

# Microsoft SQL Server 2019

## Design & Develop

---

Masoud Mirzakhani  
**Senior DW/ ETL/ BI Architect**

# Review

---

- Data Type
- Index

# KEY

- Primary Key
- Candidate Key = Unique Key = Surrogate Key

Primary Key	Candidate Key
پلاک ماشین	شماره شاسی ماشین
کد ملی	شماره شناسنامه+سال تولد+محل تولد
شماره دانشجویی	کد ملی

# Data Integrity

---

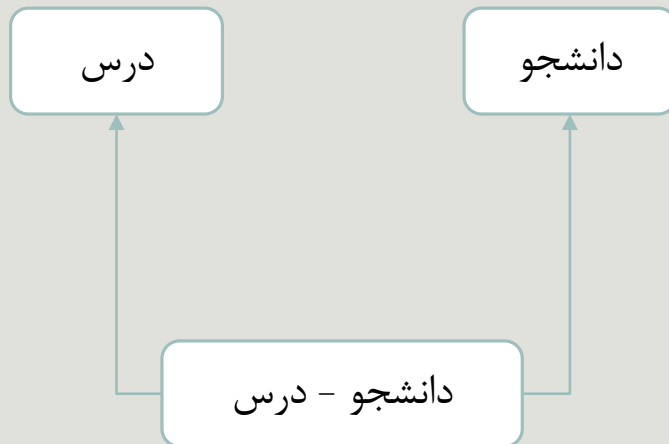
- Unique
  - Search => Index
- Reference
  - Search => Index
- KEY
  - Unique => Index
- Referential Integrity
  - Foreign Key → Key

# Cardinality

رابطه	مثال
One-to-one	شخص ↔ کارمند
One-to-many	شخص ↔ محل تولد
Many-to-many	دانشجو ↔ درس

# Cardinality

---



# Database Design

---

- Redundancy
  - Normalization
- Coding

# Database Normalization

---

- Shape of a Table
- Relation between attributes (Non Key att. & Key att.)



# Database Normalization

---

- Shape of a Table
  - 1NF
    - Atomic Columns
    - No Array

# Database Normalization

---

- Shape of a Table
  - 1NF
    - Atomic Columns

EmployeeCode	Name
1	Masoud, Mirzakhani

EmployeeCode	FirstName	LastName
1	Masoud	Mirzakhani

# Database Normalization

- Shape of a Table
  - 1NF
    - No Array

FactorID	Items
1	Snack, Chips, Coca, 7UP, Pepsi, Fanta

FactorID	Item1	Item2	Item3	...
1	Snack	Chips	Coca	

FactorID	RowNumber	Item
1	1	Snack
1	2	Chips
1	3	Coca

# Database Normalization

---

- Relation between attributes
  - 2NF
    - تمامی ستون ها باید مرتبط با کل کلید اصلی باشند
    - نه قسمتی از کلید اصلی
      - کلید اصلی مرکب

# Database Normalization

- Relation between attributes
  - 2NF

ParkInfo						
CarID	SpaceNo	FromDateTime	ToDateTime	CarColor	AreaSquare	CarModel

ParkInfo			
CarID	SpaceNo	FromDateTime	ToDateTime

Car		
CarID	CarColor	CarModel

Space	
SpaceNo	AreaSquare

# Database Normalization

---

- Relation between attributes
  - 3NF
    - تمامی ستون ها باید مرتبط با کلید اصلی باشند
    - ستون ها نبایستی ارتباط دیگری داشته باشند

# Database Normalization

---

- Relation between attributes
  - 3NF

Factor					
ID	No	Date	CustomerID	CustomerName	CustomerPhone
234	10	13950101	5	Ali	0912

Factor			
ID	No	Date	CustomerID
234	10	13950101	5

Customer		
CustomerID	CustomerName	CustomerPhone
5	Ali	0912

# Database Best Practices

---

- PRIMARY KEY
  - INTEGER
  - Auto Number = IDENTITY(1,1)
  - Clustered Index
  - Simple, No Composite
- Naming Convention
  - PK = ID
  - FK = TableName+ID



# Database Best Practices

---

- UNIQUE KEY
  - Don't Create
  - UNIQUE INDEX