

**期末项目设计报告**

|  |  |  |  |
| --- | --- | --- | --- |
| 题 目 | 基于Oracle的图书馆读者论坛的数据库设计 | | |
| 课程 | Oracle数据库应用 | | |
| 学 院 | 计算机学院 | | |
| 专 业 | 软件工程 | 年级 | 2018级 |
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| 指导教师 | 赵卫东 | 职称 | 副教授 |

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| **评分项** | **评分标准** | **满分** | **得分** |
| 文档整体 | 文档内容详实、规范，美观大方 | 10 |  |
| 表设计 | 表，表空间设计合理，数据合理 | 20 |  |
| 用户管理 | 权限及用户分配方案设计正确 | 10 |  |
| PL/SQL设计 | 存储过程和函数设计正确 | 25 |  |
| 备份方案 | 备份方案设计正确 | 25 |  |
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| **得分合计** | | |  |

2021 年 6 月 1 日

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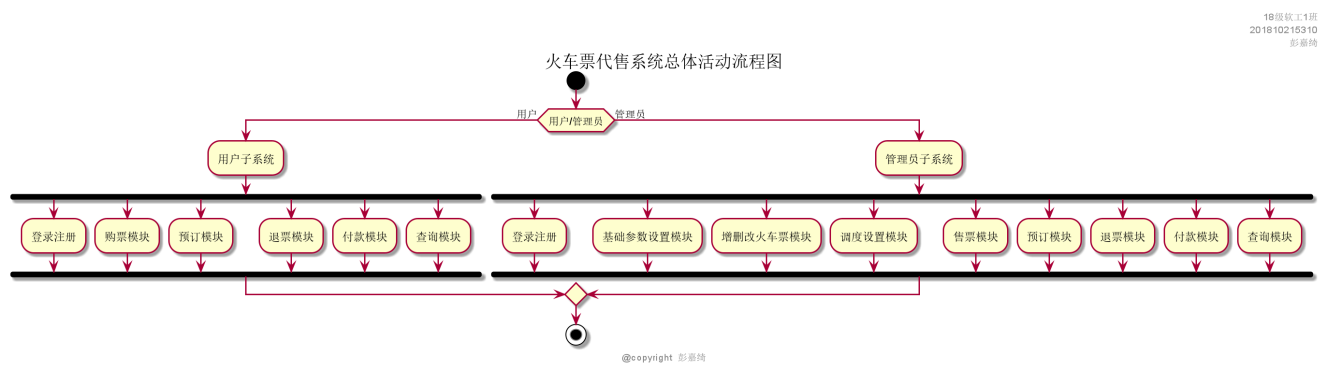
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1. 需求分析

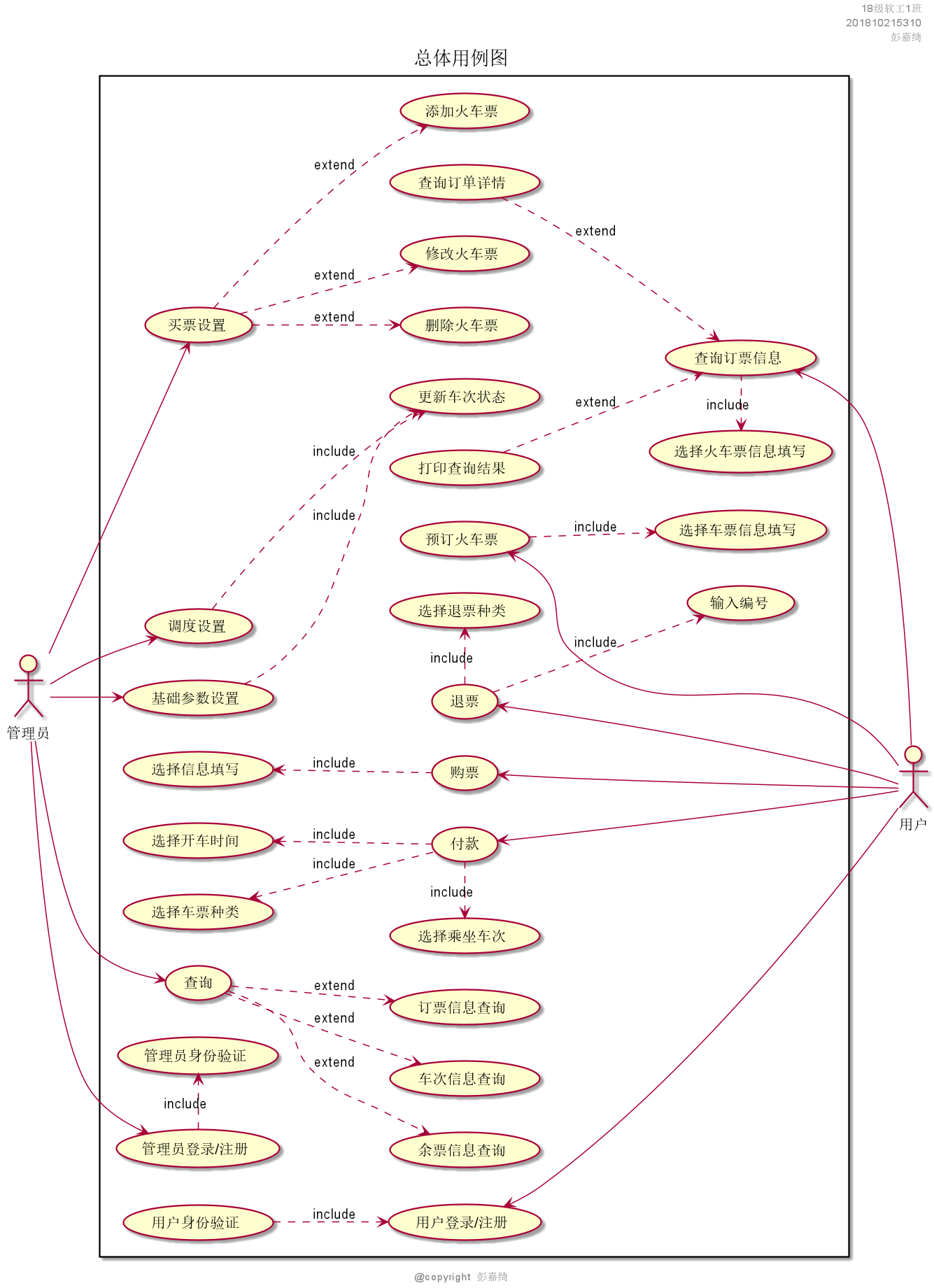
1.1背景

图书馆在正常运营中面对大量书籍、读者信息以及两者间相互联系产生的借书信息、还书信息。现有的人工记录方法既效率低又错误过多，大大影响了图书馆的正常管理工作。因此需要对书籍资源、读者资源、借书信息、还书信息进行管理，及时了解各个环节中信息的变更，有利于管理效率的提高。伴随经济的飞速发展，图书馆的数量量不断增加，为加强读者之间的联系，所以便有了各大图书馆读者论坛的诞生，本项目也因此设计了一个基于Oracle 的图书馆读者论坛数据库。

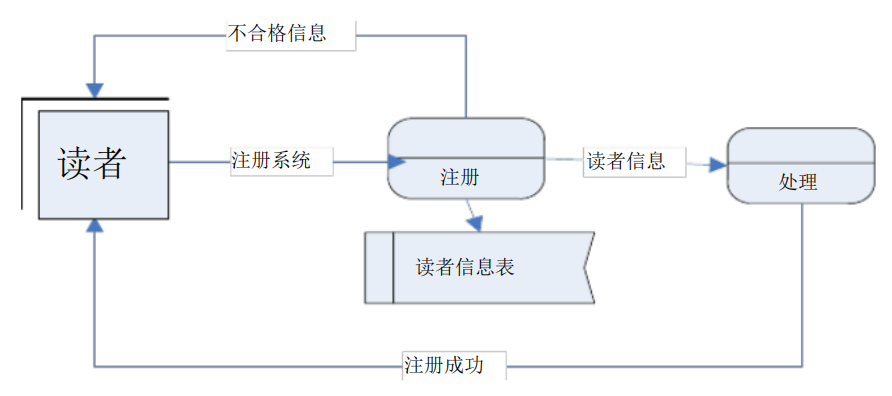
1.2总体活动流程图

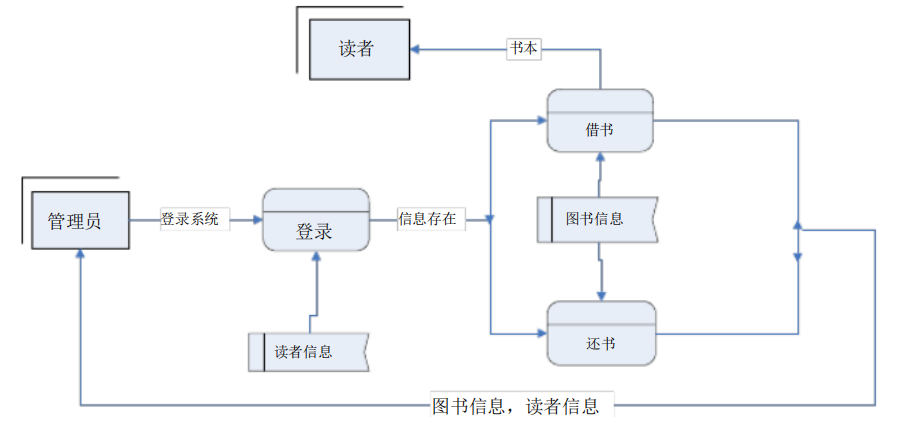
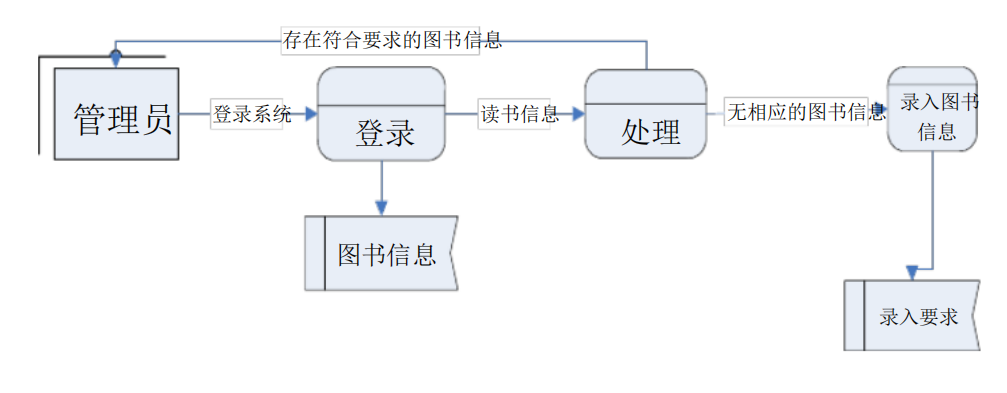


# 1.3整体描述系统用例



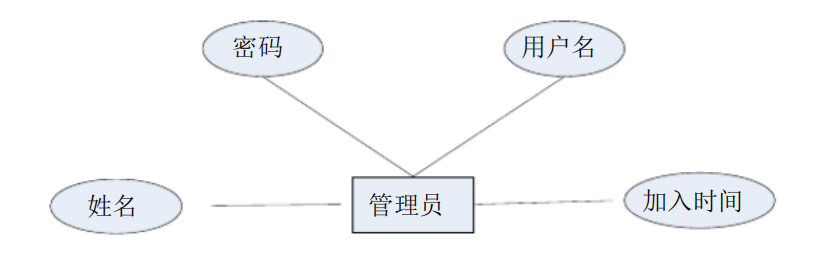
1.4数据流程图



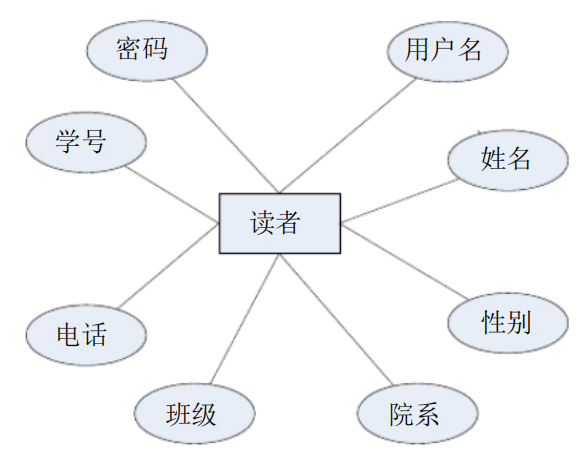


1. 概念结构设计

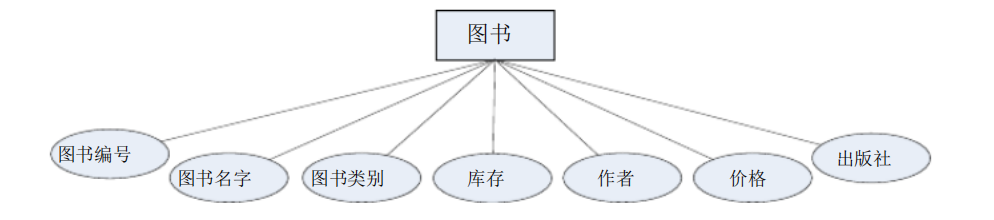
2.1分E-R图



管理员E-R图

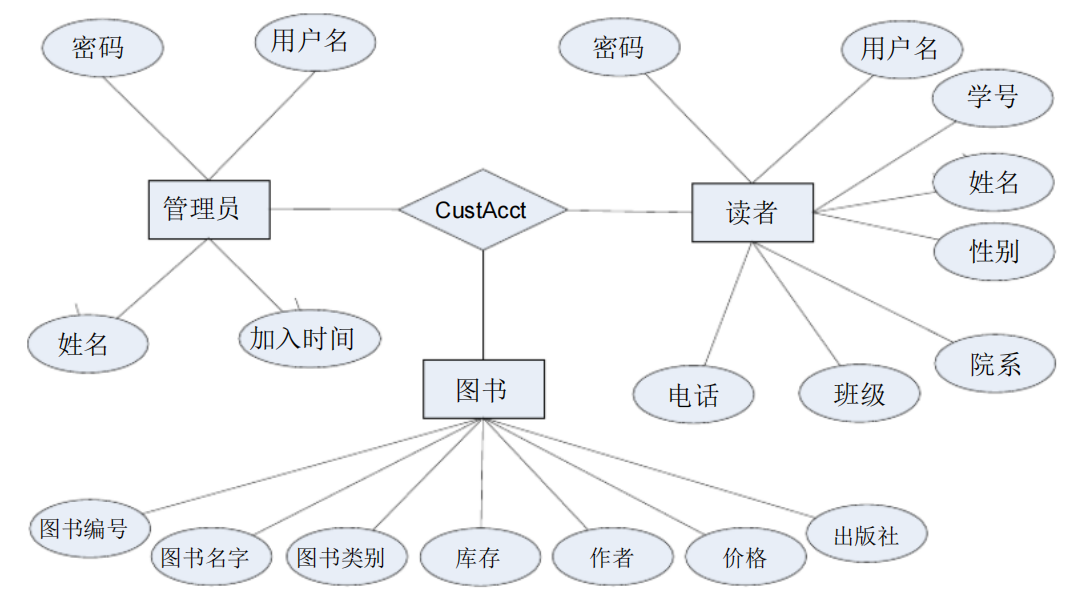


学生E-R图



图书E-R图

2.2总E-R图



总E-R图

设计说明:

上图是该图书管理系统总E-R图，该系统涉及的实体集有:

学生实体集:具有属性用户名、密码、学号，姓名，性别，院系、班级、电话

图书实体集:具有属性图书ISBN编号、图书书名、作者、出版社、定价、图书类别管理员实体集:具有属性用户名、密码、姓名、加入时间

一个学生可以借阅和归还多本图书，所以学生和图书之间的联系为1:n的联系。

一个管理员可以对多本图书进行管理，图书管理员可以有多个，

所以管理员和图书之间的联系为m:n的联系。

一个管理员可以对多个读者进行管理，图书管理员可以有多个，

所以管理员和学生之间的联系为m:n的联系。

1. 关系模式

将概念模型转换成关系模式

(1)图书实体集可以转换为关系:

tBook(cBooksISBN,cBooksName,cBooksAuthor,cBooksType,cBooksPrice,cBooksPublisher,cBooksStore,cBooksISBN 表示图书编号，cBooksName表示图书名称，cBooksAuthor表示图书作者，cBooksType表示图书类型，cBooksPrice表示图书价格，cBooksPublisher表示图书出版社，CBooksStore表示图书库存量

(2)读者实体集可以转换为关系:

tUser(cUsersID,cUsersPwd,cUsersNo,cUsersName,cUsersSex,cUsersDepartcUsersClass,cUsersTeb,cUsersID表示读者用户名，cUsersPwd表示用户密码，cUsersNo表示读者学号，cUsersName表示读者姓名，cUsersSex表示读者性别，cUsersDepart表示读者院系，cUsersClass表示读者班级，cUsersTel表示读者电话

(3)管理员实体集可以转换为关系:

tAdmin( cAdminID , cAdminPwd ,cAdminName，cAdminAddTime)cAdminID表示管理员用户名，cAdminPwd表示密码，cAdminName表示管理员姓名，cAdminAddTime表示管理员加入时间。

(4)因为学生和图书之间的联系为1: n的联系，所以tUser (cUsersID，cBookslSBN)

cBooksISBN表示学生借阅的图书。

(5)因为管理员和图书之间的联系为m: n的联系，以:tAdmin(cAdminID,cBooksISBN)

cBooksISBN表示管理员管理的图书。

1. 因为管理员和学生之间的联系为m: n的联系，所以:tAdmin(cAdminID ,cUsersID)cUsersID表示管理员管理的学生。
2. 物理结构设计

依据关系模式，并结合以上E-R图，经过转化，即可进行数据库的物理设计。该系统的数据库采用Oracle，基于以上数据库的逻辑设计，本系统决定采用一个数据库，在其下创建5个数据表，其结构分别如下:

4.1管理员信息表

表4-1管理员信息表( tAdmin）的结构

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 表名 | tAdmin | | | | | |
| 字段编号 | 字段编号 | 逻辑字段 | 字段类型 | 是否主键 | 是否非空 | 备注 |
| 1 | 用户名 | cAdminID | VARCHAR2 | Y | 非空 |  |
| 2 | 密码 | cAdminPwd | VARCHAR2 |  | 非空 |  |
| 3 | 姓名 | cAdminName | VARCHAR2 |  | 非空 |  |
| 4 | 性别 | cAdminSex | VARCHAR2 |  | 可为空 |  |
| 5 | 加入时间 | cAdminAddTime | VARCHAR2 |  | 可为空 |  |

4.2读者信息表

表4-2读者信息表( tUser）的结构

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 表名 | tUser | | | | | |
| 字段编号 | 字段编号 | 逻辑字段 | 字段类型 | 是否主键 | 是否非空 | 备注 |
| 1 | 用户名 | cAdminID | VARCHAR2 | Y | 非空 |  |
| 2 | 密码 | cAdminPwd | VARCHAR2 |  | 非空 |  |
| 3 | 读者学号 | cUsersNo | VARCHAR2 |  | 非空 |  |
| 4 | 读者姓名 | cAdminName | VARCHAR2 |  | 非空 |  |
| 5 | 读者性别 | cAdminSex | VARCHAR2 |  | 非空 |  |
| 6 | 读者系别 | cUsersDepart | VARCHAR2 |  | 可为空 |  |
| 7 | 读者班级 | cUsersClass | VARCHAR2 |  | 可为空 |  |
| 8 | 读者电话 | cUsersTel | VARCHAR2 |  | 可为空 |  |

4.3读者信息表

表4-3图书馆信息表( tBook）的结构

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 表名 | tBook | | | | | |
| 字段编号 | 字段编号 | 逻辑字段 | 字段类型 | 是否主键 | 是否非空 | 备注 |
| 1 | 图书编号 | cBooksISBN | VARCHAR2 | Y | 非空 |  |
| 2 | 图书名称 | cBooksName | VARCHAR2 |  | 非空 |  |
| 3 | 图书作者 | cBooksAuthor | VARCHAR2 |  | 可为空 |  |
| 3 | 图书类型 | cBooksType | VARCHAR2 |  | 可为空 |  |
| 4 | 图书价格 | cBooksPrice | 货币 |  | 可为空 |  |
| 5 | 图书出版社 | cBooksPublisher | VARCHAR2 |  | 可为空 |  |
| 7 | 图书库存量 | cBooksStore | 整数 |  | 可为空 |  |

4.4图书借阅登记表

表4-4图书借阅登记表( tBorrow）的结构

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 表名 | tBorrow | | | | | |
| 字段编号 | 字段编号 | 逻辑字段 | 字段类型 | 是否主键 | 是否非空 | 备注 |
| 1 | 读者学号 | cUsersNo | VARCHAR2 | Y | 非空 |  |
| 2 | 读者姓名 | cAdminName | VARCHAR2 |  | 非空 |  |
| 3 | 图书编号 | cBooksISBN | VARCHAR2 |  | 非空 |  |
| 4 | 图书名称 | cBooksName | VARCHAR2 |  | 非空 |  |
| 5 | 已借数目 | vcUsersBorrow | VARCHAR2 |  | 非空 |  |

4.5图书归还登记表

表4-5图书归还登记表( tReturn）的结构

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 表名 | tReturn | | | | | |
| 字段编号 | 字段编号 | 逻辑字段 | 字段类型 | 是否主键 | 是否非空 | 备注 |
| 1 | 读者学号 | cUsersNo | VARCHAR2 | Y | 非空 |  |
| 2 | 读者姓名 | cAdminName | VARCHAR2 |  | 非空 |  |
| 3 | 图书编号 | cBooksISBN | VARCHAR2 |  | 非空 |  |
| 4 | 图书名称 | cBooksName | VARCHAR2 |  | 非空 |  |
| 5 | 借书时间 | cBorrwTime | 时间日期 |  | 非空 |  |
| 6 | 还书时间 | cReturnTime | 时间日期 |  | 非空 |  |

1. 数据库实施代码

5.1 创建数据库并创建数据表

建管理员表

create table tAdmin

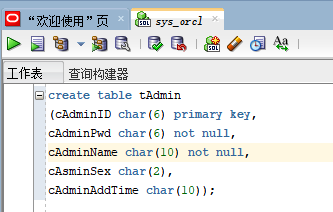
(cAdminID char(6) primary key,

cAdminPwd char(6) not null,

cAdminName char(10) not null,

cAsminSex char(2),

cAdminAddTime char(10));



5.2创建space01

CREATE TABLESPACE space01 DATAFILE

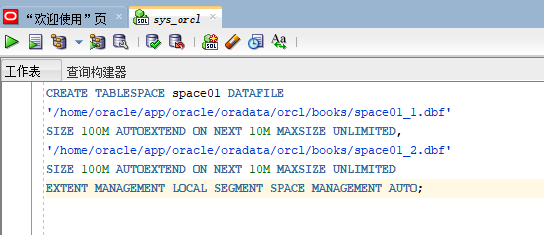
'/home/oracle/app/oracle/oradata/orcl/books/space01\_1.dbf'

SIZE 100M AUTOEXTEND ON NEXT 10M MAXSIZE UNLIMITED,

'/home/oracle/app/oracle/oradata/orcl/books/space01\_2.dbf'

SIZE 100M AUTOEXTEND ON NEXT 10M MAXSIZE UNLIMITED

EXTENT MANAGEMENT LOCAL SEGMENT SPACE MANAGEMENT AUTO;



5.3创建表空间sapce02

CREATE TABLESPACE space02 DATAFILE

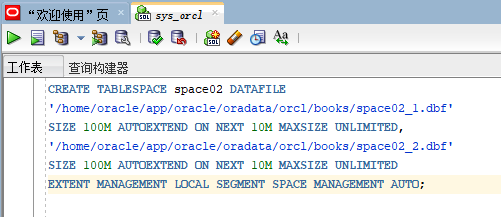
'/home/oracle/app/oracle/oradata/orcl/books/space02\_1.dbf'

SIZE 100M AUTOEXTEND ON NEXT 10M MAXSIZE UNLIMITED,

'/home/oracle/app/oracle/oradata/orcl/books/space02\_2.dbf'

SIZE 100M AUTOEXTEND ON NEXT 10M MAXSIZE UNLIMITED

EXTENT MANAGEMENT LOCAL SEGMENT SPACE MANAGEMENT AUTO;



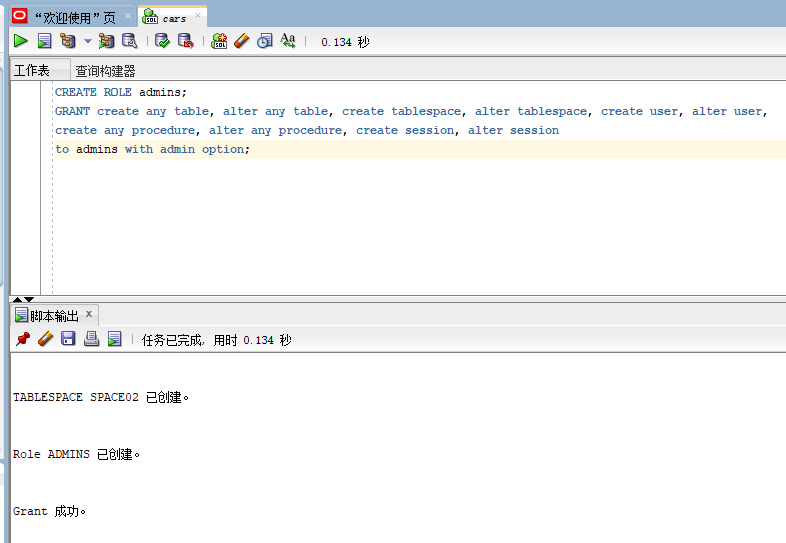
5.4创建管理员角色

CREATE ROLE admins;

GRANT create any table, alter any table, create tablespace, alter tablespace, create user, alter user,

create any procedure, alter any procedure, create session, alter session

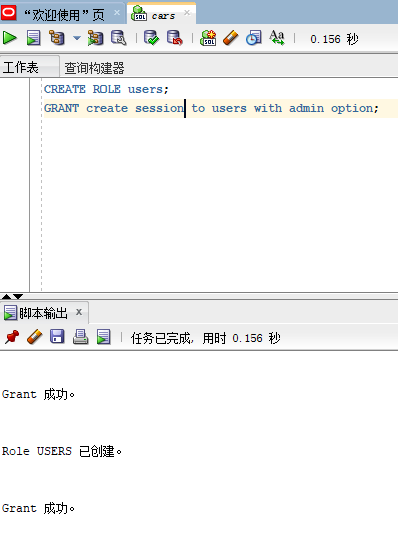
to admins with admin option;



5.5创建用户角色

CREATE ROLE users;

GRANT create session to users with admin option;



5.6创建管理员用户

创建管理员用户admin\_01,并赋予它所有权限

GRANT "DBA" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "C##CON\_RES" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DV\_MONITOR" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "CTXAPP" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DV\_AUDIT\_CLEANUP" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "SPATIAL\_CSW\_admin\_01" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "APEX\_GRANTS\_FOR\_NEW\_USERS\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "WFS\_USR\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "EM\_EXPRESS\_ALL" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "WM\_admin\_01\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "OLAP\_USER" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "OLAP\_XS\_admin\_01" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DV\_SECANALYST" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "CSW\_USR\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "XS\_CACHE\_admin\_01" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "GDS\_CATALOG\_SELECT" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "SCHEDULER\_admin\_01" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "PROVISIONER" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "AUDIT\_admin\_01" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "XDB\_WEBSERVICES\_OVER\_HTTP" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DV\_REALM\_RESOURCE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "AQ\_admin\_01ISTRATOR\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DELETE\_CATALOG\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "CON\_RES" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "XDB\_WEBSERVICES" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DV\_PUBLIC" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "LBAC\_DBA" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "OPTIMIZER\_PROCESSING\_RATE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "RECOVERY\_CATALOG\_USER" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DV\_DATAPUMP\_NETWORK\_LINK" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "GSMUSER\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "GATHER\_SYSTEM\_STATISTICS" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "LOGSTDBY\_admin\_01ISTRATOR" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "GSM\_POOLadmin\_01\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DV\_admin\_01" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "HS\_admin\_01\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "XS\_SESSION\_admin\_01" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DV\_GOLDENGATE\_admin\_01" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "IMP\_FULL\_DATABASE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DV\_XSTREAM\_admin\_01" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DV\_PATCH\_admin\_01" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DATAPUMP\_EXP\_FULL\_DATABASE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "EJBCLIENT" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "HS\_admin\_01\_EXECUTE\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "JMXSERVER" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "OLAP\_DBA" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "ADM\_PARALLEL\_EXECUTE\_TASK" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "JAVAIDPRIV" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "SELECT\_CATALOG\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "JAVADEBUGPRIV" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "CONNECT" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DATAPUMP\_IMP\_FULL\_DATABASE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "OEM\_MONITOR" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "APEX\_admin\_01ISTRATOR\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "GSMadmin\_01\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "AQ\_USER\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "JAVAUSERPRIV" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "XDB\_SET\_INVOKER" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "RECOVERY\_CATALOG\_OWNER" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "JAVA\_admin\_01" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DBFS\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "PDB\_DBA" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DV\_GOLDENGATE\_REDO\_ACCESS" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "CDB\_DBA" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "JAVASYSPRIV" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "HS\_admin\_01\_SELECT\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "AUDIT\_VIEWER" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "RESOURCE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DV\_OWNER" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "XDB\_WEBSERVICES\_WITH\_PUBLIC" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "EXECUTE\_CATALOG\_ROLE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DV\_ACCTMGR" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DV\_REALM\_OWNER" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "EXP\_FULL\_DATABASE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DV\_STREAMS\_admin\_01" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "JAVA\_DEPLOY" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "SPATIAL\_WFS\_admin\_01" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "XS\_NAMESPACE\_admin\_01" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "DEV" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "XS\_RESOURCE" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "ORDadmin\_01" TO "admin\_01" WITH admin\_01 OPTION;

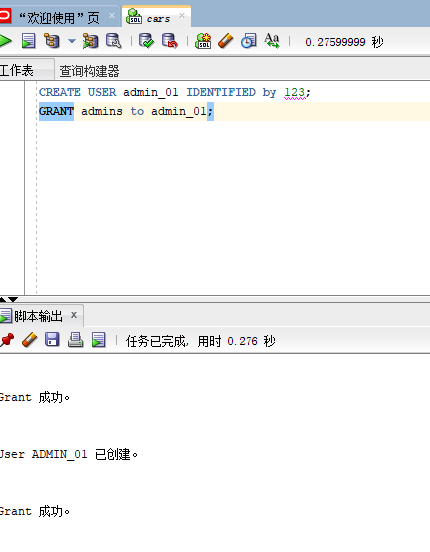
GRANT "AUTHENTICATEDUSER" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "CAPTURE\_admin\_01" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "OEM\_ADVISOR" TO "admin\_01" WITH admin\_01 OPTION;

GRANT "XDBadmin\_01" TO "admin\_01" WITH admin\_01 OPTION;

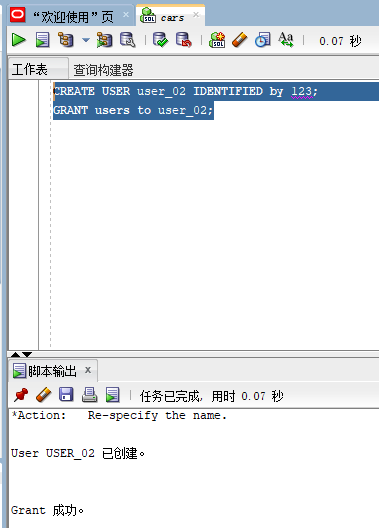
GRANT "EM\_EXPRESS\_BASIC" TO "admin\_01" WITH admin\_01 OPTION;



5.7创建普通用户的用户

CREATE USER user\_02 IDENTIFIED by 123;

GRANT users to user\_02;



1. 创建表及插入数据

6.1板块表

DROP TABLE Bankuai;

CREATE TABLE Bankuai (

"name" VARCHAR2(255 BYTE) VISIBLE NOT NULL ,

"introduction" VARCHAR2(255 BYTE) VISIBLE NOT NULL

)

TABLESPACE "SPACE01"

LOGGING

NOCOMPRESS

PCTFREE 10

INITRANS 1

STORAGE (

BUFFER\_POOL DEFAULT

)

PARALLEL 1

NOCACHE

DISABLE ROW MOVEMENT

;

COMMENT ON COLUMN Bankuai."name" IS '板块名';

COMMENT ON COLUMN Bankuai."introduction" IS '板块的描述';

ALTER TABLE Bankuai ADD CONSTRAINT "SYS\_C0038651" PRIMARY KEY ("name");

-- ----------------------------

-- Checks structure for table Bankuai

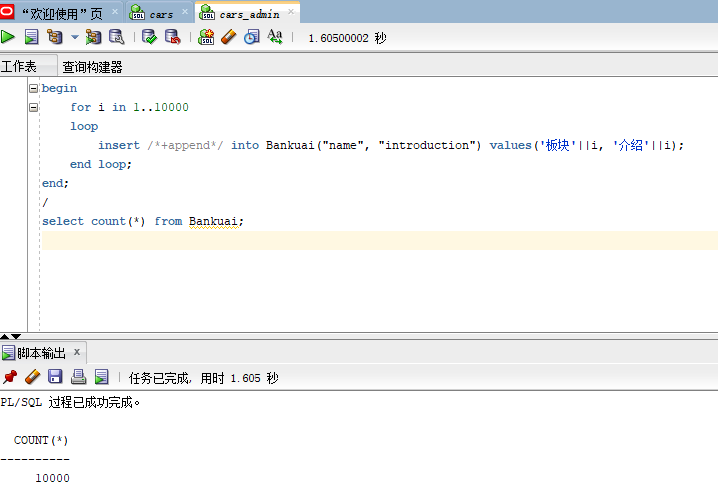
-- ----------------------------

ALTER TABLE Bankuai ADD CONSTRAINT "SYS\_C0038649" CHECK ("name" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

ALTER TABLE Bankuai ADD CONSTRAINT "SYS\_C0038650" CHECK ("introduction" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 表名 | Bankuai | | | | | |
| 字段编号 | 物理字段 | 逻辑字段 | 字段类型 | 是否主键 | 是否非空 | 备注 |
| 1 | 版块名 | name | VARCHAR2 | Y | 非空 |  |
| 2 | 板块描述 | instruction | VARCHAR2 |  | 非空 |  |

插入数据



6.2话题表

DROP TABLE post;

CREATE TABLE post (

"id" NUMBER VISIBLE NOT NULL ,

"name" VARCHAR2(255 BYTE) VISIBLE NOT NULL ,

"user\_id" NUMBER VISIBLE NOT NULL ,

"title" VARCHAR2(255 BYTE) VISIBLE NOT NULL ,

"details" VARCHAR2(255 BYTE) VISIBLE NOT NULL ,

"time" DATE VISIBLE NOT NULL

)

TABLESPACE "SPACE01"

LOGGING

NOCOMPRESS

PCTFREE 10

INITRANS 1

STORAGE (

BUFFER\_POOL DEFAULT

)

PARALLEL 1

NOCACHE

DISABLE ROW MOVEMENT

;

COMMENT ON COLUMN post."id" IS '话题id';

COMMENT ON COLUMN post."name" IS '所属板块名';

COMMENT ON COLUMN post."user\_id" IS '发帖人id';

COMMENT ON COLUMN post."title" IS '话题标题';

COMMENT ON COLUMN post."details" IS '话题细节';

COMMENT ON COLUMN post."time" IS '提起时间';

ALTER TABLE post ADD CONSTRAINT "SYS\_C0038667" PRIMARY KEY ("id");

-- ----------------------------

-- Checks structure for table post

-- ----------------------------

ALTER TABLE post ADD CONSTRAINT "SYS\_C0038661" CHECK ("id" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

ALTER TABLE post ADD CONSTRAINT "SYS\_C0038662" CHECK ("name" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

ALTER TABLE post ADD CONSTRAINT "SYS\_C0038663" CHECK ("user\_id" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

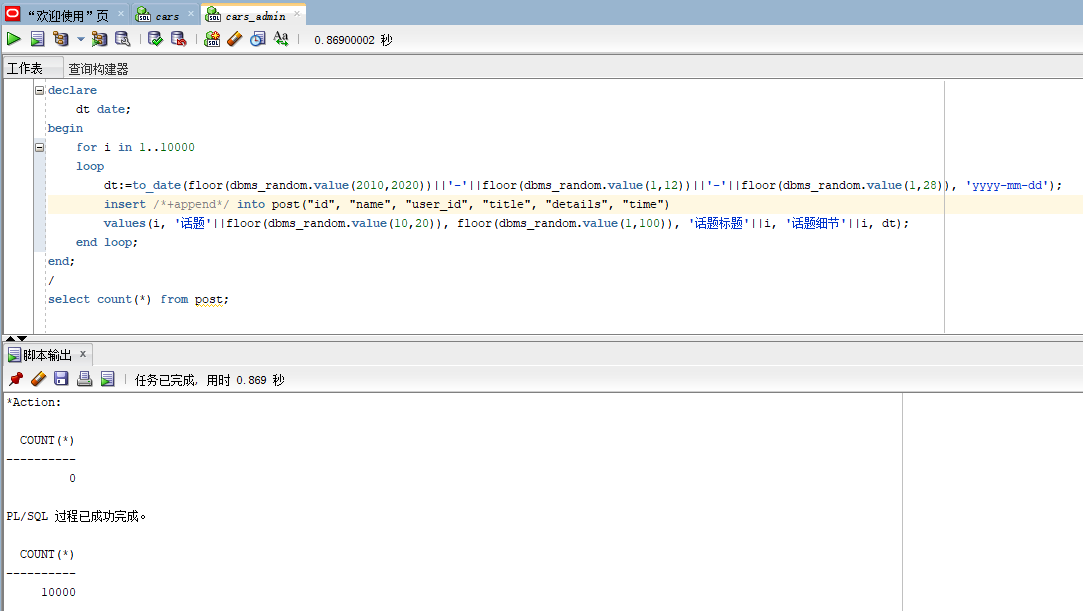
ALTER TABLE post ADD CONSTRAINT "SYS\_C0038664" CHECK ("title" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

ALTER TABLE post ADD CONSTRAINT "SYS\_C0038665" CHECK ("details" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

ALTER TABLE post ADD CONSTRAINT "SYS\_C0038666" CHECK ("time" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 表名 | post | | | | | |
| 字段编号 | 物理字段 | 逻辑字段 | 字段类型 | 是否主键 | 是否非空 | 备注 |
| 1 | 话题id | id | NUMBER | Y | 非空 |  |
| 2 | 所属板块名 | name | VARCHAR2 |  | 非空 |  |
| 3 | 发帖人id | User\_id | NUMBER |  | 非空 |  |
| 4 | 话题标题 | title | VARCHAR2 |  | 非空 |  |
| 5 | 话题细节 | details | VARCHAR2 |  | 非空 |  |
| 6 | 提起时间 | time | DATE |  | 非空 |  |

插入数据



6.3回复表1

DROP TABLE reply\_one;

CREATE TABLE reply\_one (

"id" NUMBER VISIBLE NOT NULL ,

"post\_id" NUMBER VISIBLE NOT NULL ,

"user\_id" NUMBER VISIBLE NOT NULL ,

"details" VARCHAR2(255 BYTE) VISIBLE NOT NULL ,

"time" DATE VISIBLE NOT NULL

)

TABLESPACE "SPACE01"

LOGGING

NOCOMPRESS

PCTFREE 10

INITRANS 1

STORAGE (

BUFFER\_POOL DEFAULT

)

PARALLEL 1

NOCACHE

DISABLE ROW MOVEMENT

;

COMMENT ON COLUMN reply\_one."id" IS '回复id';

COMMENT ON COLUMN reply\_one."post\_id" IS '话题id';

COMMENT ON COLUMN reply\_one."user\_id" IS '回复用户id';

COMMENT ON COLUMN reply\_one."details" IS '回复内容';

COMMENT ON COLUMN reply\_one."time" IS '回复时间';

ALTER TABLE reply\_one ADD CONSTRAINT "SYS\_C0038673" PRIMARY KEY ("id", "post\_id");

-- ----------------------------

-- Checks structure for table reply\_one

-- ----------------------------

ALTER TABLE reply\_one ADD CONSTRAINT "SYS\_C0038668" CHECK ("id" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

ALTER TABLE reply\_one ADD CONSTRAINT "SYS\_C0038669" CHECK ("post\_id" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

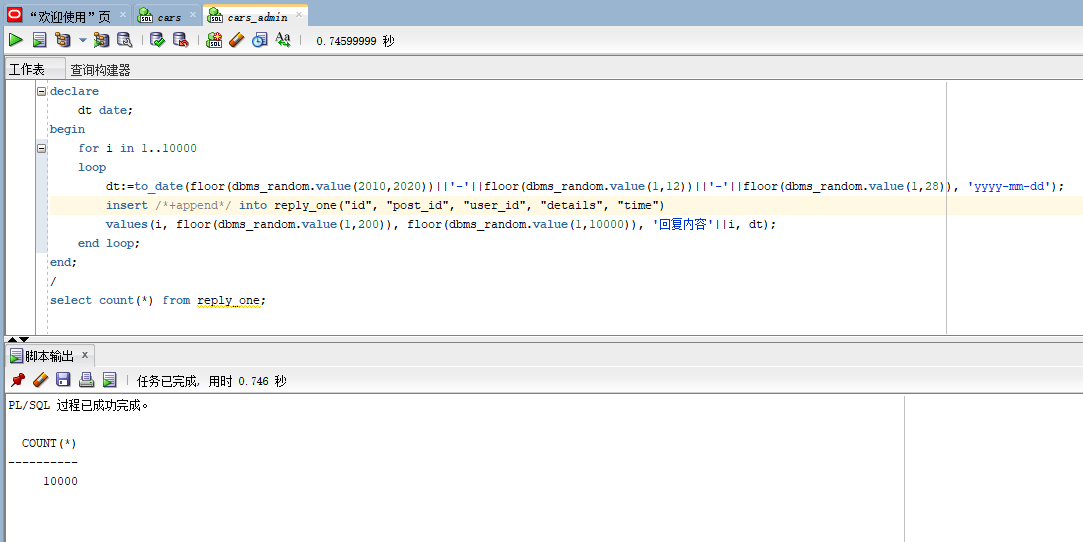
ALTER TABLE reply\_one ADD CONSTRAINT "SYS\_C0038670" CHECK ("user\_id" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

ALTER TABLE reply\_one ADD CONSTRAINT "SYS\_C0038671" CHECK ("details" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

ALTER TABLE reply\_one ADD CONSTRAINT "SYS\_C0038672" CHECK ("time" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 表名 | reply\_one | | | | | |
| 字段编号 | 物理字段 | 逻辑字段 | 字段类型 | 是否主键 | 是否非空 | 备注 |
| 1 | 回复id | id | NUMBER | Y | 非空 |  |
| 2 | 话题id | post\_id | NUMBER | Y | 非空 |  |
| 3 | 回复用户id | User\_id | NUMBER |  | 非空 |  |
| 4 | 回复内容 | details | VARCHAR2 |  | 非空 |  |
| 5 | 回复时间 | time | DATE |  | 非空 |  |

插入数据



6.4回复表2

DROP TABLE reply\_two;

CREATE TABLE reply\_two (

"id" NUMBER VISIBLE NOT NULL ,

"post\_id" NUMBER VISIBLE NOT NULL ,

"reply\_id" NUMBER VISIBLE NOT NULL ,

"user\_id" NUMBER VISIBLE NOT NULL ,

"details" VARCHAR2(255 BYTE) VISIBLE NOT NULL ,

"time" DATE VISIBLE NOT NULL

)

TABLESPACE "SPACE01"

LOGGING

NOCOMPRESS

PCTFREE 10

INITRANS 1

STORAGE (

BUFFER\_POOL DEFAULT

)

PARALLEL 1

NOCACHE

DISABLE ROW MOVEMENT

;

COMMENT ON COLUMN reply\_two."id" IS '再次回复的id';

COMMENT ON COLUMN reply\_two."post\_id" IS '话题id';

COMMENT ON COLUMN reply\_two."reply\_id" IS '回复的id';

COMMENT ON COLUMN reply\_two."user\_id" IS '用户id';

COMMENT ON COLUMN reply\_two."details" IS '回复内容';

COMMENT ON COLUMN reply\_two."time" IS '回复时间';

ALTER TABLE reply\_two ADD CONSTRAINT "SYS\_C0038680" PRIMARY KEY ("id", "post\_id", "reply\_id");

-- ----------------------------

-- Checks structure for table reply\_two

-- ----------------------------

ALTER TABLE reply\_two ADD CONSTRAINT "SYS\_C0038674" CHECK ("id" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

ALTER TABLE reply\_two ADD CONSTRAINT "SYS\_C0038675" CHECK ("post\_id" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

ALTER TABLE reply\_two ADD CONSTRAINT "SYS\_C0038676" CHECK ("reply\_id" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

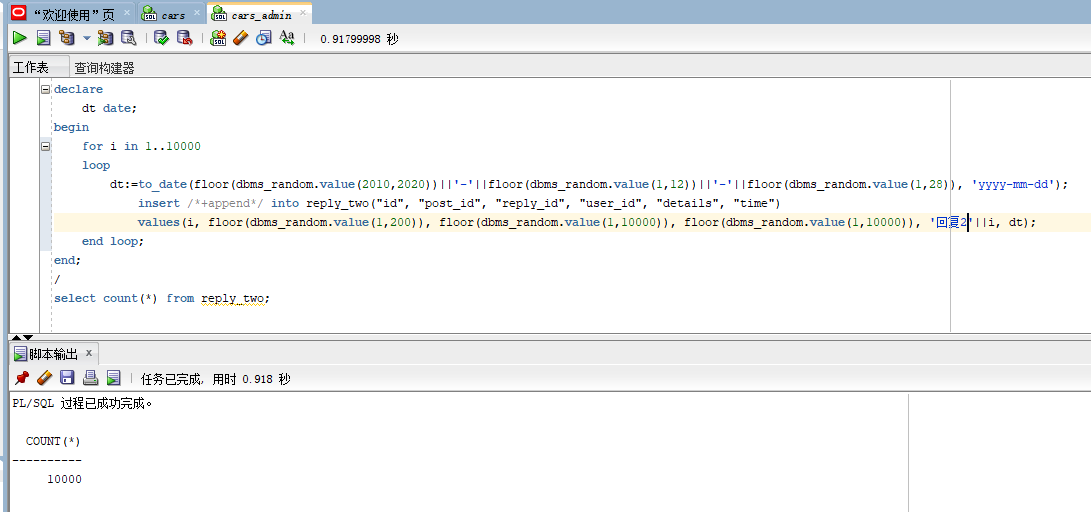
ALTER TABLE reply\_two ADD CONSTRAINT "SYS\_C0038677" CHECK ("user\_id" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

ALTER TABLE reply\_two ADD CONSTRAINT "SYS\_C0038678" CHECK ("details" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

ALTER TABLE reply\_two ADD CONSTRAINT "SYS\_C0038679" CHECK ("time" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 表名 | reply\_two | | | | | |
| 字段编号 | 物理字段 | 逻辑字段 | 字段类型 | 是否主键 | 是否非空 | 备注 |
| 1 | 再次回复的id | id | NUMBER | Y | 非空 |  |
| 2 | 话题id | post\_id | NUMBER | Y | 非空 |  |
| 3 | 回复的id | reply\_id | NUMBER | Y | 非空 |  |
| 4 | 回复用户id | user\_id | NUMBER |  | 非空 |  |
| 5 | 回复内容 | details | VARCHAR2 |  | 非空 |  |
| 6 | 回复时间 | time | DATE |  |  |  |

插入数据



6.5用户表

DROP TABLE user\_table;

CREATE TABLE user\_table (

"id" NUMBER VISIBLE NOT NULL ,

"user\_name" VARCHAR2(255 BYTE) VISIBLE NOT NULL ,

"sex" VARCHAR2(255 BYTE) VISIBLE

)

TABLESPACE "SPACE01"

LOGGING

NOCOMPRESS

PCTFREE 10

INITRANS 1

STORAGE (

BUFFER\_POOL DEFAULT

)

PARALLEL 1

NOCACHE

DISABLE ROW MOVEMENT

;

COMMENT ON COLUMN user\_table."id" IS '用户id';

COMMENT ON COLUMN user\_table."user\_name" IS '用户名';

COMMENT ON COLUMN user\_table."sex" IS '用户性别';

ALTER TABLE user\_table ADD CONSTRAINT "SYS\_C0038687" PRIMARY KEY ("id");

-- ----------------------------

-- Checks structure for table user\_table

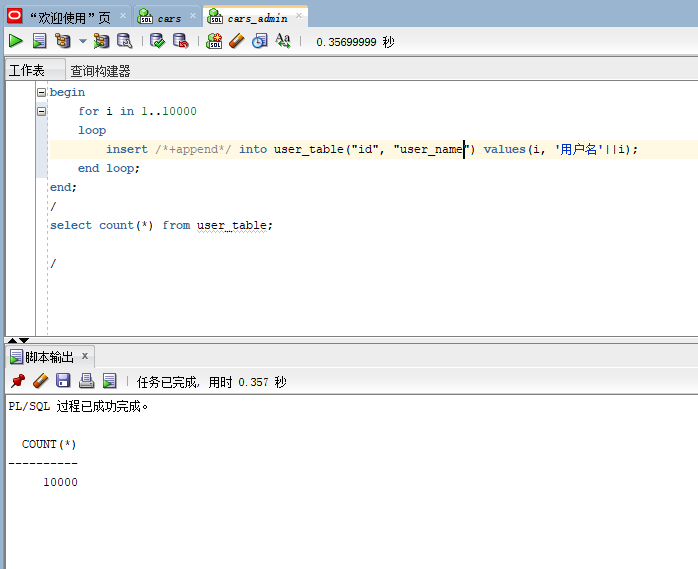
-- ----------------------------

ALTER TABLE user\_table ADD CONSTRAINT "SYS\_C0038685" CHECK ("id" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

ALTER TABLE user\_table ADD CONSTRAINT "SYS\_C0038686" CHECK ("user\_name" IS NOT NULL) NOT DEFERRABLE INITIALLY IMMEDIATE NORELY VALIDATE;

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 表名 | user\_table | | | | | |
| 字段编号 | 物理字段 | 逻辑字段 | 字段类型 | 是否主键 | 是否非空 | 备注 |
| 1 | 用户id | id | NUMBER | Y | 非空 |  |
| 2 | 用户名 | user\_name | VARCHAR2 |  | 非空 |  |
| 3 | 用户性别 | sex | VARCHAR2 |  |  |  |

插入数据



1. PL/SQL语言设计存储过程和函数

7.1函数

create or replace PACKAGE MyPack IS

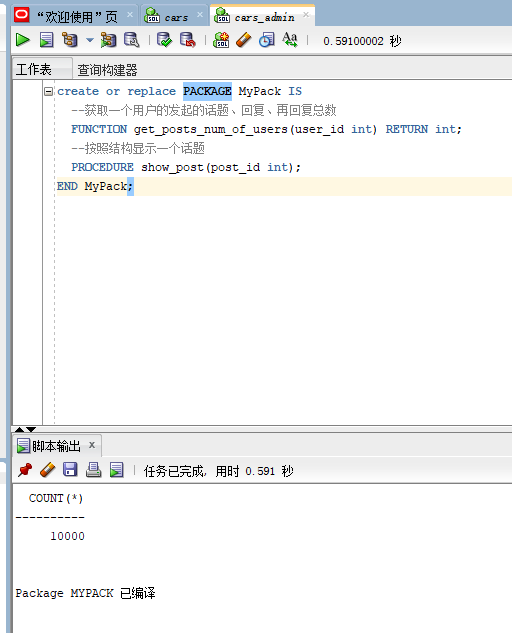
--获取一个用户的发起的话题、回复、再回复总数

FUNCTION get\_posts\_num\_of\_users(user\_id int) RETURN int;

--按照结构显示一个话题

PROCEDURE show\_post(post\_id int);

END MyPack;



存储过程

create or replace PACKAGE BODY MyPack IS

FUNCTION get\_posts\_num\_of\_users(user\_id int) RETURN int

AS

posts int;

reply\_one int;

reply\_two int;

begin

select count(\*) into posts from post where "user\_id" = user\_id;

select count(\*) into reply\_one from post where "user\_id" = user\_id;

select count(\*) into reply\_two from post where "user\_id" = user\_id;

return posts+reply\_one+reply\_two;

end;

PROCEDURE show\_post(post\_id int)

AS

temp varchar2(255);

leftspace varchar2(255);

begin

leftspace:=' ';

select "title" into temp from post where "id"=post\_id;

DBMS\_OUTPUT.PUT\_LINE('标题：'||temp);

select "details" into temp from post where "id"=post\_id;

DBMS\_OUTPUT.PUT\_LINE('细节：'||temp);

for v in (select \* from reply\_one where "post\_id"=post\_id)

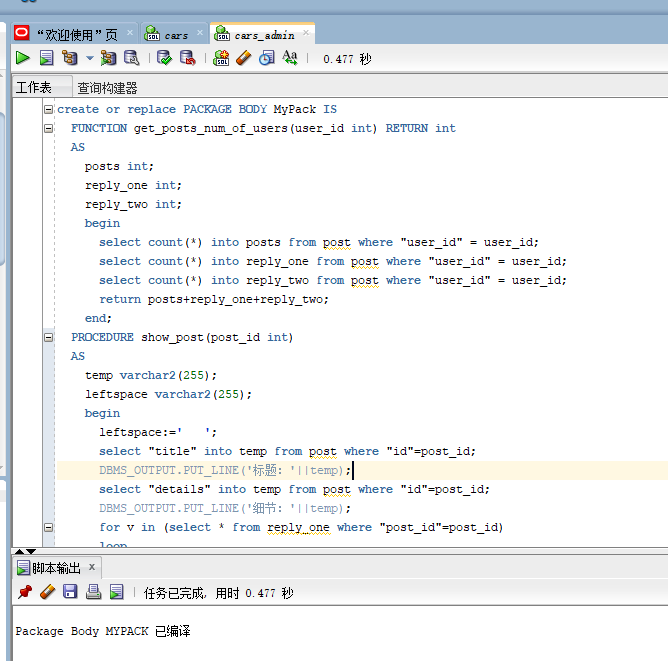
loop

DBMS\_OUTPUT.PUT\_LINE(leftspace||'用户'||v."user\_id"||'回复：'||v."details");

end loop;

END;

END MyPack;



1. 备份方案

数据库备份采取每月一次进行数据库全备份，并且在每日凌晨十二点自动开始增量备份的方式进行备份。

8.1开始全备份

[oracle@oracle-pc ~]$ cat rman\_level0.sh

[oracle@oracle-pc ~]$ ./rman\_level0.sh

每天定时开始增量备份

[oracle@oracle-pc ~]$ cat rman\_level1.sh

[oracle@oracle-pc ~]$ ./rman\_level1.sh

查看备份文件

\*.log是日志文件

dblv0\*.bak是数据库的备份文件

arclv0\*.bak是归档日期的备份文件

c-1392946895-20210610-01是控制文件和参数的备份

[oracle@oracle-pc ~]$ cd rman\_backup

[oracle@oracle-pc rman\_backup]$ ls

arclv0\_ORCL\_20210610\_dauhb2fm\_1\_1.bak

c-1392946895-20210610-01

dblv0\_ORCL\_20210610\_d7uhb2ap\_1\_1.bak

dblv0\_ORCL\_20210610\_d8uhb2c6\_1\_1.bak

dblv0\_ORCL\_20210610\_d9uhb2ei\_1\_1.bak

lv0\_20210610-083949\_L0.log



查看备份文件的内容

[oracle@oracle-pc ~]$ rman target /

RMAN> list backup;

List of Backup Sets

===================

BS Key Type LV Size Device Type Elapsed Time Completion Time

------- ---- -- ---------- ----------- ------------ ---------------275 Incr 0 215.21M DISK 00:00:36 21-06月-10

BP Key: 275 Status: AVAILABLE Compressed: YES Tag: TAG20210610T083953

Piece Name: /home/oracle/rman\_backup/dblv0\_ORCL\_20210610\_d7uhb2ap\_1\_1.bak

List of Datafiles in backup set 275

Container ID: 3, PDB Name: PDBORCL

File LV Type Ckp SCN Ckp Time Name

---- -- ---- ---------- ---------- ----

8 0 Incr 48162290 21-06月-10 /home/oracle/app/oracle/oradata/orcl/cars/system01.dbf

9 0 Incr 48162290 21-06月-10 /home/oracle/app/oracle/oradata/orcl/cars/sysaux01.dbf

10 0 Incr 48162290 21-06月-10 /home/oracle/app/oracle/oradata/orcl/cars/SAMPLE\_SCHEMA\_users01.dbf

11 0 Incr 48162290 21-06月-10 /home/oracle/app/oracle/oradata/orcl/cars/example01.dbf

12 0 Incr 48162290 21-06月-10 /home/oracle/app/oracle/oradata/orcl/cars/space01\_1.dbf

13 0 Incr 48162290 21-06月-10 /home/oracle/app/oracle/oradata/orcl/cars/space01\_2.dbf

16 0 Incr 48162290 21-06月-10 /home/oracle/app/oracle/oradata/orcl/cars/space01\_3.dbf

17 0 Incr 48162290 21-06月-10 /home/oracle/app/oracle/oradata/orcl/cars/space01\_4.dbf

77 0 Incr 48162290 21-06月-10 /home/oracle/app/oracle/oradata/orcl/cars/space02\_1.dbf

78 0 Incr 48162290 21-06月-10 /home/oracle/app/oracle/oradata/orcl/cars/space02\_2.dbf

BS Key Type LV Size Device Type Elapsed Time Completion Time

------- ---- -- ---------- ----------- ------------ ---------------276 Incr 0 368.46M DISK 00:01:12 21-06月-10

BP Key: 276 Status: AVAILABLE Compressed: YES Tag: TAG20210610T083953

Piece Name: /home/oracle/rman\_backup/dblv0\_ORCL\_20210610\_d8uhb2c6\_1\_1.bak

List of Datafiles in backup set 276

File LV Type Ckp SCN Ckp Time Name

---- -- ---- ---------- ---------- ----

1 0 Incr 48162395 21-06月-10 /home/oracle/app/oracle/oradata/orcl/system01.dbf

3 0 Incr 48162395 21-06月-10 /home/oracle/app/oracle/oradata/orcl/sysaux01.dbf

4 0 Incr 48162395 21-06月-10 /home/oracle/app/oracle/oradata/orcl/undotbs01.dbf

6 0 Incr 48162395 21-06月-10 /home/oracle/app/oracle/oradata/orcl/users01.dbf

BS Key Type LV Size Device Type Elapsed Time Completion Time

------- ---- -- ---------- ----------- ------------ ---------------277 Incr 0 157.08M DISK 00:00:26 21-06月-10

BP Key: 277 Status: AVAILABLE Compressed: YES Tag: TAG20210610T083953

Piece Name: /home/oracle/rman\_backup/dblv0\_ORCL\_20210610\_d9uhb2ei\_1\_1.bak

List of Datafiles in backup set 277

Container ID: 2, PDB Name: PDB$SEED

File LV Type Ckp SCN Ckp Time Name

---- -- ---- ---------- ---------- ----

5 0 Incr 1819408 01-12月-14 /home/oracle/app/oracle/oradata/orcl/pdbseed/system01.dbf

7 0 Incr 1819408 01-12月-14 /home/oracle/app/oracle/oradata/orcl/pdbseed/sysaux01.dbf

BS Key Size Device Type Elapsed Time Completion Time

------- ---------- ----------- ------------ ---------------278 103.50K DISK 00:00:00 21-06月-10

BP Key: 278 Status: AVAILABLE Compressed: YES Tag: TAG20210610T084230

Piece Name: /home/oracle/rman\_backup/arclv0\_ORCL\_20210610\_dauhb2fm\_1\_1.bak

List of Archived Logs in backup set 278

Thrd Seq Low SCN Low Time Next SCN Next Time

---- ------- ---------- ---------- ---------- ---------

1 1679 48162279 21-06月-10 48162608 21-06月-10

BS Key Type LV Size Device Type Elapsed Time Completion Time

------- ---- -- ---------- ----------- ------------ ---------------279 Full 17.77M DISK 00:00:01 21-06月-10

BP Key: 279 Status: AVAILABLE Compressed: NO Tag: TAG20210610T084231

Piece Name: /home/oracle/rman\_backup/c-1392946895-20210610-01

SPFILE Included: Modification time: 21-06月-10

SPFILE db\_unique\_name: ORCL

Control File Included: Ckp SCN: 48162622 Ckp time: 21-06月-10

由上面的"list backup;" 输出可以看出，备份集中的文件内容是：

/home/oracle/rman\_backup/dblv0\_ORCL\_20210610\_d7uhb2ap\_1\_1.bak 是插接数据库PDBORCL的备份集

/home/oracle/rman\_backup/dblv0\_ORCL\_20210610\_d8uhb2c6\_1\_1.bak 是ORCL的备份集

/home/oracle/rman\_backup/dblv0\_ORCL\_20210610\_d9uhb2ei\_1\_1.bak是PDB$SEED的备份集

/home/oracle/rman\_backup/arclv0\_ORCL\_20210610\_dauhb2fm\_1\_1.bak是归档文件的备份集

/home/oracle/rman\_backup/c-1392946895-20210610-01是参数文件(SPFILE)和控制文件(Control File)的备份集

8.2备份后修改数据

[oracle@oracle-pc ~]$ sqlplus study/123@pdborcl

SQL> create table t1 (id number,name varchar2(50));

Table created.

SQL> insert into t1 values(1,'zhang');1 row created.

SQL> commit;

Commit complete.

SQL> select \* from t1;

ID NAME

---------- --------------------------------------------------

1 zhang

SQL> exit

8.3删除数据库文件，模拟数据库文件损坏

[oracle@oracle-pc ~]$ rm /home/oracle/app/oracle/oradata/orcl/cars/SAMPLE\_SCHEMA\_users01.dbf

删除数据库文件后修改数据

删除数据文件后，仍然可以增加一条数据。这是因为增加的数据并没有写入数据文件，而是写到了日志文件中。如果增加的数据较多的时候，就会出问题了。

[oracle@oracle-pc ~]$ sqlplus study/123@pdborcl

SQL> insert into t1 values(2,'wang');1 row created.

SQL> commit;

Commit complete.

SQL> select \* from t1;

ID NAME

---------- --------------------------------------------------

1 zhang

2 wang

SQL>

SQL> declare

2 n number;

3 begin

4 for n in 1..10000 loop

5 insert into t1 values(n,'name'||n);

6 end loop;

7 end;

8 /

declare

\*

ERROR at line 1:

ORA-01116: 打开数据库文件 10 时出错 ORA-01110:

数据文件 10: '/home/oracle/app/oracle/oradata/orcl/cars/SAMPLE\_SCHEMA\_users01.dbf'

ORA-27041: 无法打开文件

Linux-x86\_64 Error: 2: No such file or directory

Additional information: 3

ORA-06512: 在 line 5

SQL> select \* from t1;

ID NAME

---------- --------------------------------------------------

1 zhang

2 wang

SQL> exit

8.4数据库完全恢复

4.1 重启损坏的数据库到mount状态

通过shutdown immediate无法正常关闭数据库，只能通过shutdown abort强制关闭。然后将数据库启动到mount状态。

[oracle@oracle-pc ~]$ sqlplus / as sysdba

SQL> shutdown immediate

ORA-01116: 打开数据库文件 10 时出错

ORA-01110: 数据文件 10: '/home/oracle/app/oracle/oradata/orcl/cars/SAMPLE\_SCHEMA\_users01.dbf'

ORA-27041: 无法打开文件

Linux-x86\_64 Error: 2: No such file or directory

Additional information: 3

SQL> shutdown abort

ORACLE instance shut down.

SQL> startup mount

ORACLE instance started.

Total System Global Area 1577058304 bytes

Fixed Size 2924832 bytes

Variable Size 738201312 bytes

Database Buffers 654311424 bytes

Redo Buffers 13848576 bytes

In-Memory Area 167772160 bytes

Database mounted.

SQL> exit

4.2 开始恢复数据库

[oracle@oracle-pc ~]$ rman target /

RMAN> restore database ;

Starting restore at 221-06月-10using target database control file instead of recovery catalog

allocated channel: ORA\_DISK\_1

channel ORA\_DISK\_1: SID=243 device type=DISK

skipping datafile 5; already restored to file /home/oracle/app/oracle/oradata/orcl/pdbseed/system01.dbf

skipping datafile 7; already restored to file /home/oracle/app/oracle/oradata/orcl/pdbseed/sysaux01.dbf

channel ORA\_DISK\_1: starting datafile backup set restore

channel ORA\_DISK\_1: specifying datafile(s) to restore from backup set

channel ORA\_DISK\_1: restoring datafile 00008 to /home/oracle/app/oracle/oradata/orcl/cars/system01.dbf

channel ORA\_DISK\_1: restoring datafile 00009 to /home/oracle/app/oracle/oradata/orcl/cars/sysaux01.dbf

channel ORA\_DISK\_1: restoring datafile 00010 to /home/oracle/app/oracle/oradata/orcl/cars/SAMPLE\_SCHEMA\_users01.dbf

channel ORA\_DISK\_1: restoring datafile 00011 to /home/oracle/app/oracle/oradata/orcl/cars/example01.dbf

channel ORA\_DISK\_1: restoring datafile 00012 to /home/oracle/app/oracle/oradata/orcl/cars/space01\_1.dbf

channel ORA\_DISK\_1: restoring datafile 00013 to /home/oracle/app/oracle/oradata/orcl/cars/space01\_2.dbf

channel ORA\_DISK\_1: restoring datafile 00016 to /home/oracle/app/oracle/oradata/orcl/cars/space01\_3.dbf

channel ORA\_DISK\_1: restoring datafile 00017 to /home/oracle/app/oracle/oradata/orcl/cars/space01\_4.dbf

channel ORA\_DISK\_1: restoring datafile 00077 to /home/oracle/app/oracle/oradata/orcl/cars/space02\_1.dbf

channel ORA\_DISK\_1: restoring datafile 00078 to /home/oracle/app/oracle/oradata/orcl/cars/space02\_2.dbf

channel ORA\_DISK\_1: reading from backup piece /home/oracle/rman\_backup/dblv0\_ORCL\_20210610\_d7uhb2ap\_1\_1.bak

channel ORA\_DISK\_1: piece handle=/home/oracle/rman\_backup/dblv0\_ORCL\_20210610\_d7uhb2ap\_1\_1.bak tag=TAG20210610T083953

channel ORA\_DISK\_1: restored backup piece 1

channel ORA\_DISK\_1: restore complete, elapsed time: 00:01:41

channel ORA\_DISK\_1: starting datafile backup set restore

channel ORA\_DISK\_1: specifying datafile(s) to restore from backup set

channel ORA\_DISK\_1: restoring datafile 00001 to /home/oracle/app/oracle/oradata/orcl/system01.dbf

channel ORA\_DISK\_1: restoring datafile 00003 to /home/oracle/app/oracle/oradata/orcl/sysaux01.dbf

channel ORA\_DISK\_1: restoring datafile 00004 to /home/oracle/app/oracle/oradata/orcl/undotbs01.dbf

channel ORA\_DISK\_1: restoring datafile 00006 to /home/oracle/app/oracle/oradata/orcl/users01.dbf

channel ORA\_DISK\_1: reading from backup piece /home/oracle/rman\_backup/dblv0\_ORCL\_20210610\_d8uhb2c6\_1\_1.bak

channel ORA\_DISK\_1: piece handle=/home/oracle/rman\_backup/dblv0\_ORCL\_20210610\_d8uhb2c6\_1\_1.bak tag=TAG20210610T083953

channel ORA\_DISK\_1: restored backup piece 1

channel ORA\_DISK\_1: restore complete, elapsed time: 00:01:55

Finished restore at 21-06月-10

RMAN> recover database;

RMAN> alter database open;

Statement processed

RMAN> exit

8.5查询数据是否恢复

[oracle@oracle-pc ~]$ sqlplus study/123@pdborcl

SQL> select \* from t1;

ID NAME

---------- --------------------------------------------------

1 zhang

2 wang

SQL>

由以上查询结果可见，数据100%恢复了!

8.6删除备份集

[oracle@oracle-pc ~]$ rman target /

RMAN> delete backup;

using target database control file instead of recovery catalog

allocated channel: ORA\_DISK\_1

channel ORA\_DISK\_1: SID=366 device type=DISK

List of Backup PiecesBP Key BS Key Pc# Cp# Status Device Type Piece Name

------- ------- --- --- ----------- ----------- ----------275 275 1 1 AVAILABLE DISK /home/oracle/rman\_backup/dblv0\_ORCL\_20210610\_d7uhb2ap\_1\_1.bak276 276 1 1 AVAILABLE DISK /home/oracle/rman\_backup/dblv0\_ORCL\_20210610\_d8uhb2c6\_1\_1.bak277 277 1 1 AVAILABLE DISK /home/oracle/rman\_backup/dblv0\_ORCL\_20210610\_d9uhb2ei\_1\_1.bak278 278 1 1 AVAILABLE DISK /home/oracle/rman\_backup/arclv0\_ORCL\_20210610\_dauhb2fm\_1\_1.bak279 279 1 1 AVAILABLE DISK /home/oracle/rman\_backup/c-1392946895-20210610-01

Do you really want to delete the above objects (enter YES or NO)? yes

deleted backup piece

backup piece handle=/home/oracle/rman\_backup/dblv0\_ORCL\_20210610\_d7uhb2ap\_1\_1.bak RECID=275 STAMP=1024821593

deleted backup piece

backup piece handle=/home/oracle/rman\_backup/dblv0\_ORCL\_20210610\_d8uhb2c6\_1\_1.bak RECID=276 STAMP=1024821638

deleted backup piece

backup piece handle=/home/oracle/rman\_backup/dblv0\_ORCL\_20210610\_d9uhb2ei\_1\_1.bak RECID=277 STAMP=1024821715

deleted backup piece

backup piece handle=/home/oracle/rman\_backup/arclv0\_ORCL\_20210610\_dauhb2fm\_1\_1.bak RECID=278 STAMP=1024821750

deleted backup piece

backup piece handle=/home/oracle/rman\_backup/c-1392946895-20210610-01 RECID=279 STAMP=1024821752Deleted 5 objectsRMAN> exit

[oracle@oracle-pc ~]$ cd rman\_backup

[oracle@oracle-pc rman\_backup]$ ls

lv0\_20210610-083949\_L0.log

由此可知，删除备份集之后，备份文件也删除了。只留下了日志文件。