



HD EDUCATION

FIT2094

TUTOR:Joey

HD@東
12993





全球累计服务用户超十万



HD@群里4127299



扫码关注HD·EDU公众号
获取更多留学新资讯

· 让海外学习更轻松 ·

HD Education付费资料,仅供本人使用,禁止外传,侵权必究。



HD@来这里赚41272993

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

#

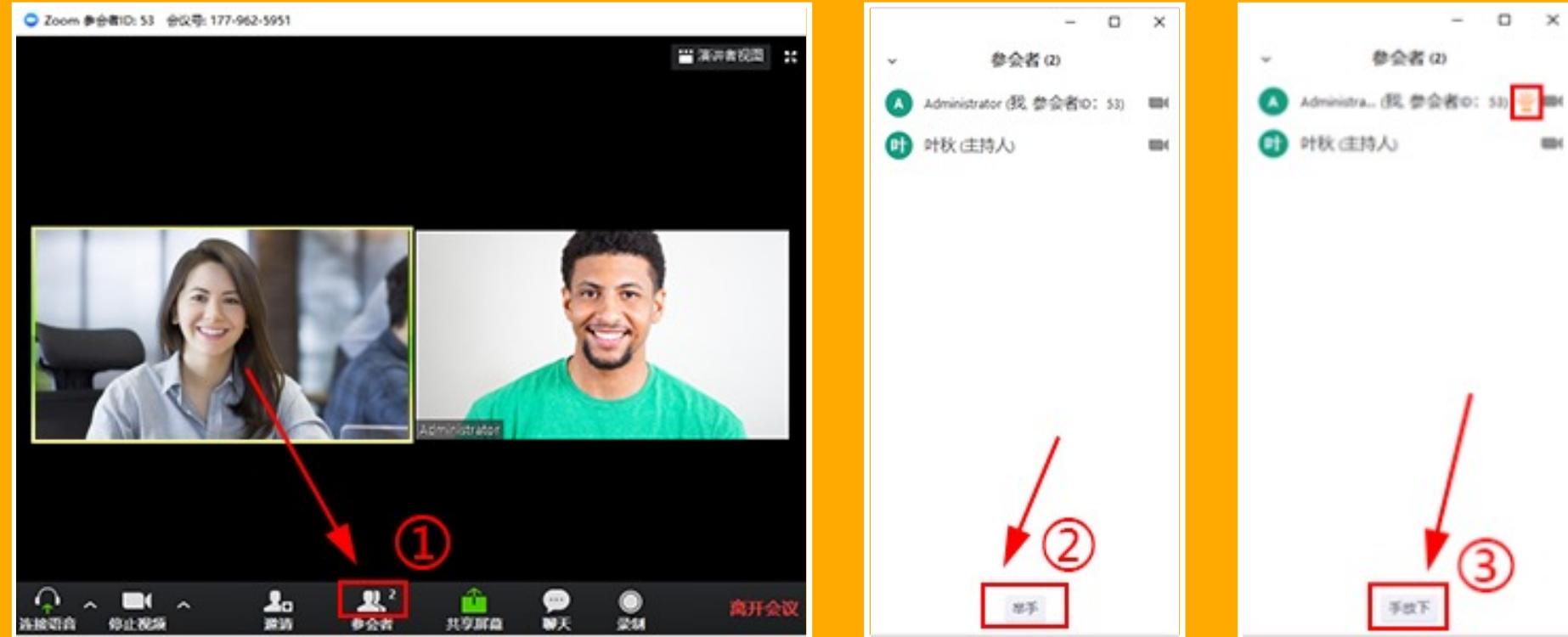
1. 🎓 Monash University
2. 📄 Bachelor of Computer Science in Data Science
Master of Information Technology
3. 📚 三年数据库相关教学经验
4. 🧑 从学生角度出发讲解，耐心负责
5. ❤️ 吸猫 乐高 旅游
6. 💻 目前在某互联网大厂任数据工程师

TUTOR: Joey



同学们
有问题
怎么办?

方法一：
举手

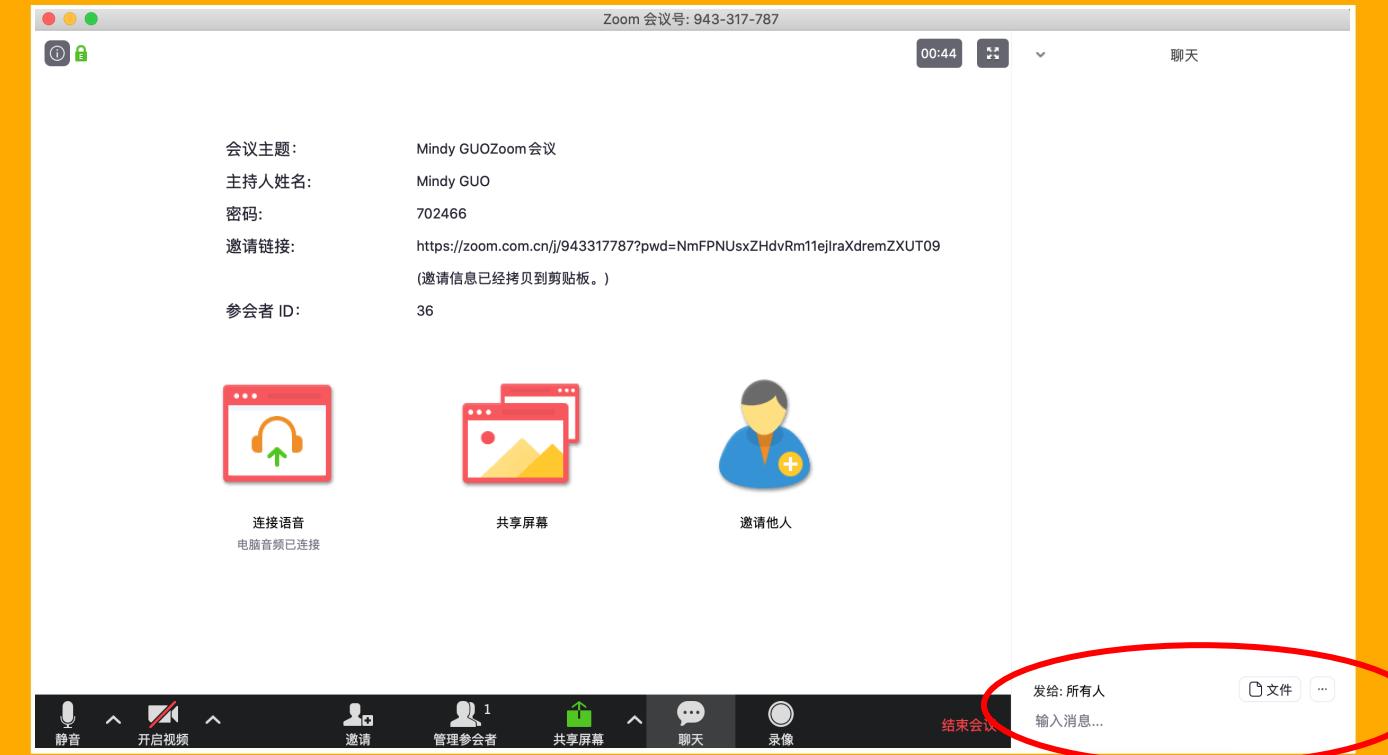


- 1.点【参会者】
- 2.点【举手】即可与老师实时互动
- 3.问题被解答了还可以【手放下】

同学们
有问题
怎么办?

方法二：
文字提问

HD@教育网 412729933



红圈处输入问题提问

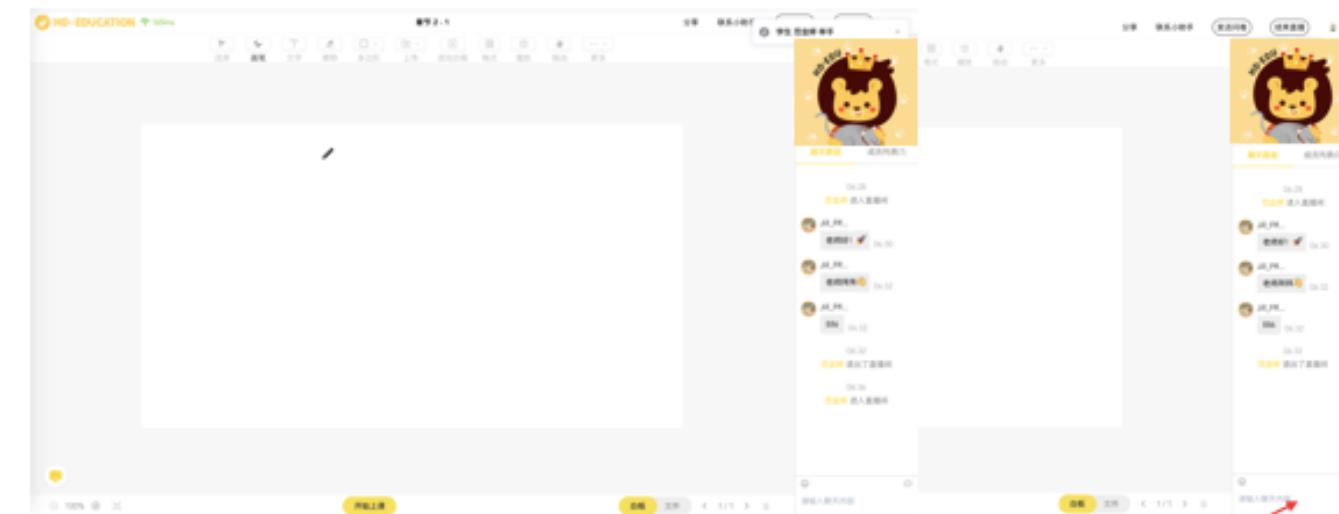
同学们
有问题
怎么办?

直播平台

互动方法

HD@就是赚 412729933

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】

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

HD@千里眼412729933

HD Education付费资料,仅供本人使用,禁止外传,侵权必究。



上周回顾

重要程度: ★★★ **难易程度:** ★★★★

1、Relational Model

- NO duplicate tuples
 - Tuples have no order within a relation
 - Attributes have no order
 - Tuple values are atomic
 - **Superkey**: 能标识唯一tuple的属性的组合
 - **Candidate key**: 不含多余attribute的superkey
 - **Primary key**: 从candidate key中选一个，且仅有一个pk (但有可能由多个attribute组成 --> composite pk)
 - **Foreign key** : 某个表的fk是另一表的pk (该表有关联的前提下) 或为NULL

2、Relational Algebra

- **SELECT** 选择运算
 - 选行的时候用（筛选条件）
 - **JOIN** 连接运算
 - 同时需要多个表的时候用

$\sigma_{expr}(Rel)$

$\pi_{A,B,C}(Rel)$

本章节知识点

知识点1 Functional Dependency

知识点2 Normalisation



知识点讲解

HD Education付费资料,仅供本人使用,禁止外传,侵权必究。

Functional Dependency

重要程度: ★★
难易程度: ★★

- ❖ $A \rightarrow B$: B is functionally depends on A, since the value of A determines the ONLY VALUE of B

通过student_id 可以得到与之对应的唯一一个student_name, 证明student_name functionally depends on student id

(e.g. student id \rightarrow student_name)

- Student_id: independent variable
- Student_name: dependent variable

- **Total dependency**

- A determines B & B determines A
- Student_id \rightarrow student_oshc
- Student_oshc \rightarrow student id

- ❖ **Composite PK**

- **Full dependency**

- Occur when an attribute is ALWAYS DEPENDENT on all attributes in the composite pk
- project_no, emp_no \rightarrow working_hour (working hours for this project)

- **Partial dependency**

- Some attributes depends on only part of the composite pk
- 有的attribut只依赖于composite pk里的某一个attribute
- Composite pk: project_no, emp_no
- But: emp_no \rightarrow emp_name (partial dependency)

- **Transitive dependency**

- $X \rightarrow Y, Y \rightarrow Z$ (X is PK, Y & Z are not PK)

HD Education付費資料勿提供人使用禁止外傳,侵權必究。

Anomalies (Insert, Delete, Update)

重要程度: ★★
难易程度: ★★

- ❖ **Insert anomaly** 插入异常: 表中只记录了参与了项目的employee的信息 (没有参与项目的employee的信息应该放在哪里?)
- ❖ **Delete anomaly** 删除异常: 只想删除某一些数据, 但是把不该删的也删除了 (比如某人离职, 但是他单独负责的项目需要被记录在数据库中)
- ❖ **Update anomaly** 更新异常: 更新的时候需要一行行去更新, 容易出错 (如某人职位发生了变化)

PROJ_NUM	PROJ_NAME	EMP_NUM	EMP_NAME	JOB_CLASS	CHG_HOUR	HOURS
15	Evergreen	103	June E. Arbough	Elect. Engineer	84.50	23.8
		101	John G. News	Database Designer	105.00	19.4
		105	Alice K. Johnson *	Database Designer	105.00	35.7
		106	William Smithfield	Programmer	35.75	12.6
		102	David H. Senior	Systems Analyst	96.75	23.8
18	Amber Wave	114	Annelise Jones	Applications Designer	48.10	24.6
		118	James J. Frommer	General Support	18.36	45.3
		104	Anne K. Ramoras *	Systems Analyst	96.75	32.4
		112	Darlene M. Smithson	DSS Analyst	45.95	44.0
		105	Alice K. Johnson	Database Designer	105.00	64.7
22	Rolling Tide	104	Anne K. Ramoras	Systems Analyst	96.75	48.4
		113	Delbert K. Joenbrood *	Applications Designer	48.10	23.6
		111	Geoff B. Wabash	Clerical Support	26.87	22.0
		106	William Smithfield	Programmer	35.75	12.8
		107	Maria D. Alonzo	Programmer	35.75	24.6
25	Starflight	115	Travis B. Bawangi	Systems Analyst	96.75	45.8
		101	John G. News *	Database Designer	105.00	56.3
		114	Annelise Jones	Applications Designer	48.10	33.1
		108	Ralph B. Washington	Systems Analyst	96.75	23.6
		118	James J. Frommer	General Support	18.36	30.5
		112	Darlene M. Smithson	DSS Analyst	45.95	41.4

Normalisation

重要程度: ★★
难易程度: ★★

- ❖ 目的: 确保数据之间的依赖关系是符合逻辑的, 避免发生插入, 删除, 更新异常
- ❖ **Normalisation** 能让最后的数据库表结构符合某种设计标准的级别
- ❖ 分为 **1NF** , **2NF** , **3NF** , BCNF , 4NF , 5NF (FIT 2094/9132只学到**1NF – 3NF**)

Normalisation -- UNF

重要程度: ★★★★☆
难易程度: ★★

❖ UNF(un-normalised form): 把所有看到的表格信息放在一起(包括repeating group)

CUSTOMER ORDER

Order Number:	61384	Order Date:	
Customer Number:	1273		12/3/2017
Customer Name:	Computer Training Centre		
Customer Address:	123 Excellent St Monash, Vic, 3000		
PART NUMBER	DESCRIPTION	QTY ORDERED	LINE PRICE
M128	Bookcase	4	800
B381	TV Cabinet	2	600
R210	Round Table	3	1500

ORDER(order_no, order_date, cust_no, cust_name, cust_address (prod_no, prod_desc, qty_ordered, line_price))

Normalisation – UNF to 1NF

重要程度: ★★★★☆
难易程度: ★★

- ❖ Remove repeating group
- ❖ Identify a unique identifier for repeating group 找pk
- ❖ 移除了repeating group, 定义了每个relation的pk
- ❖ 如果UNF 没有repeating group, 那么定义完pk之后就已经符合了1NF
- ❖ PK 要用下划线画出来
- ❖ RELATION 名称要大写

CUSTOMER ORDER			
Order Number:	61384	Order Date:	12/3/2017
PART NUMBER	DESCRIPTION	QTY ORDERED	LINE PRICE
M128	Bookcase	4	800
B381	TV Cabinet	2	600
R210	Round Table	3	1500

UNF:

ORDER(order_no, order_date, cust_no, cust_name, cust_address (prod_no, prod_desc, qty_ordered, line_price))

1NF:

ORDER(order_no, order_date, cust_no, cust_name, cust_address)
INFO(order_no, prod_no, prod_desc, qty_ordered, line_price)

Normalisation – 1NF to 2NF

重要程度: ★★★★☆
难易程度: ★★

- ❖ Remove partial dependency
- ❖ 写出 partial dependency
- ❖ 移除partial dependency里partial dependent了某个key的那些attribute
- ❖ 建立新的relation, 把参与了partial dependency的key和attributes放到新的relation里作为pk, 但是不要删去那个key在原本relation里的位置
- ❖ Full dependent pk的attribute留在原本的位置

1NF:

ORDER(order_no, order_date, cust_no, cust_name, cust_address)
 INFO(order_no, prod_no, prod_desc, qty_ordered, line_price)

Partial Dependency:

Prod_no --> prod_desc, line_price

2NF:

ORDER(order_no, order_date, cust_no, cust_name, cust_address)
 INFO(order_no, prod_no, qty_ordered)
 PRODUCT(prod_no, prod_desc, line_price)

CUSTOMER ORDER			
Order Number:	61384	Order Date:	12/3/2017
PART NUMBER	DESCRIPTION	QTY ORDERED	LINE PRICE
M128	Bookcase	4	800
B381	TV Cabinet	2	600
R210	Round Table	3	1500

Normalisation – 2NF to 3NF

重要程度: ★★★★☆
难易程度: ★★

- ❖ Remove transitive dependency
- ❖ 写出transitive dependency
- ❖ 移除partial dependency里transitive dependent了某个non-key attribute的那些attribute
- ❖ 建立新的relation, 把参与了transitive dependency的attributes放到新的relation里, 被dependent的non-key attribute 作为这个relation的pk, 但是不要删去它在原本relation里的位置
- ❖ 没有参与transitive dependency的attributes留在原本的位置

2NF:

ORDER(order_no, order_date, cust_no, cust_name, cust_address)
INFO(order_no, prod_no, qty_ordered)
PRODUCT(prod_no, prod_desc, line_price)

Transitive Dependency:

cust_no --> cust_name, cust_address

3NF:

ORDER(order_no, order_date, cust_no)
INFO(order_no, prod_no, qty_ordered)
PRODUCT(prod_no, prod_desc, line_price)
CUSTOMER(cust_no, cust_name, cust_address)

CUSTOMER ORDER			
Order Number:	61384	Order Date:	12/3/2017
Customer Number:	1273		
Customer Name:	Computer Training Centre		
Customer Address:	123 Excellent St Monash, Vic, 3000		
PART NUMBER	DESCRIPTION	QTY ORDERED	LINE PRICE
M128	Bookcase	4	800
B381	TV Cabinet	2	600
R210	Round Table	3	1500

重要程度: ★★★★
难易程度: ★★

Normalisation

UNF:

ORDER(order_no, order_date, cust_no, cust_name, cust_address (prod_no, prod_desc, qty_ordered, line_price))

1NF:

ORDER(order_no, order_date, cust_no, cust_name, cust_address)
INFO(order_no, prod_no, prod_desc, qty_ordered, line_price)

Partial Dependency:

Prod_no --> prod_desc, line_price

2NF:

ORDER(order_no, order_date, cust_no, cust_name, cust_address)
INFO(order_no, prod_no, qty_ordered)
PRODUCT(prod_no, prod_desc, line_price)

Transitive Dependency:

cust_no --> cust_name, cust_address

3NF:

ORDER(order_no, order_date, cust_no)
INFO(order_no, prod_no, qty_ordered)
PRODUCT(prod_no, prod_desc, line_price)
CUSTOMER(cust_no, cust_name, cust_address)

HD@教育网课仅供本人使用,禁止外传,侵权必究。

重难点总结

HD Education付费资料,仅供本人使用,禁止外传,侵权必究。

重难点总结

1、Normalisation

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

HD@易趣录41272993

课后作业

2. Normalisation (10 marks)

Monash University owns several performance halls that are used by organizations within and outside Monash University. The following table shows the booking information for several performances across different venues in Monash University. Multiple performances or shows can be organized at the same time across multiple venues. The following situations are observed during the operation of the performance halls:

- Each show is organised by an organisation.
- A single contact number is kept for an organiser.
- A show can be scheduled on multiple days, for example Melbourne Symphony-Summer Classic has two performances on the 12-Jan-2015 and 17-Jan-2015.
- A show can be scheduled twice a day (matinee and night).

Start Time	Date	Venue	Venue Location	Show Type	Show	Organiser	Organiser 's contact
8 PM	12-Jan-2015	Robert Blackwood Hall	Clayton	Music concert	Melbourne Symphony – Summer Classic	MSO	(03) 99021212
8 PM	12-Jan-2015	K3.24	Caulfield	Comedy	Adam Hill	Melbourne Comedy Festival	(03) 99031456
2 PM	14-Jan-2015	Robert Blackwood Hall	Clayton	Musical	Cats	Monash Student Association	(03) 99012233
8 PM	14-Jan-2015	Alexander Theatre	Clayton	Comedy	Dave Hughes	Melbourne Comedy Festival	(03) 99031456
8 PM	16-Jan-2015	Robert Blackwood Hall	Clayton	Music concert	Hoodoo Guru	Mushroom Promoter	(02) 90021002
8 PM	17-Jan-2015	Robert Blackwood Hall	Clayton	Music concert	Melbourne Symphony – Summer Classic	MSO	(03) 99021212

HD@東里頭41272993

HD Education付费资料,仅供本人使用,禁止外传,侵权必究。

下节课预告

HD Education付费资料,仅供本人使用,禁止外传,侵权必究。

下节课预告

WEEK 5: Logical Model

- 1、 convert conceptual model to logical model
- 2、 例题讲解

收集反馈

分享问卷

×

长按保存问卷二维码 或
者点击复制问卷链接



发送提醒

复制链接



课程结束后，如果您对课程或者服务的任何建议和意见
请给予我们提高和改进的机会，感谢您对 HD·EDUCATION 课程和服务的信任！

· 填写问卷操作流程 ·



第一步

关注【海道教育】服务号后
点击【购买通知】或【上课提醒】



第二步

点击【前往学习】



第三步

点击【去评价】就可以为课程进行评价

HD Education付费资料,仅供本人使用,禁止外传,侵权必究。