



Constraints & Triggers

Referential Integrity

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

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

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 \rightarrow error

Student

sID	sName	GPA	HS
123			

Apply






sID	cName	major	dec
-	-		

College

cName	state	enr

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 Stanford		

College

cName	state	enr
Stanford		
Stanford		