



# HABIB UNIVERSITY

## Database Systems

CS/CE 355/373 Fall 2023

Instructor: Maria Samad

---

### Functional Dependencies Solution

For the given relation schemas, find the functional dependencies

- CustOrder (OrderID, CustomerID, OrderDate, TotalAmount, CustomerName, Receipt)
- SupplierProduct (SupplierID, ProductID, SupplierName, ProductName, MonthlyReport)
- StudentCourse (StudentID, CourseID, StudentName, CourseTitle, Semester, InstructorID)

#### ONE TENTATIVE SOLUTION:

- CustOrder (OrderID, CustomerID, OrderDate, TotalAmount, CustomerName, Receipt)
  - OrderID  $\rightarrow$  OrderDate
    - The order date (OrderDate) is functionally dependent on the order ID (OrderID). Each order has a unique order date.
  - OrderID  $\rightarrow$  TotalAmount
    - The total amount (TotalAmount) is functionally dependent on the order ID (OrderID). Each order has a unique total amount.
  - CustomerID  $\rightarrow$  CustomerName
    - The customer name (CustomerName) is functionally dependent on the customer ID (CustomerID). Each customer has a unique name.
  - {OrderID, CustomerID}  $\rightarrow$  Receipt
    - The receipt (Receipt) is functionally dependent on the combination of OrderID and CustomerID. This suggests that multiple customers can place orders with the same OrderID, and each combination has a unique receipt.
  - OrderID  $\rightarrow$  Receipt
    - The receipt (Receipt) can also be functionally dependent on the order ID (OrderID). Each order can have a unique receipt.
- SupplierProduct (SupplierID, ProductID, SupplierName, ProductName, MonthlyReport)
  - {SupplierID, ProductID}  $\rightarrow$  MonthlyReport
    - The monthly report (MonthlyReport) is functionally dependent on the combination of SupplierID and ProductID. This suggests that a specific combination of supplier and product uniquely identifies the monthly report.
  - SupplierID  $\rightarrow$  SupplierName
    - The supplier name (SupplierName) is functionally dependent on the supplier ID (SupplierID). Each supplier has a unique name.
  - ProductID  $\rightarrow$  ProductName
    - The product name (ProductName) is functionally dependent on the product ID (ProductID). Each product has a unique name.

- StudentCourse (StudentID, CourseID, StudentName, CourseTitle, Semester, InstructorID)
  - {StudentID, CourseID} → Semester
    - The semester (Semester) is functionally dependent on the combination of StudentID and CourseID. This dependency indicates that a specific combination of student and course uniquely identifies the semester.
  - {StudentID, CourseID} → InstructorID
    - The instructor ID (InstructorID) is functionally dependent on the student ID (StudentID) and course ID (CourseID). Each course can be taught by many instructors, however a student can be enrolled with just one of the course sections, so a specific combination of student and course uniquely identifies the instruc.
  - StudentID → StudentName
    - The student name (StudentName) is functionally dependent on the student ID (StudentID). Each student has a unique name.
  - CourseID → CourseTitle
    - The course title (CourseTitle) is functionally dependent on the course ID (CourseID). Each course has a unique title.