

Team Name: Rankbusters

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Mission Statement: Enabling an advance database solution that delivers strategic insights into program rankings, departmental performance for department heads, undergraduate students, and their parents.

Mission Objectives:

1. Finding the average of the rankings of the programs over the years for each department.
2. Determining the best performing departments in terms of rankings of their programs.
3. Identifying the years when the various sources had significant differences in the rankings of the programs.
4. Attaining the highest rankings for the programs over the years.
5. Obtaining the program levels (MBA, MS, etc.) that have the highest average rankings over the years.
6. Finding departments which offer the most programs that have been ranked in the top 10 by multiple sources.

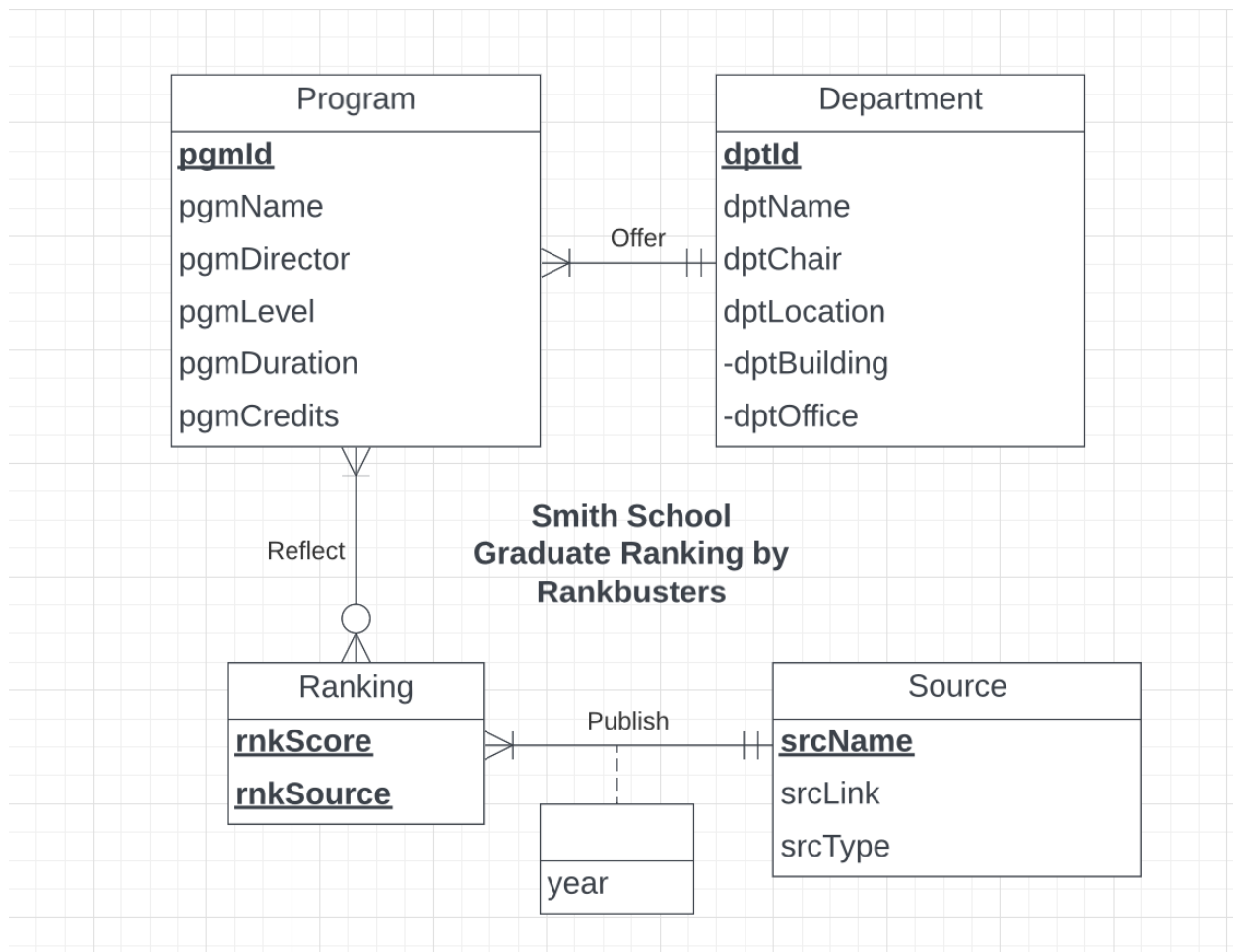
Entities, Attributes and Primary Keys

1. Department (**dptId**, dptName, dptChair, dptLocation, -dptBuilding, -dptOffice)
2. Program (**pgmId**, pgmName, pgmDirector, pgmLevel, pgmDuration, pgmCredits)
3. Source (**srcName**, srcLink, srcType)
4. Ranking (**rnkScore**, **rnkSource**)

Relationships, Attributes, Degrees, Participating Entities and Constraints

1. Offers: Binary Relationship
 - 1 Department to 1 or more programs
 - 1 Program to 1 Department
2. Publish (year): Binary Relationship
 - 1 Source to 1 or more Rankings
 - 1 Ranking to 1 Source
3. Reflects: Binary Relationship
 - 1 Program to 0 or more Rankings # (If the program is fairly new and not has been ranked)
 - 1 Ranking to 1 or more Programs # (If multiple programs have same rank on same year.)

ER Diagram



Relations:

Department (dptId, dptName, dptChair, dptBuilding, dptOffice)

Program (pgmId, pgmName, pgmDirector, pgmLevel, pgmDuration, pgmCredits, *dptId*)

Source (srcName, srcLink, srcType)

Ranking (rnkScore, *pgmId*)

Publish (srcName, *rnkScore*, *year*)

Functional Dependencies:

pgmId → pgmName, pgmDirector, pgmLevel, pgmDuration, pgmCredits)

dptId → dptName, dptHead, dptBuilding, dptOffice

srcName → srcLink, srcType

rnkScore, rnkSource → year

Referential Integrity:

Relation	Foreign Key	Base Relation	Primary Key	Business Rule	Constraint: ON DELETE	Business Rule	Constraint: ON UPDATE
Program	dptId	Department	dptId	R2	CASCADE	R1	NO ACTION
Ranking	pgmId	Program	pgmId	R3	NO ACTION	R4	CASCADE
Publish	srcName	Source	srcName	R6	NO ACTION	R5	CASCADE
Publish	rnkScore	Ranking	rnkScore	R8	CASCADE	R7	CASCADE

Business Rule:

[R1] When the department information is changed in the database, the information of corresponding programs should remain unchanged.

[R2] If a department is removed, the program no longer exists and should be deleted.

[R3] When the information on the program is deleted from the database, the corresponding ranking information should remain unchanged.

[R4] When the information on the program is changed in the database, the corresponding ranking information should be changed too.

[R5] When the information on the source is deleted from the database, the corresponding information on the publishment of the ranking should remain unchanged.

[R6] When the information on the source is changed in the database, the corresponding information on the publishment of the ranking should be changed as well.

[R7] When the ranking information is changed in the database, the corresponding information on the publishment of the ranking should be changed as well.

[R8] When the ranking information is deleted from the database, the corresponding information on the publishment of the ranking should be deleted as well.

Sample Data:

Department (01, Decision, Operations & Information Logistics, Ilya Ryzhov, Van Munching Hall, 4340)

Program (1001, Information Systems, Tejawansh (Tej) Singh Anand, Master of Science, 1.5 years, 30, 01)

Source (QS Top Universities, <https://www.topuniversities.com/university-rankings/university-subject-rankings/2023/computer-science-information-systems?search=university%20of%20maryland>, Website)

Ranking (59, 1001)

Publish (QS Top Universities, 59, 2023)