

Session 3-4 Integrity Constraints

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Integrity Constraints

- **Entity Integrity:** each entity type must have a valid (not null), *unique identifier*
- **Domain Integrity:** attributes must hold valid values (e.g., numeric (5,2), upper limit)
- **Referential Integrity:** each foreign key instance in an entity must match a primary key instance in the associated entity



Domain Integrity Constraint

Table 5-1 Domain Definitions for INVOICE Attributes

Attribute	Domain Name	Description	Domain
Customer_ID	Customer_IDs	Set of all possible customer IDs	character: size 5
Customer_Name	Customer_Names	Set of all possible customer names	character: size 25
Customer_Address	Customer_Addresses	Set of all possible customer addresses	character: size 30
City	Cities	Set of all possible cities	character: size 20
State	States	Set of all possible states	character: size 2
Postal_Code	Postal_Codes	Set of all possible postal zip codes	character: size 10
Order_ID	Order_IDs	Set of all possible order IDs	character: size 5
Order_Date	Order_Dates	Set of all possible order dates	date format mm/dd/yy
Product_ID	Product_IDs	Set of all possible product IDs	character: size 5
Product_Description	Product_Descriptions	Set of all possible product descriptions	character size 25
Product_Finish	Product_Finishes	Set of all possible product finishes	character: size 15
Standard_Price	Unit_Prices	Set of all possible unit prices	monetary: 6 digits
Product_Line_ID	Product_Line_IDs	Set of all possible product line IDs	integer: 3 digits
Ordered_Quantity	Quantities	Set of all possible ordered quantities	integer: 3 digits

Domain definitions enforce domain integrity constraints



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Referential Integrity Constraint

- Any foreign key value (on the many side) MUST match a primary key value in the relation of the one side
- Violation:

<u>DeptNo</u>	DeptName	DeptBudget
1	Marketing	220,000
2	Operations	400,000
3	Accounting	100,000

<u>EmpNo</u>	EmpName	EmpID	DeptNo
1	Smith, Joseph	111-11-1111	3
2	Jones, David	222-22-2222	2
3	Olson, Jane	333-33-3333	3
4	Neff, Arnold	444-44-4444	1
5	Homes, Denise	555-55-5555	1
6	Naumi, Susan	666-66-6666	2
7	Young, John	777-77-7777	3



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Referential Integrity: Rules for Deletion

- Interrelated data can **not** be carelessly deleted from the database. Some options:
 - **Delete Restrict:** do not delete a customer record if they have related order records
 - **Cascade Delete:** when deleting a customer record, all related order records are deleted as well
 - **Set Null:** when deleting a customer record, set the foreign key to the customer in the order records to null → not allowed for weak entities



Wrap-up

- Integrity Constraints
 - Entity Integrity
 - Domain Integrity
 - Referential Integrity



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