SQL Constraints

- PRIMARY KEY
- FOREIGN KEY
- DEFAULT
- CHECK

Types of Data Integrity

Domain Integrity (Columns)

Entity Integrity (Rows)

Referential Integrity (Between Tables or Columns in different rows of the same Table)
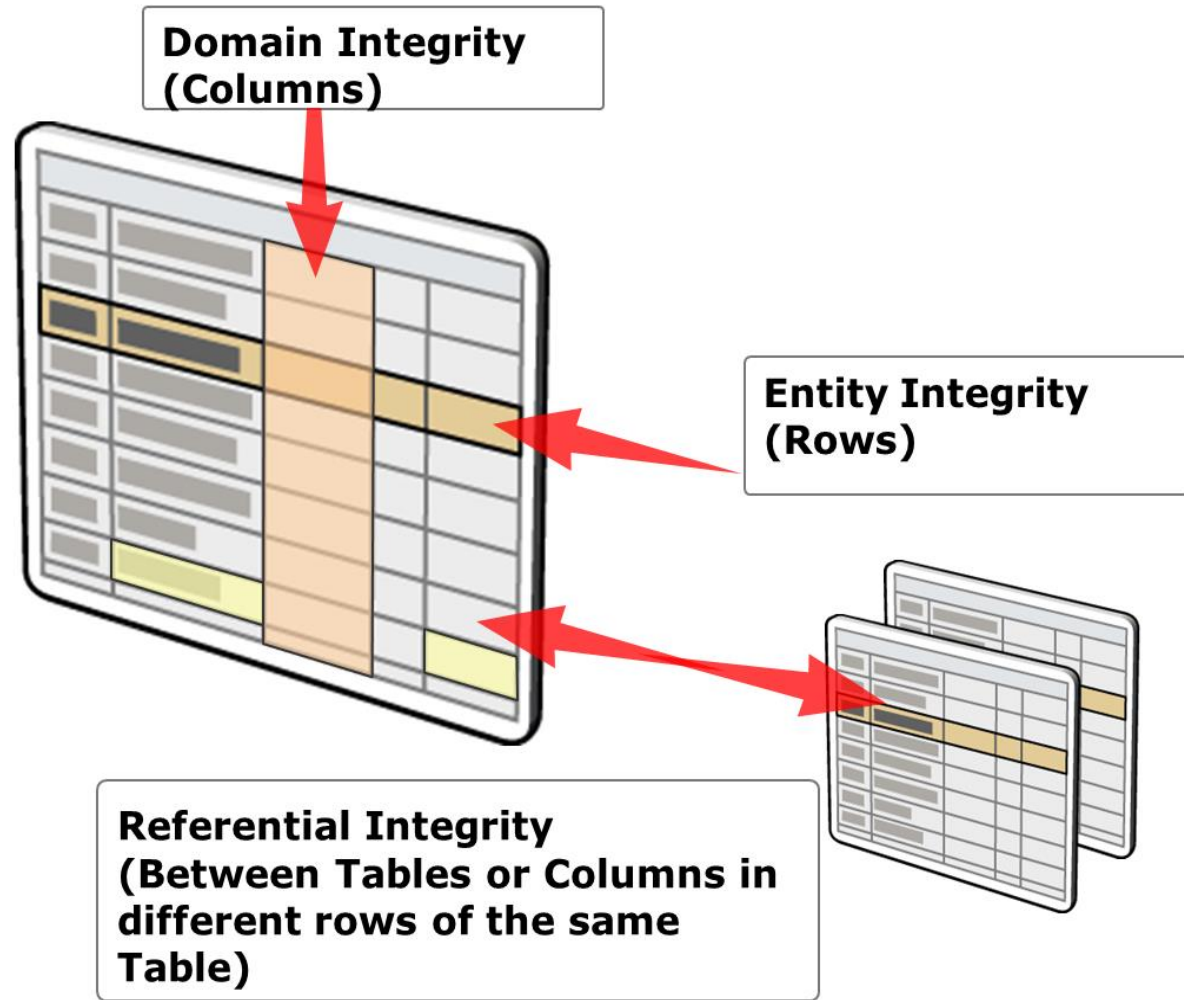
PRIMARY KEY Constraints

- Is used to uniquely identify a row in a table

- Must be unique and not NULL

- May involve multiple columns

```sql
CREATE TABLE Sales.Opportunity
(
        OpportunityID int NOT NULL
          CONSTRAINT PK_Opportunity
          PRIMARY KEY,
        Requirements nvarchar(50) NOT NULL,
        ReceivedDate date NOT NULL,
        LikelyClosingDate date NULL,
        SalespersonID int NULL,
        Rating int NOT NULL
);
```

How to Create Composite Primay Key

CREATE TABLE dbo.OrderItems
  (
  OrderID int NOT NULL
    REFERENCES dbo.Orders(OrderID),
  ProductID int NOT NULL
    REFERENCES dbo.Products(ProductID),
  UnitPrice money NOT NULL,
  Quantity int NOT NULL
  CONSTRAINT PK_OrderItem PRIMARY KEY CLUSTERED
    (OrderID, ProductID)
  );

FOREIGN KEY Constraints

- Is used to enforce relationships between tables

- Must reference PRIMARY KEY or UNIQUE column(s)

- May be NULL

- Can be applied WITH NOCHECK

```sql
CREATE TABLE Sales.Opportunity
(
        OpportunityID int NOT NULL
          CONSTRAINT PK_Opportunity
          PRIMARY KEY,
        Requirements nvarchar(50) NOT NULL,
        ReceivedDate date NOT NULL,
        LikelyClosingDate date NULL,
        SalespersonID int NULL
          CONSTRAINT FK_Opportunity_Salesperson
          FOREIGN KEY
          REFERENCES Sales.Salesperson (BusinessEntityID),
        Rating int NOT NULL
);
```

DEFAULT Constraints

- Provide default values for columns

- Are used when no value is provided in an INSERT statement

- Must be compatible with the data type for the column

```sql
CREATE TABLE Sales.Opportunity
(

        OpportunityID int,
        Requirements nvarchar(50),
        ReceivedDate date
          CONSTRAINT DF_Opportunity_ReceivedDate
          DEFAULT (SYSDATETIME()),
        LikelyClosingDate date,
        SalespersonID int
        Rating int

);
```

CHECK Constraints

- Limits the values that are accepted into a column

- Values that evaluate to FALSE are rejected

- Care must be taken with values returning NULL

- Can be defined at table level to refer to multiple columns

```sql
CREATE TABLE Sales.Opportunity
(
        OpportunityID int,
        Requirements nvarchar(50),
        ReceivedDate date,
        LikelyClosingDate date,
        SalespersonID int,
        Rating int
          CONSTRAINT CHK_Opportunity_Rating_Range1To4
          CHECK (Rating BETWEEN 1 AND 4)
);
```