MSBA and MBA Program Choices by TurboRank Inc.

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TEAM BUDT703_0507_04

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Background

- **Users:**
  - Prospective students
  - Dean of MSBA/MBA programs across U.S. institutions
  - Researchers

- **Data Sources:**
  - University websites
  - **Ranking institution websites:**
    -Bloomberg
    - QS World University Rankings
    -TFE TIMES

Mission Statement

- To help prospective students who intend to take MSBA/MBA in the USA to choose the most suitable program(s) based on their needs (e.g. rankings, tuition, test score etc.)

- To help deans of MSBA/MBA in the U.S. universities to know about the overall situation of the program, especially the rankings of the program and related factors influences the rankings

- To help researchers who conduct related research to get the information of the MSBA/MBA programs in the U.S. universities quickly

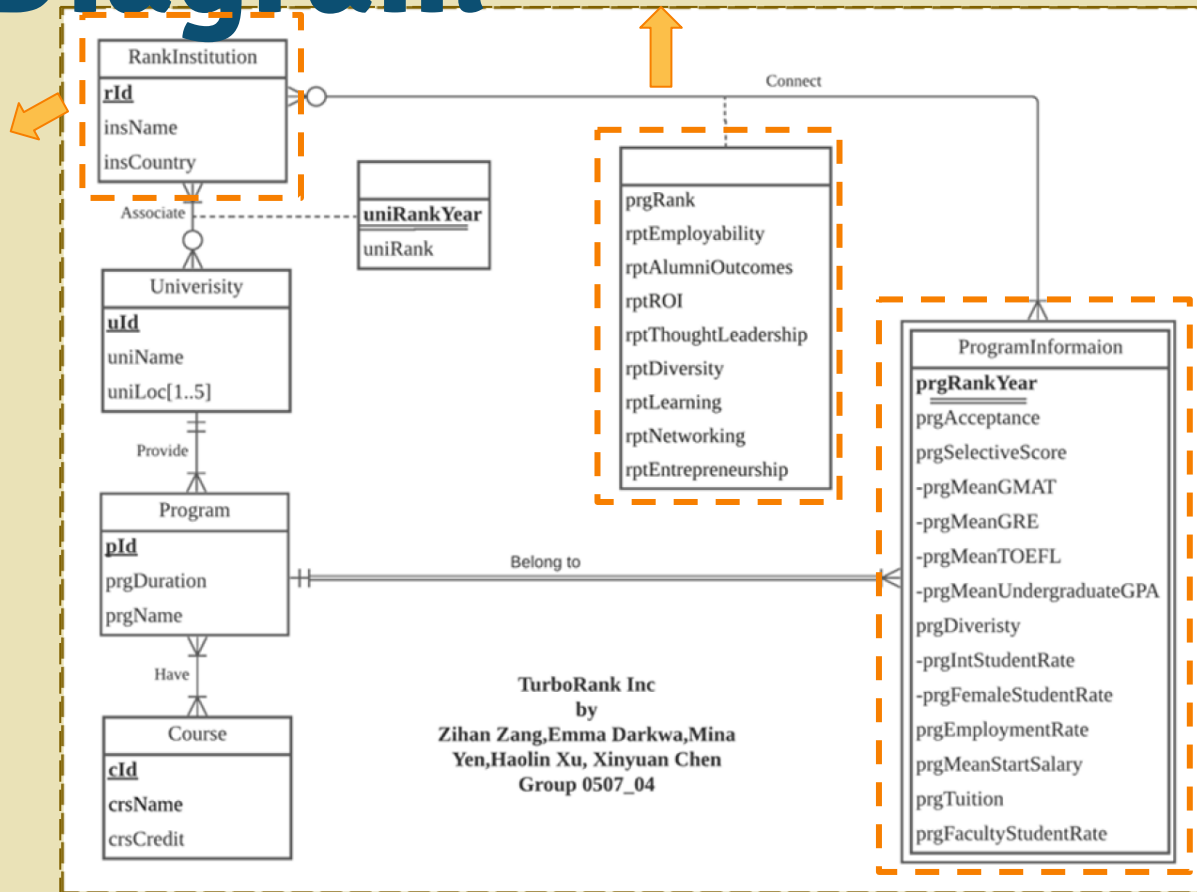# Mission Objectives Turned Into Business Transactions

- What are the different institutions that rank Robert H. Smith MSBA program through the years ?
- Which MSBA programs has an alumni outcome with 100% of alumni being responsive and involved?
- What are the different rankings for MSBA programs with the top 4 employment rate?
- Which university has a higher score of diversity?
- What are the MSBA programs with mean Gmat score less than or equal to 700 and mean undergraduate GPA less than or equal to 3.5?
- What are the details of the top five MBA programs in each ranking source in 2021?
- What are the scores of selective students of the MSBA program and the corresponding program ranking in QS?
- What is the number of core courses that each program provides and how many credits of these courses in total?
- Which MSBA programs provide the data mining course?
- What are the top ten programs with the highest international student rate?
- What are the program and its university 2021 QS ranking of all programs that are more than 18 months?
- Which program's average undergraduate GPA is not more than 3.5 in 2021, and its TOEFL, GRE requirement?
- What is the program information of the highest ROI MBA program?
- What are the average tuition,starting salary and ROI score of QS World University Ranking for MBA in descending order?
- What is the mean starting salary and tuition for MSBA in ascending order?

ER Diagram

↑Rank	↓University	‹	↓Overall Score	↓Value for Money	↓Thought Leadership	↓Employability	↓Diversity	↓Alumni Outcome
1	MIT (Sloan);Master of Business Analytics ◎ Cambridge (MA)		94.9	95.6	100	98.9	60.7	100

TFE Times

QS TOPUNIVERSITIES

Bloomberg

RankInstitution
- <u>rId</u>
- insName
- insCountry

Associate

uniRankYear
- <u>uniRankYear</u>
- uniRank

Univerisity
- <u>uId</u>
- uniName
- uniLoc[1..5]

Provide

Program
- <u>pId</u>
- prgDuration
- prgName

Have

Course
- <u>cId</u>
- crsName
- crsCredit

Connect

- prgRank
- rptEmployability
- rptAlumniOutcomes
- rptROI
- rptThoughtLeadership
- rptDiversity
- rptLearning
- rptNetworking
- rptEntrepreneurship

Belong to

ProgramInformaion
- <u>prgRankYear</u>
- prgAcceptance
- prgSelectiveScore
- -prgMeanGMAT
- -prgMeanGRE
- -prgMeanTOEFL
- -prgMeanUndergraduateGPA
- prgDiveristy
- -prgIntStudentRate
- -prgFemaleStudentRate
- prgEmploymentRate
- prgMeanStartSalary
- prgTuition
- prgFacultyStudentRate

TurboRank Inc
by
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Group 0507_04

Emory

👥 **Class Size**
54 students

🧑‍💼 **Average Work Experience**
3 years

👩 **Women**
48%

👥 **Student to Faculty Ratio**
4:1

🏛 **GMAT (80%) Range**
700-750

🌐 **International**
75%

Relation

- RankInstitution (**rId**, insName, insCountry)

- University (**uId**, uniName)

- UniversityLoc (**uniLoc**, *uId*)

- Program (**pId**, *uId*, prgDuration, prgName)

- Course (**cId**, crsName, crsCredit)

- ProgramInformation (**prgRankYear**, *pId*, prgAcceptance, prgMeanGMAT, prgMeanGRE, prgMeanTOEFL, prgMeanUndergradGPA, prgIntStudentRate, prgFemaleStudentRate, prgEmploymentRate, prgMeanStartSalary, prgTuition, prgFacultyStudentRate)

- Associate (**uniRankYear**, *uId*, *rId*, uniRank)

- Have (*pId*, *cId*)

- Connect (*rId*, *pId*, **prgRankYear**, prgRank, rptEmployability, rptAlumniOutcomes, rptROI, rptThoughtLeadership, rptDiversity, rptLearning, rptNetworking, rptEntrepreneurship)

Create Table

```sql
CREATE TABLE[TurboRank.ProgramInformation](
    pId CHAR(3) NOT NULL,
    prgRankYear CHAR (4) NOT NULL,
    prgAcceptance DECIMAL (4,3),
    prgMeanGMAT DECIMAL (5,2),
    prgMeanGRE DECIMAL (5,2),
    prgMeanTOEFL DECIMAL (5,2),
    prgMeanUndergradGPA DECIMAL(3,2),
    prgIntStudentRate DECIMAL (4,3),
    prgFemaleStudentRate DECIMAL (4,3),
    prgEmploymentRate DECIMAL (4,3),
    prgMeanStartSalary DECIMAL (9,2),
    prgTuition DECIMAL (9,2),
    prgFacultyStudentRate DECIMAL (4,3),
    CONSTRAINT pk_ProgramInformation_pId_rankYear PRIMARY KEY (pId, prgRankYear),
    CONSTRAINT fk_ProgramInformation_pId FOREIGN KEY (pId)
        REFERENCES [TurboRank.Program] (pId)
        ON DELETE CASCADE ON UPDATE CASCADE
)
```

ProgramInformaion
prgRankYear
prgAcceptance
prgSelectiveScore
-prgMeanGMAT
-prgMeanGRE
-prgMeanTOEFL
-prgMeanUndergraduateGPA
prgDiveristy
-prgIntStudentRate
-prgFemaleStudentRate
prgEmploymentRate
prgMeanStartSalary
prgTuition
prgFacultyStudentRate

Create Table

pId	prgRankYear	prgAcceptance	prgMeanGMAT	prgMeanGRE	prgMeanTOEFL	prgMeanUndergradGPA	prgIntStudentRate	prgFemaleStudentRate	prgEmploymentRate
p01	2021	NULL	639.00	309.00	NULL	3.40	NULL	0.460	0.700
p02	2019	NULL	NULL	NULL	NULL	3.26	0.319	0.430	0.870
p02	2020	0.458	NULL	310.00	NULL	3.24	NULL	0.410	0.880
p02	2021	0.458	660.00	NULL	NULL	3.30	0.300	0.460	NULL
p03	2019	0.420	687.00	NULL	NULL	3.30	0.350	0.330	0.937
p03	2020	0.270	680.00	321.00	NULL	3.30	0.280	0.250	0.940
p03	2021	0.277	691.00	NULL	NULL	3.35	0.340	0.210	0.957
p04	2019	0.380	696.00	NULL	NULL	3.41	0.320	0.350	0.940
p04	2020	0.400	700.00	321.00	NULL	3.41	0.270	0.330	0.930
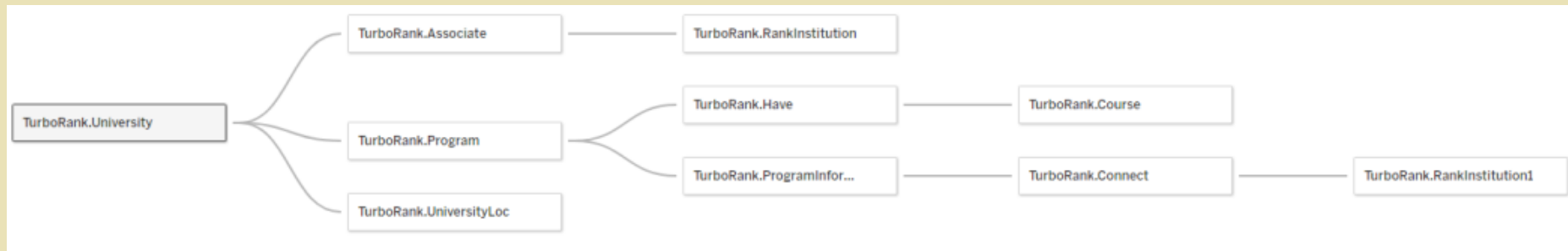
Drop Table

```sql
DROP TABLE IF EXISTS [TurboRank.Connect];

DROP TABLE IF EXISTS [TurboRank.Associate];

DROP TABLE IF EXISTS [TurboRank.Have];

DROP TABLE IF EXISTS [TurboRank.Course];

DROP TABLE IF EXISTS [TurboRank.ProgramInformation];

DROP TABLE IF EXISTS [TurboRank.Program];

DROP TABLE IF EXISTS [TurboRank.UniversityLoc];

DROP TABLE IF EXISTS [TurboRank.University];

DROP TABLE IF EXISTS [TurboRank.RankInstitution];
```

Create Table

```
CREATE TABLE [TurboRank.RankInstitution] (
        rId CHAR(3) NOT NULL,
        insName VARCHAR (30),
        insCountry VARCHAR (20),
        CONSTRAINT pk_RankInstitution_rId PRIMARY KEY (rId)
        )


CREATE TABLE [TurboRank.University](
        uId CHAR(3) NOT NULL,
        uniName VARCHAR (60),
        CONSTRAINT pk_University_uId PRIMARY KEY (uId)
        )


CREATE TABLE [TurboRank.UniversityLoc] (
        uId CHAR(3) NOT NULL,
        uniLoc VARCHAR (20),
        CONSTRAINT pk_UniversityLoc_uId_uniLoc PRIMARY KEY
(uId,uniLoc),
        CONSTRAINT fk_UniversityLoc_uId FOREIGN KEY (uId)
                REFERENCES [TurboRank.University] (uId)
                ON DELETE CASCADE ON UPDATE CASCADE
        )
```

RankInstitution
rId
insName
insCountry

Univerisity
uId
uniName
uniLoc[1..5]

Create Table

CREATE TABLE [TurboRank.Program] (
    pId CHAR(3) NOT NULL,
    uId CHAR(3) NOT NULL,
    prgDuration DECIMAL (3,1),
    prgName VARCHAR(60) NOT NULL,
    CONSTRAINT pk_Program_pId PRIMARY KEY (pId),
    CONSTRAINT fk_Program_uId FOREIGN KEY (uId)
        REFERENCES [TurboRank.University] (uId)
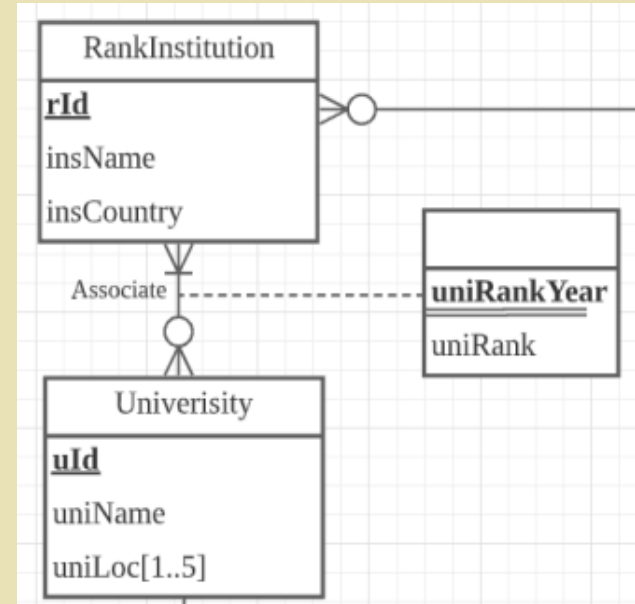   ON DELETE CASCADE ON UPDATE CASCADE
)

CREATE TABLE [TurboRank.Have] (
    pId CHAR(3) NOT NULL,
    cId CHAR(4) NOT NULL,
    CONSTRAINT pk_Have_pId_cId PRIMARY KEY (pId, cId),
    CONSTRAINT fk_Have_cId FOREIGN KEY (cId)
        REFERENCES [TurboRank.Course] (cId)
        ON DELETE CASCADE ON UPDATE CASCADE,
    CONSTRAINT fk_Have_pId FOREIGN KEY (pId)
        REFERENCES [TurboRank.Program] (pId)
        ON DELETE CASCADE ON UPDATE CASCADE
)

CREATE TABLE [TurboRank.Course] (
    cId CHAR(4) NOT NULL,
    crsName VARCHAR (100),
    crsCredit DECIMAL (3,1),
    CONSTRAINT pk_Course_cId PRIMARY KEY (cId)
)
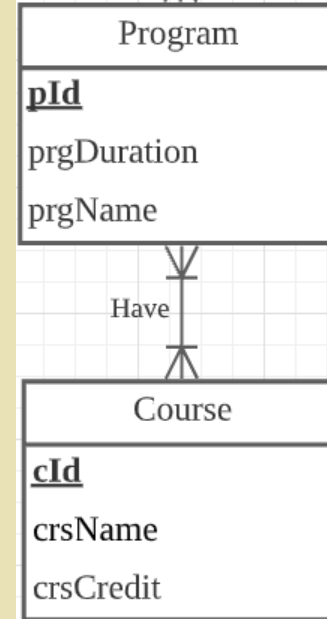
Create Table

CREATE TABLE [TurboRank.Associate] (
        uId CHAR(3) NOT NULL,
        rId CHAR(3) NOT NULL,
        uniRankYear CHAR(4) NOT NULL,
        uniRank VARCHAR (7),
        CONSTRAINT pk_Associate_uId PRIMARY KEY (uId, rId, uniRankYear),
        CONSTRAINT fk_Associate_uId FOREIGN KEY (uId)
                REFERENCES [TurboRank.University] (uId)
                ON DELETE NO ACTION ON UPDATE CASCADE,
        CONSTRAINT fk_Associate_rId FOREIGN KEY (rId)
                REFERENCES [TurboRank.RankInstitution] (rId)
                ON DELETE NO ACTION ON UPDATE CASCADE
)

Create Table

```sql
CREATE TABLE [TurboRank.Connect] (
        rId CHAR(3) NOT NULL,
        pId CHAR(3) NOT NULL,
        prgRankYear CHAR(4) NOT NULL,
        prgRank VARCHAR(4),
        rptEmployability DECIMAL (5,2),
        rptAlumniOutcomes DECIMAL (5,2),
        rptROI DECIMAL (5,2),
        rptThoughtLeadership DECIMAL (5,2),
        rptDiversity DECIMAL (5,2),
        rptLearning DECIMAL (5,2),
        rptNetworking DECIMAL (5,2),
        rptEntrepreneurship DECIMAL (5,2),
        CONSTRAINT pk_Connect_rId_pId_prgRankyear PRIMARY KEY (rId, pId,
prgRankYear),
        CONSTRAINT fk_Connect_rId FOREIGN KEY (rId)
                REFERENCES [TurboRank.RankInstitution] (rId)
                ON DELETE NO ACTION ON UPDATE CASCADE,
        CONSTRAINT fk_Connect_pId_prgRankYear FOREIGN KEY (pId,prgRankYear)
                REFERENCES [TurboRank.ProgramInformation] (pId, prgRankYear)
                ON DELETE NO ACTION ON UPDATE CASCADE        )
```


Connect

prgRank
rptEmployability
rptAlumniOutcomes
rptROI
rptThoughtLeadership
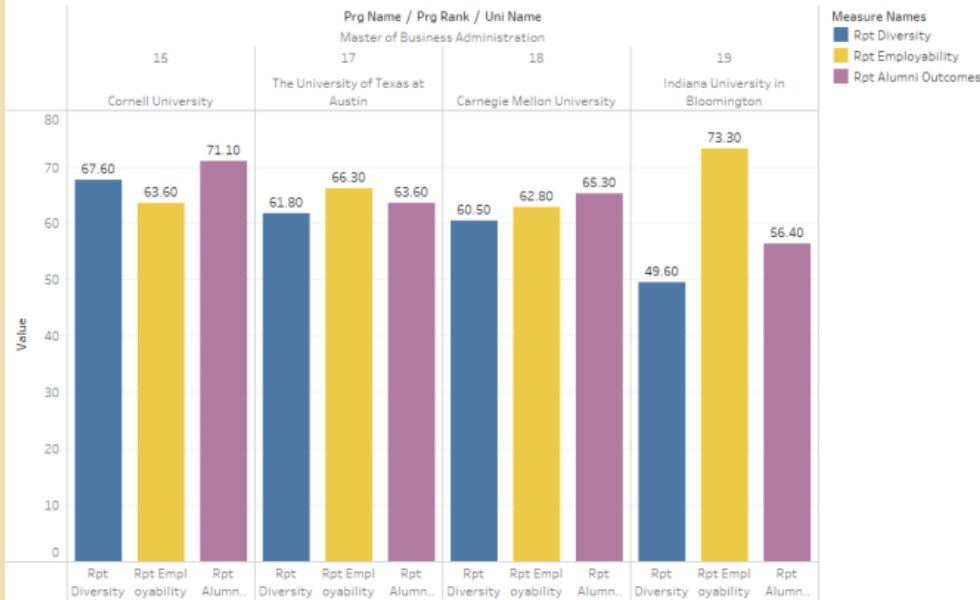rptDiversity
rptLearning
rptNetworking
rptEntrepreneurship

Business Transactions(1) ...nts

```sql
SELECT DISTINCT TOP(4) u.uniName, p.prgName, c.prgRank, c.rptDiversity, c.rptEmployability, c.rptAlumniOutcomes
FROM [TurboRank.University] u, [TurboRank.Program] p, [TurboRank.Connect] c, [TurboRank.RankInstitution] r
WHERE u.uId = p.uId AND p.pId = c.pId AND c.prgRankYear = 2021 AND r.rId = 'r01' AND r.rId=c.rId
    AND (p.prgName LIKE '%Administration%')
ORDER BY c.prgRank
```

Results | Messages

uniName	prgName	prgRank	rptDiversity	rptEmployability	rptAlumniOutcomes
Cornell University	Master of Business Administration	15	67.60	63.60	71.10
The University of Texas at Austin	Master of Business Administration	17	61.80	66.30	63.60
Carnegie Mellon University	Master of Business Administration	18	60.50	62.80	65.30
Indiana University in Bloomington	Master of Business Administration	19	49.60	73.30	56.40

For Prospective International Students Seeking Career After Studying MBA

- **Top 4 MBA QS ranking 2021**
- **Diversity / Employability / Alumni Outcome Scores**

What is the Diversity/Employability/AlumniOutcome scores of top 4 ranking MBA programs from QS in 2021?

Business Transactions(2)

```sql
SELECT DISTINCT TOP (10) u.uniName, p.prgName, AVG(i.prgTuition) AS 'Average tuition',
        AVG(i.prgMeanStartSalary) AS 'Average starting salary', AVG(c.rptROI) AS 'Average ROI'
FROM [TurboRank.University] u, [TurboRank.Program] p, [TurboRank.ProgramInformation] i,[TurboRank.Connect] c
WHERE u.uId = p.uId
    AND p.pId = i.pId
    AND p.pId = c.pId
    AND P.prgName = 'Master of Business Administration'
GROUP BY p.uId,p.pId, u.uniName, p.prgName
ORDER BY AVG(i.prgTuition) DESC
```

Results | Messages

uniName	prgName	Average tuition	Average starting salary	Average ROI
Carnegie Mellon University	Master of Business Administration	144525.000000	131635.000000	92.433333
Cornell University	Master of Business Administration	132809.333333	133689.000000	85.433333
Rice University	Master of Business Administration	124539.000000	125015.333333	76.833333
Vanderbilt University	Master of Business Administration	123500.000000	122009.000000	81.266666
University of Florida	Master of Business Administration	122520.000000	109500.000000	88.400000
The University of Texas at Austin	Master of Business Administration	113381.333333	127390.666666	85.633333
University of Maryland	Master of Business Administration	113292.000000	106707.666666	60.933333

What is the average tuition,starting salary and ROI score of QS World University Ranking for MBA in descending order?
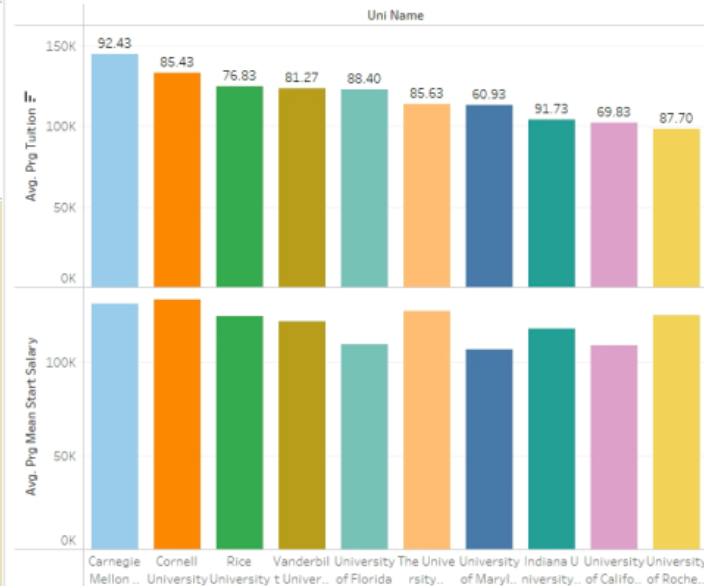
Generally, tuition and starting salary are positively correlated.

A Programs

```
SELECT  b.[TOP 4 Employmentrate],b.prgName,b.uniName,f.uId,f.uniRank
FROM(
    SELECT TOP(4) i.prgEmploymentRate AS 'TOP 4 Employmentrate',p.prgName,u.uniName,u.uId
    FROM [TurboRank.ProgramInformation] i, [TurboRank.Program] p, [TurboRank.University] u
    WHERE i.pId=p.pId AND p.uId=u.uId  AND p.prgName LIKE '%Analytics%'
    ORDER BY i.prgEmploymentRate DESC) b,(
    SELECT a.uniRank,a.uniRankYear,a.uId
    FROM [TurboRank.Associate] a, [TurboRank.University] u
    WHERE a.uId=u.uId) f
WHERE f.uid=b.uid
```

TOP 4 Employmentrate	prgName	uniName	uId	uniRank
1.000	Master in Business Analytics	Emory University	u21	158
1.000	Master in Business Analytics	Emory University	u21	22
1.000	Master in Data Analytics & Business Computing	New York University	u30	35
1.000	Master in Data Analytics & Business Computing	New York University	u30	32
1.000	Master of Business Analytics	Massachusetts Institute of Technology	u11	1
1.000	Master of Business Analytics	Massachusetts Institute of Technology	u11	9
1.000	Master of Science in Business Analytics	University of California, Los Angeles	u12	36
1.000	Master of Science in Business Analytics	University of California, Los Angeles	u12	23

In this transaction a dean might be curious about different rankings for different programs and possibly how students can benefit employment wise after pursuing these programs

Deans of MSBA Programs

Different ranking institutions rank these programs differently but the employment rate after pursuing the program is the same.

What are different rankings for MSBA programs with the top 4 employment rate?
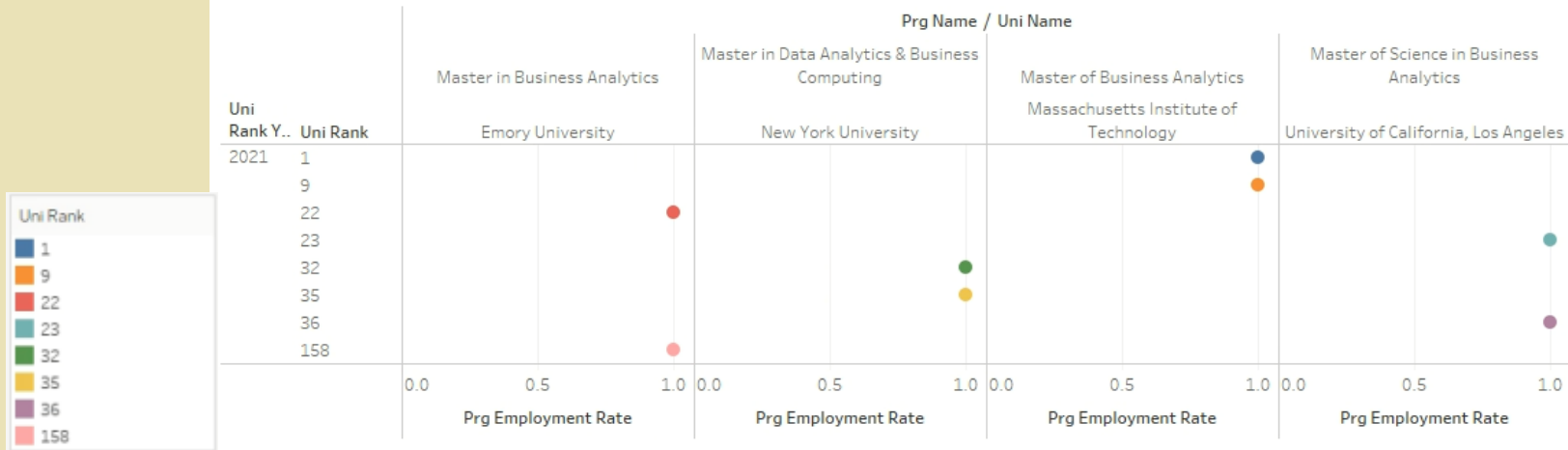
Business Transactions(4)


```sql
SELECT TOP 10 u.uniName, p.prgName, i.prgMeanGMAT, i.prgMeanUndergradGPA
FROM [TurboRank.ProgramInformation] i,[TurboRank.Program] p, [TurboRank.University] u
WHERE i.prgRankYear = '2021'
AND p.uId = u.uId
AND p.pId = i.pId
ORDER BY i.prgMeanGMAT DESC
```

Results | Messages

| uniName	prgName	prgMeanGMAT	prgMeanUndergradGPA
Emory University	Master in Business Analytics	725.00	3.60
University of Southern California	Master of Science in Business Analytics	712.00	3.70
University of California, Los Angeles	Master of Science in Business Analytics	710.00	3.75
Cornell University	Master of Business Administration	710.00	3.34
New York University	Master in Data Analytics & Business Computing	710.00	3.60
University of California, Davis	Master of Science in Business Analytics	707.00	3.40
Rice University	Master of Business Administration	705.00	3.51
The University of Texas at Austin	Master of Business Administration	704.00	3.44
The University of Texas at Austin	Master of Science in Business Analytics	704.00	3.72
University of Notre Dame	Master of Business Analytics	697.00	3.60

For Student:
High GMAT requirement not equals to high GPA requirement

For researcher:
GMAT and GPA score really have linear relationship?

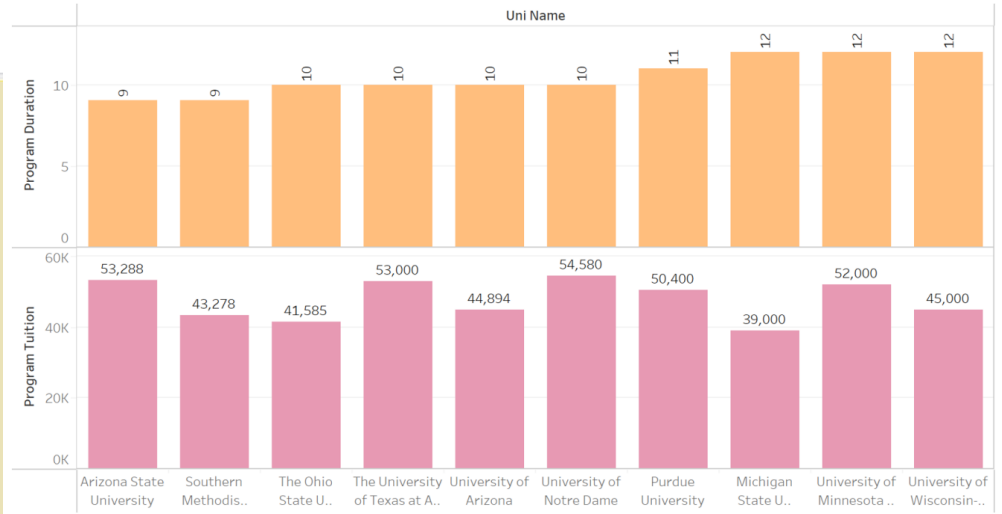What is the average undergraduate GPA of the top 10 programs with highest GMAT score in 2021?
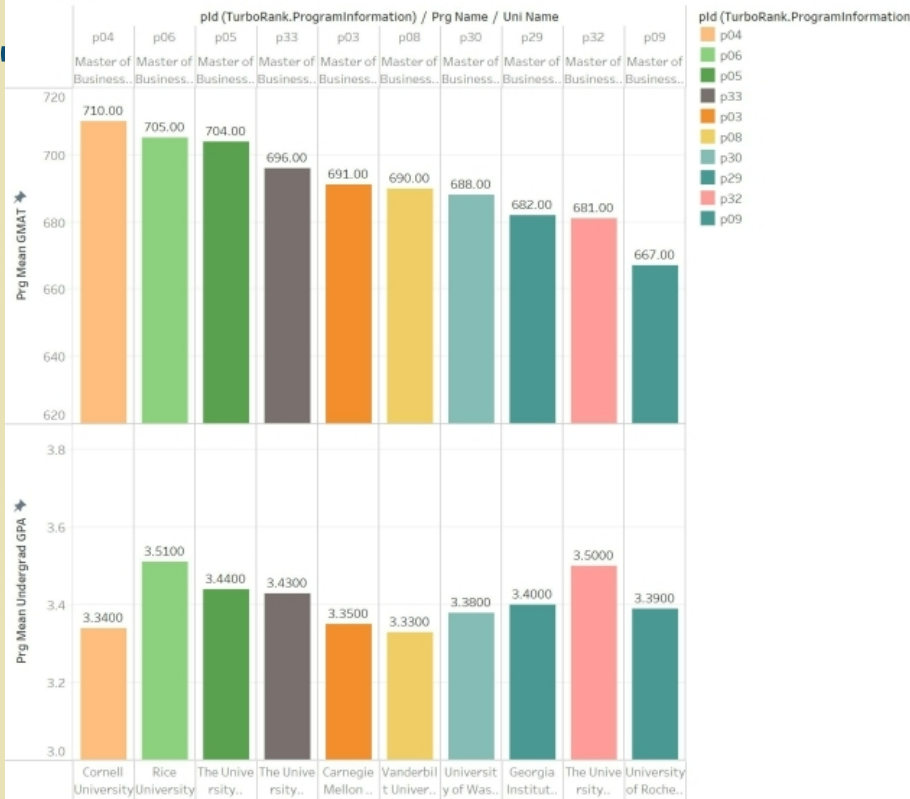
Business Transactions(5)

```sql
SELECT u.uniName, d.prgDuration AS 'Program Duration', d.prgTuition AS 'Program Tuition'
FROM (
    SELECT p.uId, p.prgDuration, i.prgTuition
    FROM [TurboRank.ProgramInformation] i, [TurboRank.Program] P
    WHERE i.pId = p.pId AND i.prgTuition <= 55000 AND p.prgName LIKE '%Analytics%' AND p.prgDuration <= 12 AND i.prgRankYear = '2021')
    [TurboRank.University] u
WHERE d.uId = u.uId
ORDER BY d.prgDuration |
```

Results Messages

uniName	Program Duration	Program Tuition
Southern Methodist University	9.0	43278.00
Arizona State University	9.0	53288.00
University of Notre Dame	10.0	54580.00
University of Arizona	10.0	44894.00
The Ohio State University	10.0	41585.00
The University of Texas at Austin	10.0	53000.00
Purdue University	11.0	50400.00

For Student:

some of them care about the total expenses they spend during the program, including living expenses and tuition. The longer the program duration lasts, the higher the living expenses are. So, for someone who wants to save money, they prefer the programs with shorter duration and cheaper tuition.
SMU or OSU can be a good choice for them.

Which universities provide a MSBA program with duration of no more than one-year and tuition of no more than $55000?

Thank You!