



HD EDUCATION

FIT2094

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关于 **HD EDUCATION**

HD · EDUCATION (简称HD·EDU) 成立于2018年1月，拥有学业辅导和职业规划两大核心业务。从创办伊始就秉承着“让年轻人成为知识的生产者、传播者、受惠者”的使命，坚持从留学生的角度出发，为他们量身制定属于他们的课程。“成为最受年轻人喜爱的教育品牌”一直是我们的不懈追求。

截止2020年，我们的Tutor人数已达1300人，业务范围涵盖了澳大利亚、新西兰、美国、英国4个国家的40多所高校，为15万留学生提供了优质的学习辅导服务，成为澳大利亚华人留学生覆盖人数最多的在线教育学习平台。

HD·EDU的成长有你陪伴

课后，如果您有任何建议和意见，我们都非常欢迎您联系小助手分享您的想法，给予我们改进和提高的机会！

感谢您参与HD Education的辅导课程！

TUTOR

Self-Introduction

自我介绍

#

1. 🎓 Monash University
2. 📄 Bachelor of Computer Science in Data Science
Master of Information Technology
3. 📚 三年数据库相关教学经验
4. 🧑 从学生角度出发讲解，耐心负责
5. ❤️ 吸猫 乐高 旅游
6. 🧑 目前在某互联网大厂任数据工程师

TUTOR: Joey



同学们
有问题
怎么办?

方法一：
举手

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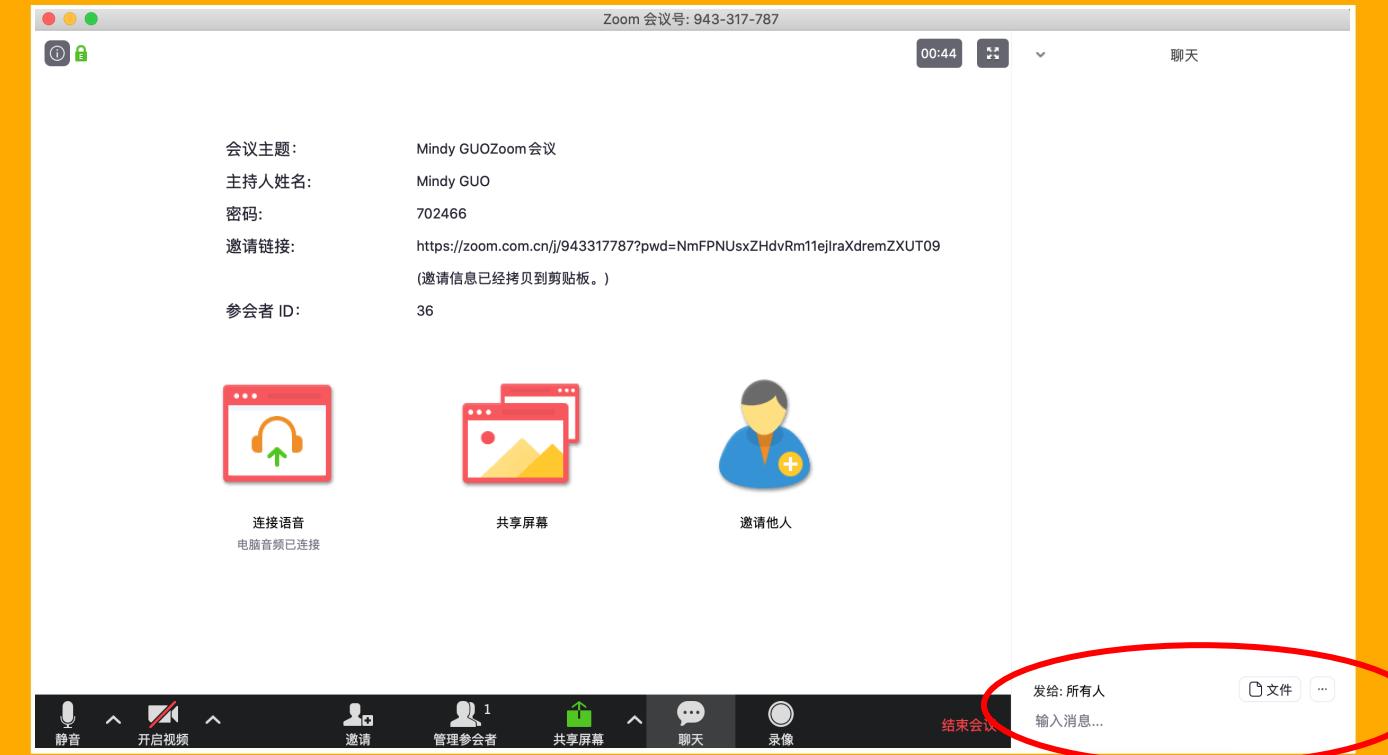


1. 点【参会者】
2. 点【举手】即可与老师实时互动
3. 问题被解答了还可以【手放下】

同学们
有问题
怎么办?

方法二：
文字提问

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红圈处输入问题提问

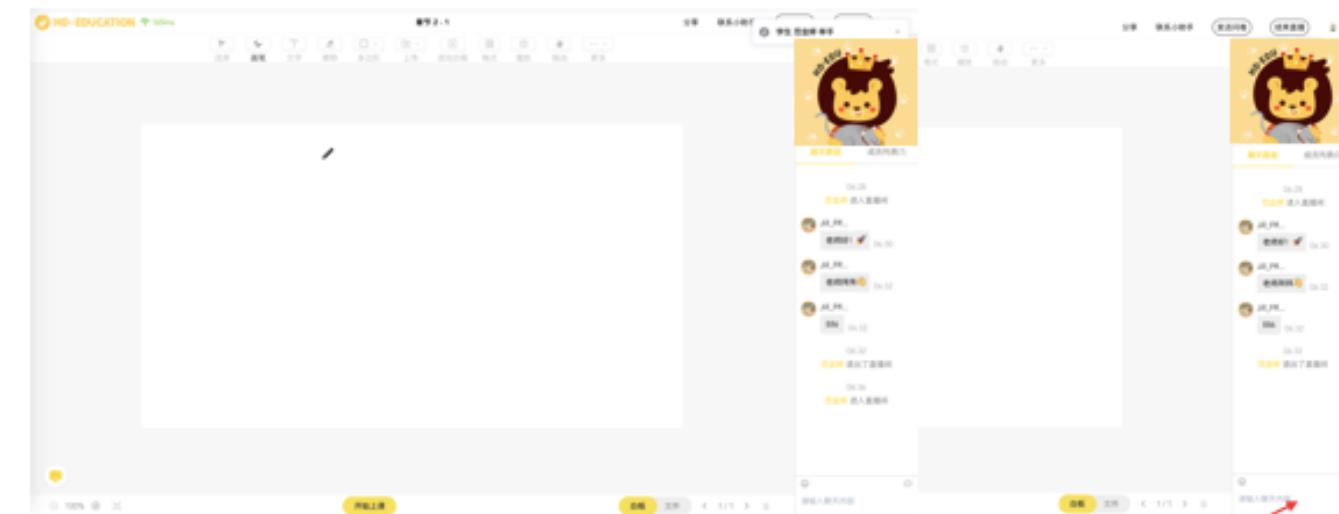
同学们
有问题
怎么办?

直播平台

互动方法

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直播平台：举手+聊天室提问



点【参会者】再点【举手】，即可与老师实时互动！在此输入你想问的问题

问题被解答了还可以【手放下】

学科特点及学习方法

学科特点:

1. 考试题量大，题目长
2. 知识点清晰，相互关联性大
3. 注重细节

学习方法:

1. 养成计时答题的习惯
2. 充分利用学校tutorial资料

备考方法 & Tips:

1. 多读材料，养成能快速在材料定位关键信息的能力
2. 多练代码，保持手感
3. 做题一定要计时！！！

CONTENT

课程目录

- ✓ 1 What is Database? Database Element
- ✓ 2 Database Design I (Conceptual Model)
- ✓ 3 Relational Model (Relational Algebra)
- ✓ 4 Normalisation
- ✓ 5 Database Design II (Logical Model)
- ✓ 6 Basic SQL & Transaction Management
- ✓ 7 SQL & Advanced SQL
- ✓ 8 Web Database / NoSQL

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上周回顾

重要程度: ★★★★
难易程度: ★★★★★

1、Normalisation

- **1NF: Remove repeating group, find PK(用下划线)**
- **2NF: Remove partial dependency**
- **3NF: Remove transitive dependency**

本章节知识点

知识点1 Logical Model



知识点讲解

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Logical Model

重要程度: ★★★★★
难易程度: ★★★★

❖ From Conceptual Model to Logical Model

- What we need to do?

- 把key换成PK
- 让FK找到自己的位置
- 如有需要可以加上surrogate key (根据题目要求)

- How?

- Entity

- Map strong entities
- Map weak entities
- Map associative entities (M:N Relationship)

- Relationship

- Map binary relationship
- Map unary relationship
- Map ternary relationship

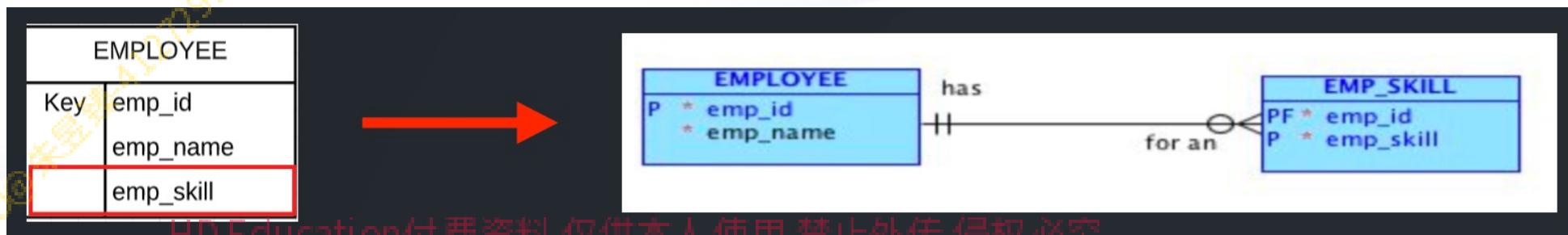
4. Logical Model – Map Strong Entities

重要程度: ★★★★★
难易程度: ★★★★

- Some attributes need to be considered
- Composite Attribute
 - E.g. Address → street, city, state, postcode
 - In logical model: 拆分之后只留下拆分出来的attribute



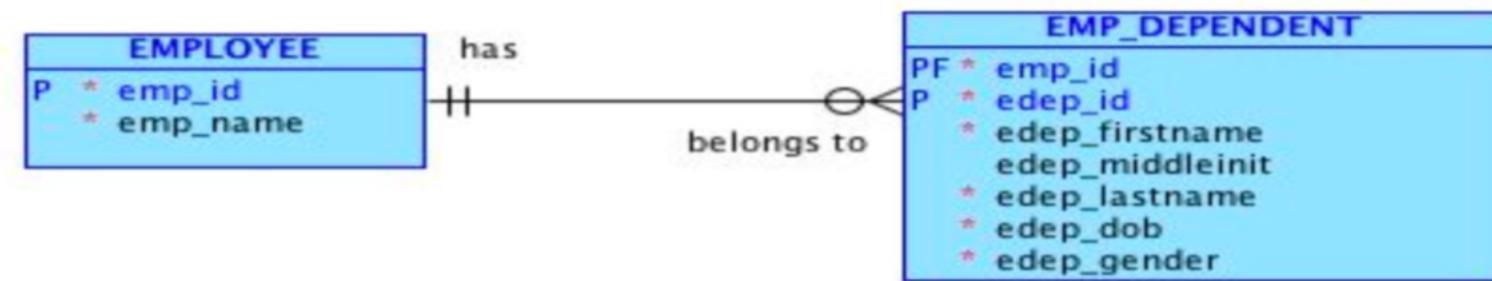
- Multivalued Attribute
 - E.g. Skill (a person may have more than one skill)
 - In logical model: 另建一个entity, 将multi-valued attribute转移到新的entity, 并和原本的entity建立relationship



重要程度: ★★★★★
难易程度: ★★★★

4. Logical Model – Map Weak Entities

- Weak Entity: Need to depend on other entity, has at least one PK is picked from others
 - In logical model:
 - Identify Relationship (实线)
 - FK 在weak的一方, 同时作为weak方的PK

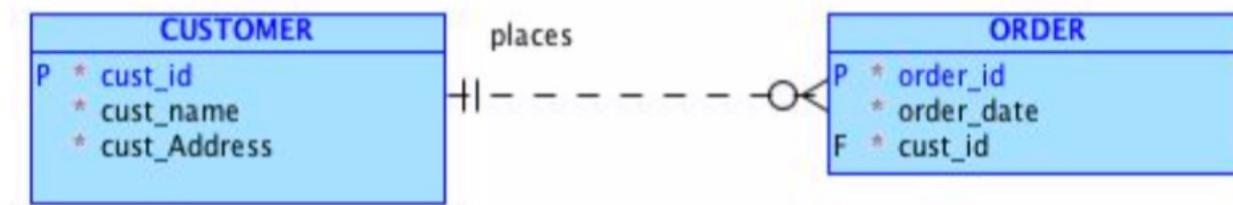


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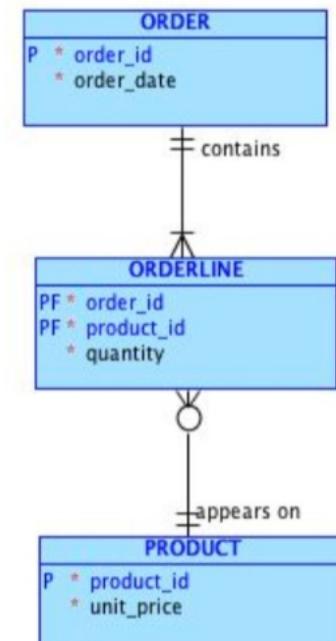
重要程度: ★★★★★
难易程度: ★★★★

4. Logical Model – Map Binary Relationship

- **1:M**
- Many 的一边存有另一边的PK作为FK(Non- Identifying relationship) 或者PF(Identifying relationship)



- **M:N**
- 拆分成1:M 和 1:M,两边entity 的PK 作为中间associative entity的FK / PF

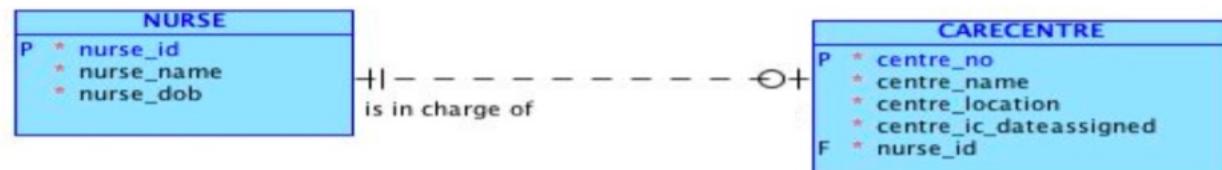


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重要程度: ★★★★★
难易程度: ★★★★

4. Logical Model – Map Binary Relationship

- 1:1
- FK 在 optional 方 (为了保证尽量减少null在数据库中)



- Special case: 1:1 (mandatory for both) 考虑实际情况

例题讲解

重要程度: ★★★★★
难易程度: ★★★

1. Draw a *logical level model* using *crowsfoot notations* that depicts the situation described below. (15 marks)

The local under-sixteen football league needs a database to help track teams, children that sign up to play in the league, the parents of these children and the coaches for each team.

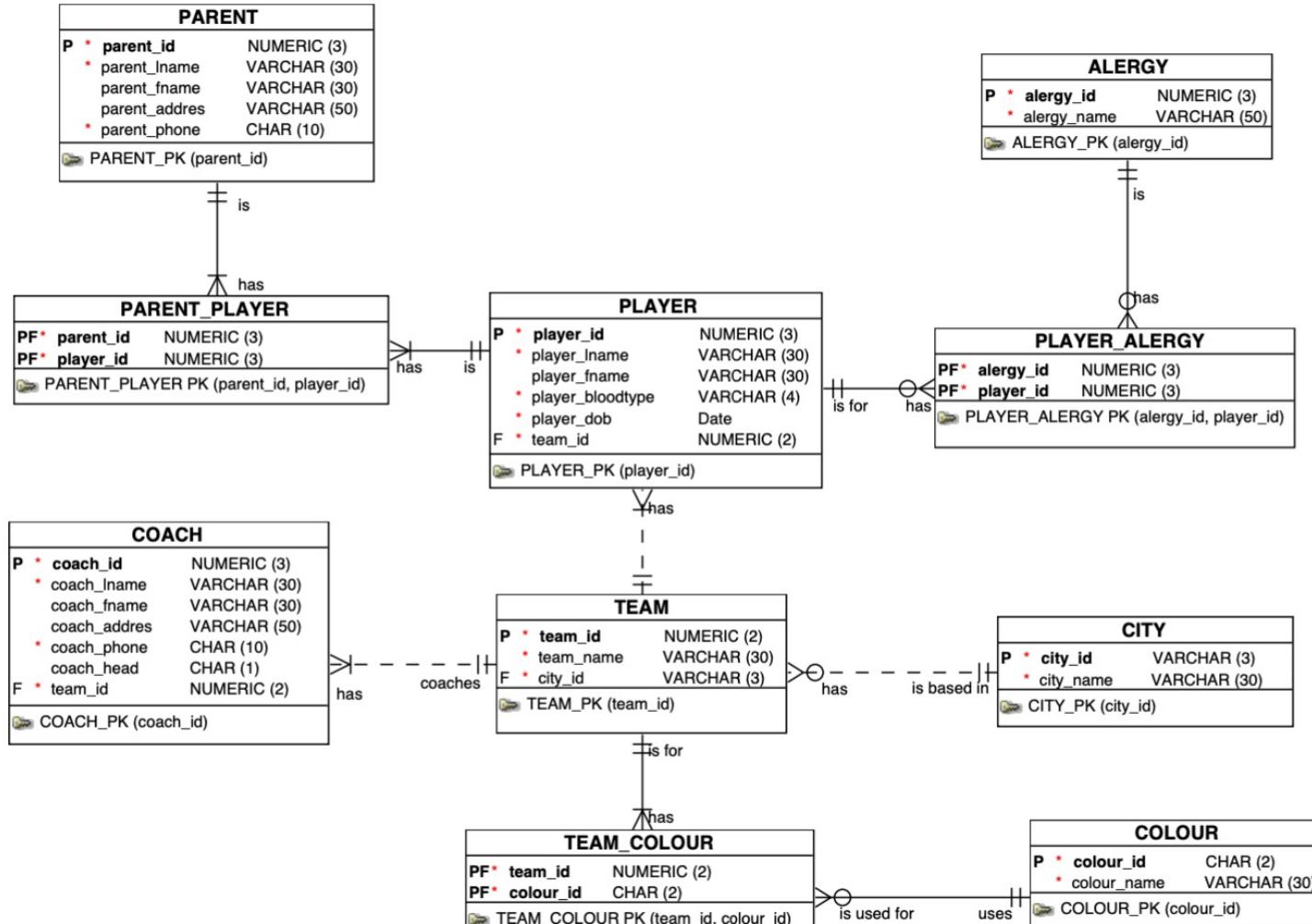
The league wishes to record the details for each parent of a particular player (the parents last name, first name, phone contact number and address).

For each player the system needs to record the player's last name, first name, blood type and their date of birth. Any allergies that the player has also need to be recorded. A player may only play in one team with this league.

Each team is given a unique id, the system needs to record this id, the teams name and the city their home ground is located in (a city may have several under-sixteen teams based in it). A team's colours are also to be recorded, teams may choose to use a single or multiple team colours. A team may have several coaches – one of the coaches is designated as the head coach. A coach is only permitted to coach one team in the under-sixteen league. All communications from the league to the team are via the head coach. To be registered to play in this league a team must have a head coach and at least one player. The database needs to track a coach's first and last name, phone and address contact details and the team that they are coaching.

例题讲解

重要程度: ★★★★☆
难易程度: ★★★★☆



重难点总结

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重难点总结

1、Logical Model

- 要标出**primary key** 和 **foreign key**
- 题目允许的情况下可以有**surrogate key**
- 遇到**many to many relationship**一定要拆开
- 遇到**multi-value attribute**要把它抽出来成为一个新的**entity**

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课后作业

Q2 Database Design (20 marks)

Monash Computing Students Society (MCSS) is one of the student clubs at Monash University.

Students are welcome to join as a member. When a student joins MCSS, a member id is assigned, and the students first name, last name, date of birth, email and phone number will be recorded. This club has an annual membership fee. When a member has paid the membership fee for the current year, the current year is recorded against the year of membership as part of their membership details.

MCSS hosts several events throughout the year. The events are currently categorised into *Professional Events*, *General Events*, and *Social Events*. MCSS would like to be able to add further categories as they develop new events. When an event is scheduled, MCSS assigns an event id to the event. The event date and time, description, location, allocated budget, the ticket price and the discount rate (eg 5%) for members. Some events are organised as free events for members. In this situation, the discount rate is recorded as 100% for members. For all events, only members can purchase the tickets. However, members can buy additional tickets for their friends or family at full price. For each of the sales, the receipt number, number of tickets sold, total amount paid and the member id are recorded.

Some events attract some sponsorships. The sponsor may be an organisation or an individual. The sponsors provide financial support to the event. Some events may have several sponsors. The amount of financial support provided by each sponsor is recorded for the event. Each sponsor is identified by a sponsor id. The name, contact email and sponsor type are also recorded. A sponsor may support several events throughout the year.

For some events such as career night, MCSS may also invite some guest speakers to share their experience. The database records all guests' information, the guests full name, email and phone number are recorded. If a guest comes from an organisation or an individual that provides a sponsorship to any of the MCSS events (does not have to be at the event where the guest speaks), this fact will also be recorded. A guest may be invited to several events.

Create a **logical level diagram using Crow's foot notations** to represent the "Monash Computing Students Society" data requirements described above. Clearly state any assumptions you make when creating the model.

This model must be created using LucidChart (**you MUST NOT use SQL Developer Data Modeller**). After you have built your model in LucidChart, export it as a png image and add it to the answer paper via the MS Word Insert - Picture menu.

Please note the following points:

- Be sure to include all relations, attributes and relationships (unnecessary relationships must not be included)
- Identify clearly the Primary Keys (P) and Foreign Keys (F), as part of your design
- In building your model you must conform to FIT2094 modelling requirements
- The following are **NOT required** on your diagram
 - verbs/names on relationship lines
 - indicators (*) to show if an attribute is required or not
 - data types for the attributes

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下节课预告

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下节课预告

WEEK 6: DDL, Transaction Management

- 1、 DDL
- 2、 Transaction Management

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者点击复制问卷链接



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