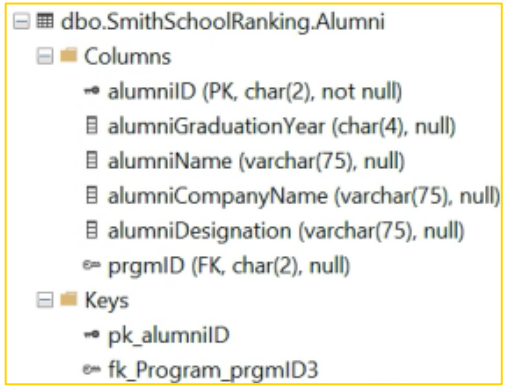


	Placement Rate	Average Salary (in US$)	Graduation Year	Placement Top Industry	Placement Top Company	Program ID
1	95	$ 83,000	2022	Internet & Cloud Computing	Google	01
2	85	$ 83,000	2022	Financial Services	CapitalOne	02
3	90	$ 77,000	2022	Hospitality Service Provider	Marriott International	03
4	80	$ 78,780	2022	Social Networking	Facebook	04
5	89	$ 85,000	2022	Financial Services	Citi	05
6	78	$ 66,000	2022	Audit, Tax and Advisory Services	KPMG	06
7	75	$ 83,000	2022	Financial Services	Morgan Stanley	07
8	93	$ 121,103	2022	Consulting	Deloitte	08

PHYSICAL DATABASE DESIGN

CREATE Table statement for Alumni:

```
CREATE TABLE [SmithSchoolRanking.Alumni] (
alumniID CHAR (2) NOT NULL,
alumniGraduationYear CHAR (4),
alumniName VARCHAR (75),
alumniCompanyName VARCHAR (75),
alumniDesignation VARCHAR (75),
prgmID CHAR (2),
    CONSTRAINT pk_alumniID PRIMARY KEY (alumniID),
    CONSTRAINT fk_Program_prgmID3 FOREIGN KEY (prgmID)
        REFERENCES [SmithSchoolRanking.Program] (prgmID)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION
);
```

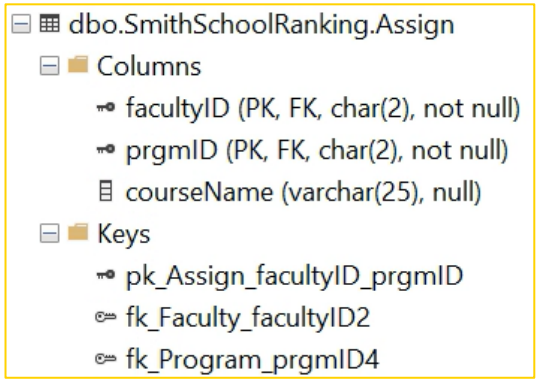


	Alumni Name	Alumni Graduation Year	Alumni Company Name	Alumni Designation	Program ID
1	Robert H. Smith	1950	JBG Smith	Real Estate Developer	01
2	Leo Van Munching	1950	Heineken	CEO	08
3	Allen J. Krowe	1954	IBM	CEO	08
4	Ed Snider	1955	Comcast	Chairman	06
5	William Mayer	1966	Credit Suisse	CEO	08
6	Michale J. Ward	1972	CSX Corporation	CEO	08
7	Carly Fiorina	1980	Hewlett-Packard	CEO	10
8	Rob McGovern	1983	Career Builder	Founder	10

PHYSICAL DATABASE DESIGN

CREATE Table statement for Assign:

```
CREATE TABLE [SmithSchoolRanking.Assign] (
facultyID CHAR (2) NOT NULL,
prgmID CHAR (2) NOT NULL,
courseName VARCHAR (25)
    CONSTRAINT pk_Assign_facultyID_prgmID PRIMARY KEY (facultyID, prgmID),
    CONSTRAINT fk_Faculty_facultyID2 FOREIGN KEY (facultyID)
        REFERENCES [SmithSchoolRanking.Faculty] (facultyID)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION,
    CONSTRAINT fk_Program_prgmID4 FOREIGN KEY (prgmID)
        REFERENCES [SmithSchoolRanking.Program] (prgmID)
        ON DELETE CASCADE
        ON UPDATE NO ACTION
);
```



	Course Name	Faculty ID	Program ID
1	BUDT704	01	01
2	BUDT721	02	01
3	BUDT731	03	02
4	BUDT702	04	01
5	BUDT702	04	02
6	BUSM761	05	08
7	BUDT723	07	01
8	BUSM750	07	08

BUSINESS TRANSACTIONS

Which is the highest ranking earned by each program at the Robert H. Smith School of Business ? Also specify the year in which the highest ranking was achieved.

```sql
SELECT p.prgmName AS 'Program Name', r.prgmRankYear AS 'Program Ranking Year', r.ranking AS 'Highest Ranking Achieved'
FROM [SmithSchoolRanking.Program] p INNER JOIN [SmithSchoolRanking.Rank] r ON p.prgmId = r.prgmId
INNER JOIN (
  SELECT prgmId, MIN(ranking) AS highest_rank
  FROM [SmithSchoolRanking.Rank]
  GROUP BY prgmId
) highest_ranking
ON r.prgmId = highest_ranking.prgmId AND r.ranking = highest_ranking.highest_rank
ORDER BY r.ranking;
```

	Program Name	Program Ranking Year	Highest Ranking Achieved
1	Finance	2022	2
2	Marketing Analytics	2017	6
3	Information Systems	2021	7
4	Flex Management Studies	2022	12
5	Executive Management Studies	2023	12
6	Quantitative Finance	2022	20
7	Full Time Management Studies	2022	24
8	Supply Chain Management	2022	26
9	Accounting	2022	30
10	Business Analytics	2022	31

BUSINESS TRANSACTIONS

Who are the faculty members with top 3 research grants? Specify all the details of the faculty along with the grant amounts in descending order.

```
SELECT TOP 3 f.facultyName AS 'Faculty Name', f.facultyTitle AS 'Faculty Title', f.facultyQualification AS 'Qualification', re.researchTitle AS 'Research Title'
re.researchArea AS 'Area of Interest', '$ ' + FORMAT(re.researchGrant, '###,###,###.##') AS [Research Grant Amount (in US$)]
FROM [SmithSchoolRanking.Faculty] f INNER JOIN [SmithSchoolRanking.Research] re
ON f.facultyID = re.researchID
ORDER BY re.researchGrant DESC;
```

	Faculty Name	Faculty Title	Qualification	Research Title	Area of Interest	Research Grant Amount (in US$)
1	Woei-jyh (Adam) Lee	Associate Clinical Professor	Ph.D. Bioinformatics	Restoring America's Competitive Edge	U.S. Department of Education	$ 1,520,000
2	Kislaya Prasad	Academic Director, Center for Global Business	Ph. D in Economics	Collaborative Research: Incentives in the Workplace	National Science Foundation	$ 679,000
3	Tejwansh (Tej) Singh Anand	Academic Director, MS in Information Systems	Ed.D.	Smith Researchers Address Liver Transplant Geogr...	Manufacturing & Service Operations Management	$ 360,000

BUSINESS TRANSACTIONS

For the year 2022, which program had the best placement record, and what was the rank achieved corresponding to the program ?

```
SELECT TOP 1 p.prgmName AS 'Program Name', r.ranking AS 'Program Rank', pl.placementRate AS 'Placement Rate (in %)'
FROM [SmithSchoolRanking.Program] p INNER JOIN [SmithSchoolRanking.Placement] pl
ON p.prgmID = pl.prgmID INNER JOIN [SmithSchoolRanking.Rank] r
ON r.prgmID = pl.prgmID
WHERE YEAR(r.prgmRankYear) = 2022
ORDER BY pl.placementRate DESC;
```

	Program Name	Program Rank	Placement Rate (in %)
1	Full Time Management Studies	24	93

BUSINESS TRANSACTIONS

What are the details of the faculty members of the top-ranked program the current year (i.e., 2023)? Also display the courses being taught by the respective faculty.

```
SELECT f.facultyName AS 'Faculty Name', f.facultyDOJ AS 'Faculty Date of Joining',
f.facultyEmpDurationInYears AS 'Faculty Employment Duration (in years)',
f.facultyQualification AS 'Faculty Qualification', a.courseName AS 'Course Name'
FROM [SmithSchoolRanking.Faculty] f INNER JOIN [SmithSchoolRanking.Assign] a
ON f.facultyID = a.facultyID INNER JOIN [SmithSchoolRanking.Rank] r ON a.prgmID = r.prgmID
WHERE r.ranking IN (
    SELECT MIN(ranking)
    FROM [SmithSchoolRanking.Rank]
    WHERE prgmRankYear = YEAR(GETDATE())
    )
ORDER BY f.facultyDOJ DESC;
```

	Faculty Name	Faculty Date of Joining	Faculty Employment Duration (in years)	Faculty Qualification	Course Name
1	Tejwansh (Tej) Singh Anand	2021	2	Ed.D.	BUDT721
2	John Bono	2019	4	Ph.D., Information Systems	BUDT704
3	Jessica Clark	2017	6	Ph.D. in Information Systems	BUDT733
4	Woei-jyh (Adam) Lee	2012	11	Ph.D. Bioinformatics	BUDT702
5	S. Raghu Raghavan	NULL	NULL	Ph.D. in Operations Research	BUDT723

BUSINESS TRANSACTIONS

Create a view - For the currently top 2 ranked programs, what are the average GRE and TOEFL score requirements ?

```
GO
DROP VIEW IF EXISTS ExamScoresView
GO
CREATE VIEW ExamScoresView AS
SELECT TOP 2 p.prgmName AS 'Program Name', p.prgmAvgGREReq AS 'GRE Requirements', p.prgmAvgTOFELReq AS 'TOEFL Requiremnts'
FROM [SmithSchoolRanking.Rank] r INNER JOIN [SmithSchoolRanking.Program] p
ON r.prgmID = p.prgmID
WHERE r.prgmRankYear = 2023
ORDER BY r.ranking ASC;
GO
SELECT *
FROM ExamScoresView;
```

	Program Name	GRE Requirements	TOEFL Requiremnts
1	Information Systems	310	100
2	Executive Management Studies	320	108

BUSINESS TRANSACTIONS

Create a view - Who are the alumni of the program that has achieved the highest ranking in 2023. What have they achieved ?

```
GO
DROP VIEW IF EXISTS AlumniInfoView
GO
CREATE VIEW AlumniInfoView AS
SELECT a.alumniName AS 'Alumni Name', a.alumniGraduationYear AS 'Alumni Graduation Year', p.prgmName AS 'Program Name',
a.alumniCompanyName AS 'Alumni Company Name', a.alumniDesignation AS 'Alumni Designation'
FROM [SmithSchoolRanking.Alumni] a INNER JOIN [SmithSchoolRanking.Rank] r
ON a.prgmID = r.prgmID INNER JOIN [SmithSchoolRanking.Program] p
ON a.prgmID = p.prgmID
WHERE r.ranking IN (
    SELECT MIN(ranking)
    FROM [SmithSchoolRanking.Rank]
    WHERE prgmRankYear = 2023
)
GO
SELECT *
FROM AlumniInfoView;
```

	Alumni Name	Alumni Graduation Year	Program Name	Alumni Company Name	Alumni Designation
1	Robert H. Smith	1950	Information Systems	JBG Smith	Real Estate Developer
2	Beatriz Perez	1991	Information Systems	Coca-Cola	CSO
3	Nihal Poipatla	2020	Information Systems	Abercrombie and Fitch	Customer Intelligence Analyst
4	Varun Goenka	2020	Information Systems	TruStage	Data Analyst IV
5	John Malone	2015	Information Systems	UMD Smith School of Business	Assistant Director
6	Humza Malik	2020	Information Systems	SC&H Group	Senior Consultant
7	Aniket Datar	2020	Information Systems	PwC	Senior Associate
8	Priya Ashok	2019	Information Systems	Morgan Stanley	Associate
9	Megha Komarr...	2020	Information Systems	NICE CXone	Implementation Analyst

THANK YOU

Please let us know if you have any questions.