Constraints & Triggers

Referential Integrity

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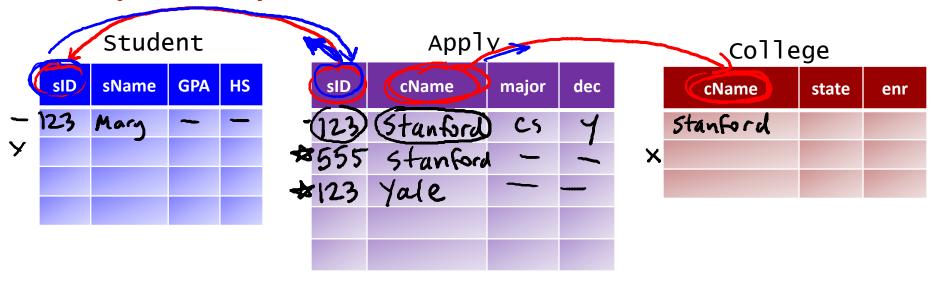
Integrity Constraints

Impose restrictions on allowable data, beyond those imposed by structure and types

Referential integrity
 = Integrity of references
 = No "dangling pointers"

Simple Example Database

Student

sID	sName	GPA	HS
123	Mary	—	—

Apply

sID	cName	major	dec
123	Stanford	Cs	Y
555	Stanford	—	—
123	Yale	—	—

College

cName	state	enr
Stanford		

Referential integrity from $R.A$ to $S.B$

Each value in column A of table R must appear in column B of table S

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Referential integrity from R.A to S.B

Each value in column A of table R must appear in column B of table S
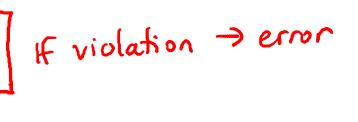
- A is called the "foreign key"   *Foreign Key constraints*

- B is usually required to be the *primary key* for table S or at least *unique*

- Multi-attribute foreign keys are allowed

Student

sID	sName	GPA	HS

Apply *State*

sID	cName	major	dec

College

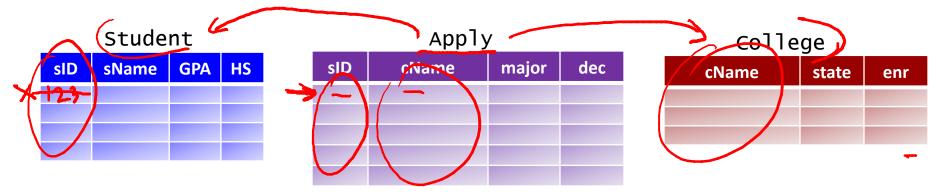| cName	state	enr

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Referential Integrity Enforcement (*R.A* to *S.B*)

Potentially violating modifications:

- Insert into R
- Delete from S
- Update R.A
- Update S.B

If violation → error

Student

sID	sName	GPA	HS
123			

Apply

sID	cName	major	dec

College

cName	state	enr

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Referential Integrity Enforcement (*R.A* to *S.B*)

Special actions:

- Delete from S   *error*

   Restrict (default), **Set Null**, **Cascade**

- Update S.B

   Restrict (default), **Set Null**, **Cascade**

Student			
sID	sName	GPA	HS
123			
→456			

→

Apply			
sID	cName	major	dec
NULL	Stanford		
	Standford		

College		
cName	state	enr
Stanford		
Standford		

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