

Project Part 1

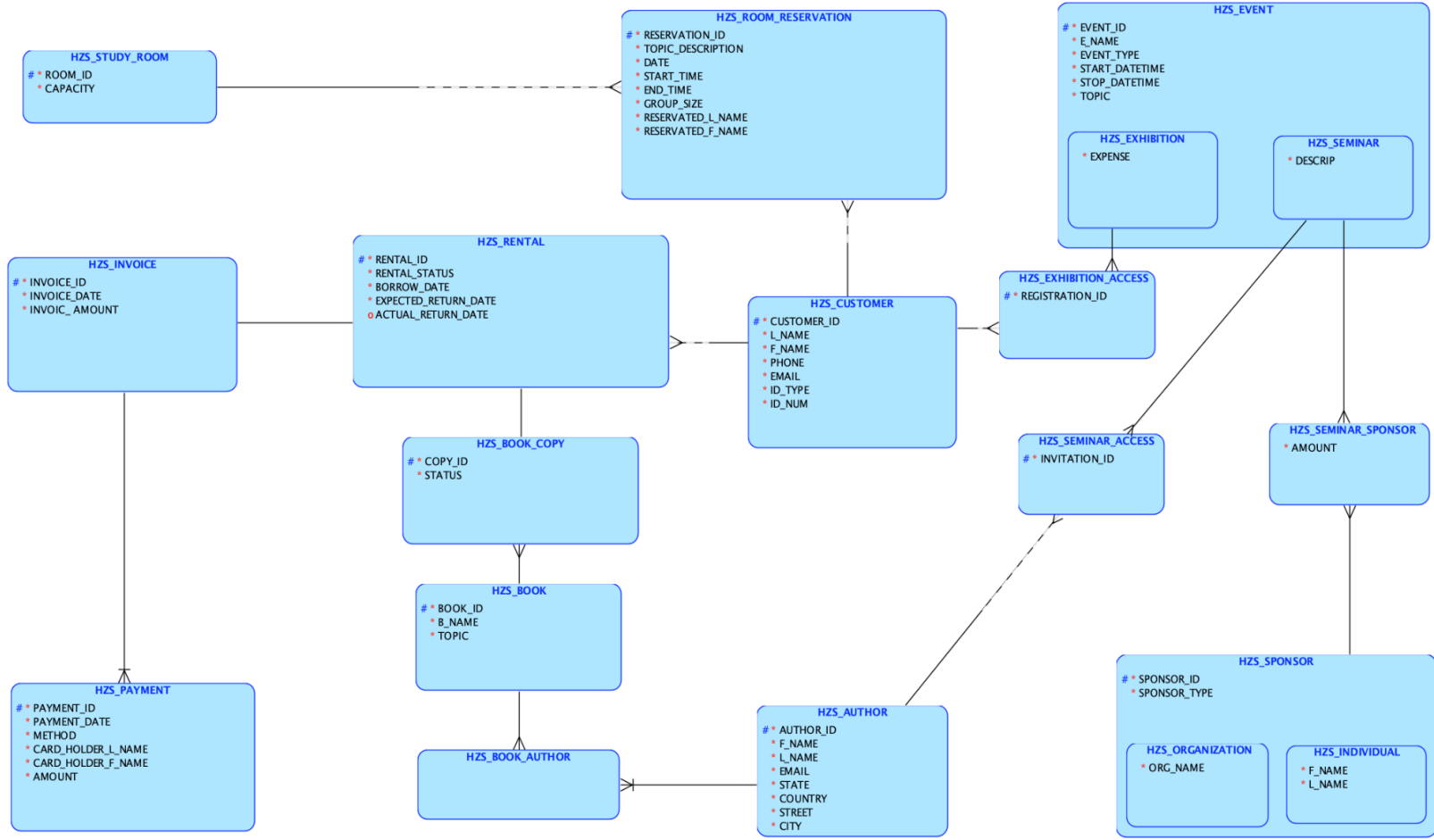
CS-GY 6083 - B, Spring 2025
Principles of Database Systems

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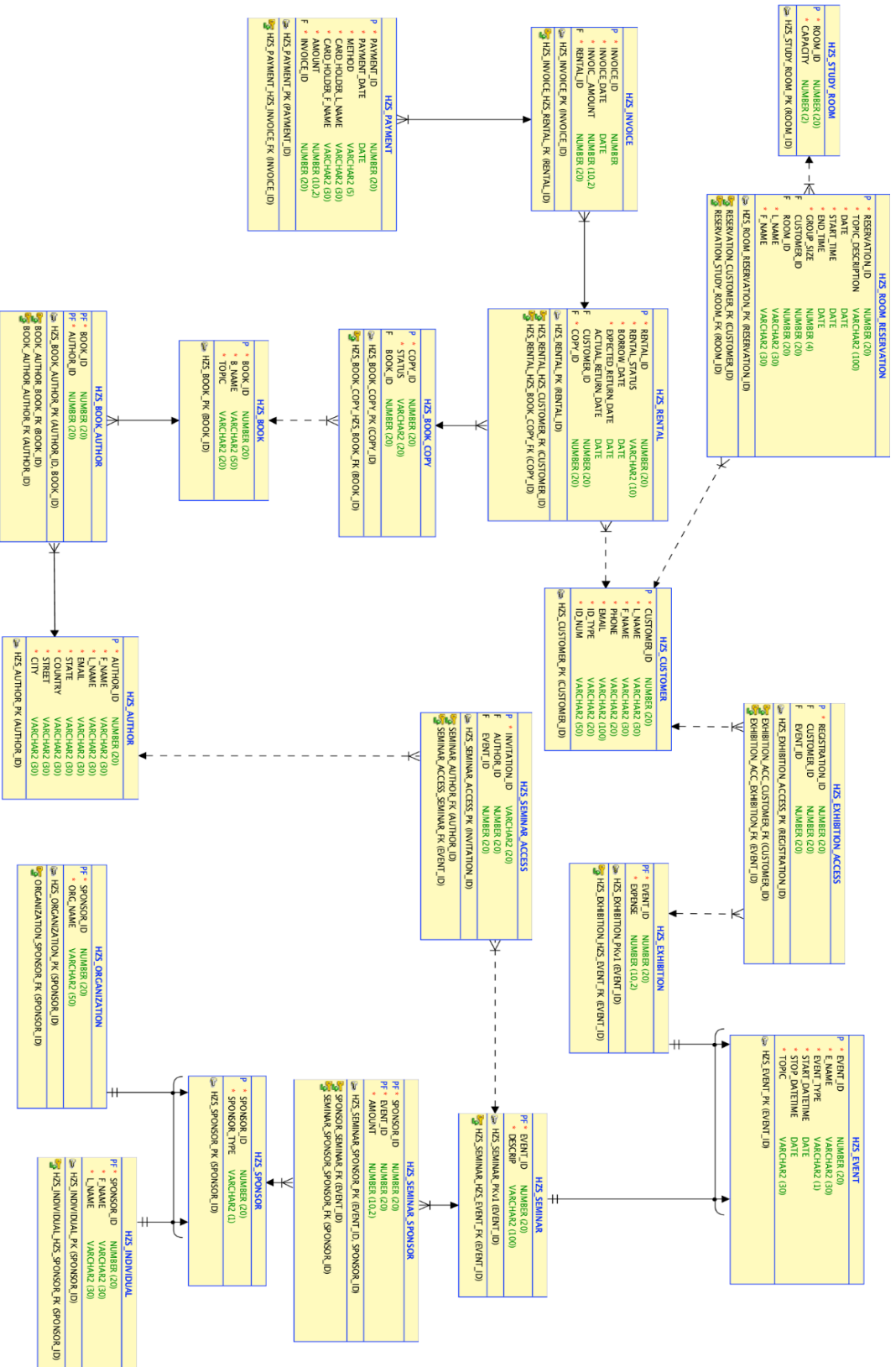
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a) Logical model



Relational model

a)

a) Assumptions

1. Customer

- Each customer maintains only one primary identification, and the value of ID_TYPE allows only {Passport, SSN, DriverLicense}.
- It is assumed that a customer maintains only one phone number (PHONE) and one e-mail address (EMAIL) .

2. Author

- **Only authors** can participate in Seminars (this is accomplished by recording the INVITATION_ID in HZS_SEMINAR_ACCESS) .
- It is assumed that the INVITATION_ID is different for each Seminar, so it is stored in the bridge table (HZS_SEMINAR_ACCESS) rather than in the Author table.

3. Sponsor

- Each Sponsor can only be either "Individual" or "Organization" and is distinguished by SPONSOR_TYPE in the parent table HZS_SPONSOR and then by the and then use the sub-table to store the different types of information.
- Assume that the same Sponsor can sponsor multiple Seminars; at the same time, a Seminar can also have multiple Sponsors.
- The sponsorship amount (AMOUNT) is stored in the many-to-many intermediate table HZS_SEMINAR_SPONSOR.

4. Event (parent table)

- Only {Seminar, Exhibition} are allowed for EventType.
- By means of class table inheritance, HZS_SEMINAR and HZS_EXHIBITION hold subclass proprietary fields (e.g., EXPENSE), respectively.
- If the EventType is Seminar, it must have a corresponding record in HZS_SEMINAR; if it is Exhibition, it must have a corresponding record in HZS_EXHIBITION.

5. Topic

- For simplicity, it is assumed that an Event or Book has only one main Topic.

6. Book / BookCopy

- Book holds only the general information of the book (name, subject, etc.);
- The BookCopy table is used to distinguish between different physical copies, each with a STATUS.
- When all copies have been borrowed, they are unavailable and the customer has to wait.

7. Rental (Borrowed Books)

- Each rental corresponds to one HZS_RENTAL record; a rental contains only "one copy". If the user borrows more than one book at a time, there will be more than one record in RENTAL.
- ACTUAL_RETURN_DATE If not filled in, it means it has not been returned; it is used to calculate the invoice after it is returned.
- RENTAL_STATUS can be {Borrowed, Returned, Late}, etc. **Late** can also be updated automatically based on date logic.

- The question specifies the cost calculation: 0.2\$/day, overdue 0.4\$/day, and the trigger automatically completes this part of the logic.

8. Invoice

- An Invoice is generated for each Rental that is returned. It is assumed that one Rental corresponds to at most one Invoice.
- INVOICE_AMOUNT >= 0 is limited by the CHECK constraint.

9. Payment

- The same Invoice can be paid multiple times, so HZS_PAYMENT and HZS_INVOICE have a 1-to-many relationship.
- METHOD Only {CASH, CREDIT, DEBIT, PAYPAL} is allowed.
- Fields such as CARD_HOLDER_NAME can be recorded if paying with a credit/debit card, but can be left empty if paying with cash.

10. StudyRoom / RoomReservation

- The topic describes the need to record only **one customer** (not all group members) and store his/her customer ID in the reservation table.
- GROUP_SIZE is for reference only, no more detailed information is stored for each member.
- Prevent duplicate bookings for the same time period by START_TIME & END_TIME, with conflict checking done by the application layer or database triggers.

b) CHECK constraints:

```
ALTER TABLE HZS_CUSTOMER
```

```
ADD CONSTRAINT CK_CUSTOMER_ID_TYPE
```

```
CHECK (ID_TYPE IN ('Passport', 'SSN', 'Driver_License'));
```

```
ALTER TABLE HZS_SPONSOR
```

```
ADD CONSTRAINT CK_SPONSOR_TYPE
```

```
CHECK (SPONSOR_TYPE IN ('INDIVIDUAL', 'ORGANIZATION'));
```

```
ALTER TABLE HZS_RENTAL
```

```
ADD CONSTRAINT CK_RENTAL_DATES
```

```
CHECK (
```

```
    ACTUAL_RETURN_DATE IS NULL
```

```
    OR ACTUAL_RETURN_DATE >= BORROW_DATE
```

```
);
```

```
ALTER TABLE HZS_PAYMENT  
ADD CONSTRAINT CK_PAYMENT_METHOD  
CHECK (METHOD IN ('CASH', 'CREDIT', 'DEBIT', 'PAYPAL'));
```

```
ALTER TABLE HZS_INVOICE  
ADD CONSTRAINT CK_INVOICE_AMOUNT  
CHECK (INVOIC__AMOUNT >= 0);
```

```
ALTER TABLE HZS_EXHIBITION  
ADD CONSTRAINT CK_EXHIBITION_EXPENSE  
CHECK (EXPENSE >= 0);
```

```
ALTER TABLE HZS_BOOK_COPY  
ADD CONSTRAINT C_STATUS_TYPE  
CHECK (STATUS IN ('AVAILABLE', 'UNAVAILABLE'));
```

```
ALTER TABLE HZS_RENTAL  
ADD CONSTRAINT C_RENTAL_STATUS  
CHECK (RENTAL_STATUS IN ('BORROWED', 'RETURNED', 'LATE'));
```

```
ALTER TABLE HZS_SEMINAR_SPONSOR  
ADD CONSTRAINT C_SPONSORED_AMOUNT  
CHECK (AMOUNT >= 0);
```

```
ALTER TABLE HZS_STUDY_ROOM  
ADD CONSTRAINT C_POSITIVE_CAPACITY  
CHECK (CAPACITY > 0);
```

c) Trigger:

```
CREATE SEQUENCE seq_invoice_id START WITH 1 INCREMENT BY 1;
```

```
CREATE OR REPLACE TRIGGER trg_generate_invoice
AFTER UPDATE OF ACTUAL_RETURN_DATE ON HZS_RENTAL
FOR EACH ROW
WHEN (NEW.ACTUAL_RETURN_DATE IS NOT NULL AND
      (OLD.ACTUAL_RETURN_DATE IS NULL OR OLD.ACTUAL_RETURN_DATE <>
NEW.ACTUAL_RETURN_DATE))
DECLARE
  v_days_borrowed NUMBER;
  v_days_late     NUMBER;
  v_invoice_amount NUMBER;
BEGIN
  IF :NEW.ACTUAL_RETURN_DATE <= :NEW.EXPECTED_RETURN_DATE THEN
    v_days_borrowed := :NEW.ACTUAL_RETURN_DATE - :NEW.BORROW_DATE;
    v_invoice_amount := v_days_borrowed * 0.2;
  ELSE
    v_days_borrowed := :NEW.EXPECTED_RETURN_DATE - :NEW.BORROW_DATE;
    v_days_late := :NEW.ACTUAL_RETURN_DATE - :NEW.EXPECTED_RETURN_DATE;
    v_invoice_amount := (v_days_borrowed * 0.2) + (v_days_late * 0.4);
  END IF;
  INSERT INTO HZS_INVOICE (INVOICE_ID, RENTAL_ID, INVOICE_DATE,
INVOIC__AMOUNT)
VALUES (seq_invoice_id.NEXTVAL, :NEW.RENTAL_ID, SYSDATE, v_invoice_amount);
```

END;

d) Count(*) Query Results

Count(*) query and result for each table:

```
SELECT COUNT(*) AS TOTAL_CUSTOMERS FROM HZS_CUSTOMER
```

TOTAL_CUSTOMERS
10

Download CSV

```
SELECT COUNT(*) AS TOTAL_EVENTS FROM HZS_EVENT
```

TOTAL_EVENTS
20

Download CSV

```
SELECT COUNT(*) AS TOTAL_AUTHORS FROM HZS_AUTHOR
```

TOTAL_AUTHORS
10

```
SELECT COUNT(*) AS TOTAL_BOOKS FROM HZS_BOOK
```

TOTAL_BOOKS
10

Download CSV

```
SELECT COUNT(*) AS TOTAL_BOOK_AUTHOR_LINKS FROM HZS_BOOK_AUTHOR
```

TOTAL_BOOK_AUTHOR_LINKS
15

Download CSV

```
SELECT COUNT(*) AS TOTAL_INVOICES FROM HZS_INVOICE
```

```
SELECT COUNT(*) AS TOTAL_EXHIBITIONS FROM HZS_EXHIBITION
```

TOTAL_EXHIBITIONS
10

Download CSV

```
SELECT COUNT(*) AS TOTAL_SEMINARS FROM HZS_SEMINAR
```

TOTAL_SEMINARS
10

Download CSV

```
SELECT COUNT(*) AS TOTAL_EXHIBITION_ACCESS FROM HZS_EXHIBITION_ACCESS
```

TOTAL_EXHIBITION_ACCESS
10

```
SELECT COUNT(*) AS TOTAL_PAYMENTS FROM HZS_PAYMENT
```

TOTAL_PAYMENTS
10

Download CSV

```
SELECT COUNT(*) AS TOTAL_SPONSORS FROM HZS_SPONSOR
```

TOTAL_SPONSORS
20

Download CSV

SELECT COUNT(*) AS TOTAL_BOOK_COPIES FROM HZS_BOOK_COPY

TOTAL_BOOK_COPIES
10

Download CSV

SELECT COUNT(*) AS TOTAL_STUDY_ROOMS FROM HZS_STUDY_ROOM

TOTAL_STUDY_ROOMS
10

Download CSV

SELECT COUNT(*) AS TOTAL_RENTALS FROM HZS_RENTAL

TOTAL_RENTALS
10

SELECT COUNT(*) AS TOTAL_INDIVIDUAL_SPONSORS FROM HZS_INDIVIDUAL

TOTAL_INDIVIDUAL_SPONSORS
10

Download CSV

SELECT COUNT(*) AS TOTAL_ROOM_RESERVATIONS FROM HZS_ROOM_RESERVATION

TOTAL_ROOM_RESERVATIONS
10

Download CSV

SELECT COUNT(*) AS TOTAL_ORGANIZATIONAL_SPONSORS FROM HZS_ORGANIZATION

TOTAL_ORGANIZATIONAL_SPONSORS
10

Download CSV

SELECT COUNT(*) AS TOTAL_SEMINAR_SPONSORS FROM HZS_SEMINAR_SPONSOR

TOTAL_SEMINAR_SPONSORS
10

e)Data Dictionary

TABLE NAME	COLUMN NAME	DATA TYPE	DATA_LENGTH	DATA_PRECISION	DATA_SCALE	IS_NULLABLE	COLUMN COMMENT	TABLE COMMENT	CONSTRAINT NAME	CONSTRAINT_TYPE	CONSTRAINT_STATUS	RN
HZS_AUTHOR	AUTHOR_ID	NUMBER	22		20	0 N	This is the unique ID of the author.	-	HZS_AUTHOR_PK	P	ENABLED	1
HZS_AUTHOR	AUTHOR_ID	NUMBER	22		20	0 N	This is the unique ID of the author.	-	SYS_C00185098942	C	ENABLED	2
HZS_AUTHOR	F_NAME	VARCHAR2	30	-	-	N	First name of the author.	-	SYS_C00185098943	C	ENABLED	3
HZS_AUTHOR	L_NAME	VARCHAR2	30	-	-	N	Last name of the author.	-	SYS_C00185098944	C	ENABLED	4
HZS_AUTHOR	EMAIL	VARCHAR2	30	-	-	N	Contact email of the author.	-	SYS_C00185098945	C	ENABLED	5
HZS_AUTHOR	STATE	VARCHAR2	30	-	-	N	State of residence of the author.	-	SYS_C00185098946	C	ENABLED	6
HZS_AUTHOR	COUNTRY	VARCHAR2	30	-	-	N	Country of residence of the author.	-	SYS_C00185098947	C	ENABLED	7
HZS_AUTHOR	STREET	VARCHAR2	30	-	-	N	Street address of the author.	-	SYS_C00185098948	C	ENABLED	8
HZS_AUTHOR	CTY	VARCHAR2	30	-	-	N	City of residence of the author.	-	SYS_C00185098949	C	ENABLED	9
HZS_BOOK	BOOK_ID	NUMBER	22		20	0 N	This is the unique ID of the book.	-	HZS_BOOK_PK	P	ENABLED	10
HZS_BOOK	BOOK_ID	NUMBER	22		20	0 N	This is the unique ID of the book.	-	SYS_C00185098951	C	ENABLED	11
HZS_BOOK	B_NAME	VARCHAR2	50	-	-	N	The name of the book.	-	SYS_C00185098952	C	ENABLED	12
HZS_BOOK	TOPIC	VARCHAR2	20	-	-	N	The topic category of the book.	-	SYS_C00185098953	C	ENABLED	13
HZS_BOOK_AUTHOR	BOOK_ID	NUMBER	22		20	0 N	This is the unique ID of the book.	-	BOOK_AUTHOR_BOOK_FK	R	ENABLED	14
HZS_BOOK_AUTHOR	BOOK_ID	NUMBER	22		20	0 N	This is the unique ID of the book.	-	HZS_BOOK_AUTHOR_PK	P	ENABLED	15
HZS_BOOK_AUTHOR	BOOK_ID	NUMBER	22		20	0 N	This is the unique ID of the book.	-	SYS_C00185098955	C	ENABLED	16
HZS_BOOK_AUTHOR	AUTHOR_ID	NUMBER	22		20	0 N	This is the unique ID of the author.	-	BOOK_AUTHOR_AUTHOR_FK	R	ENABLED	17
HZS_BOOK_AUTHOR	AUTHOR_ID	NUMBER	22		20	0 N	This is the unique ID of the author.	-	HZS_BOOK_AUTHOR_PK	P	ENABLED	18
HZS_BOOK_AUTHOR	AUTHOR_ID	NUMBER	22		20	0 N	This is the unique ID of the author.	-	SYS_C00185098956	C	ENABLED	19
HZS_BOOK_COPY	COPY_ID	NUMBER	22		20	0 N	This is the unique ID of each book copy.	-	HZS_BOOK_COPY_PK	P	ENABLED	20
HZS_BOOK_COPY	COPY_ID	NUMBER	22		20	0 N	This is the unique ID of each book copy.	-	SYS_C00185098958	C	ENABLED	21
HZS_BOOK_COPY	STATUS	VARCHAR2	20	-	-	N	Indicates whether the book copy is available or not.	-	C_STATUS_TYPE	C	ENABLED	22
HZS_BOOK_COPY	STATUS	VARCHAR2	20	-	-	N	Indicates whether the book copy is available or not.	-	SYS_C00185098959	C	ENABLED	23
HZS_BOOK_COPY	BOOK_ID	NUMBER	22		20	0 Y	This is the unique ID of the book.	-	HZS_BOOK_COPY_HZS_BOOK_FK	R	ENABLED	24
HZS_CUSTOMER	CUSTOMER_ID	NUMBER	22		20	0 N	This is the unique ID of the customer.	-	HZS_CUSTOMER_PK	P	ENABLED	25
HZS_CUSTOMER	CUSTOMER_ID	NUMBER	22		20	0 N	This is the unique ID of the customer.	-	SYS_C00185098961	C	ENABLED	26
HZS_CUSTOMER	L_NAME	VARCHAR2	30	-	-	N	Last name of the customer.	-	SYS_C00185098962	C	ENABLED	27
HZS_CUSTOMER	F_NAME	VARCHAR2	30	-	-	N	First name of the customer.	-	SYS_C00185098963	C	ENABLED	28
HZS_CUSTOMER	PHONE	VARCHAR2	30	-	-	N	Customer contact number.	-	SYS_C00185098964	C	ENABLED	29
HZS_CUSTOMER	EMAIL	VARCHAR2	100	-	-	N	Customer email address.	-	SYS_C00185098965	C	ENABLED	30
HZS_CUSTOMER	ID_TYPE	VARCHAR2	20	-	-	N	Type of identification (Passport, SSN, or Driver License).	-	CK_CUSTOMER_ID_TYPE	C	ENABLED	31
HZS_CUSTOMER	ID_TYPE	VARCHAR2	20	-	-	N	Type of identification (Passport, SSN, or Driver License).	-	SYS_C00185098966	C	ENABLED	32
HZS_CUSTOMER	ID_NUM	VARCHAR2	1	-	-	N	The specific number for the ID	-	SYS_C00185098967	C	ENABLED	33
HZS_EVENT	EVENT_ID	NUMBER	22		20	0 N	-	-	HZS_EVENT_PK	P	ENABLED	34
HZS_EVENT	EVENT_ID	NUMBER	22		20	0 N	-	-	SYS_C00185098969	C	ENABLED	35
HZS_EVENT	E_NAME	VARCHAR2	30	-	-	N	-	-	SYS_C00185098970	C	ENABLED	36
HZS_EVENT	EVENT_TYPE	VARCHAR2	1	-	-	N	Seminar or Exhibition	-	CH_INH_HZS_EVENT	C	ENABLED	37
HZS_EVENT	EVENT_TYPE	VARCHAR2	1	-	-	N	Seminar or Exhibition	-	SYS_C00185098971	C	ENABLED	38
HZS_EVENT	START_DATETIME	DATE	7	-	-	N	-	-	SYS_C00185098972	C	ENABLED	39
HZS_EVENT	STOP_DATETIME	DATE	7	-	-	N	-	-	SYS_C00185098973	C	ENABLED	40
HZS_EVENT	TOPIC	VARCHAR2	30	-	-	N	-	-	SYS_C00185098974	C	ENABLED	41
HZS_EXHIBITION	EVENT_ID	NUMBER	22		20	0 N	-	-	SYS_EXHIBITION_HZS_EVENT_FK	R	ENABLED	42
HZS_EXHIBITION	EVENT_ID	NUMBER	22		20	0 N	-	-	HZS_EXHIBITION_PKV1	P	ENABLED	43
HZS_EXHIBITION	EVENT_ID	NUMBER	22		20	0 N	-	-	SYS_C00185098977	C	ENABLED	44
HZS_EXHIBITION	EXPENSE	NUMBER	22		10	2 N	Expense of an exhibition.	-	CK_EXHIBITION_EXPENSE	C	ENABLED	45
HZS_EXHIBITION	EXPENSE	NUMBER	22		10	2 N	Expense of an exhibition.	-	SYS_C00185098978	C	ENABLED	46
HZS_EXHIBITION_ACCESS	REGISTRATION_ID	NUMBER	22		20	0 N	This is the unique ID of the access.	-	HZS_EXHIBITION_ACCESS_PK	P	ENABLED	47
HZS_EXHIBITION_ACCESS	REGISTRATION_ID	NUMBER	22		20	0 N	This is the unique ID of the access.	-	SYS_C00185098980	C	ENABLED	48
HZS_EXHIBITION_ACCESS	CUSTOMER_ID	NUMBER	22		20	0 Y	This is the unique ID of the customer.	-	EXHIBITION_ACC_CUSTOMER_FK	R	ENABLED	49
HZS_EXHIBITION_ACCESS	EVENT_ID	NUMBER	22		20	0 Y	-	-	EXHIBITION_ACC_EXHIBITION_FK	R	ENABLED	50
HZS_INDIVIDUAL	SPONSOR_ID	NUMBER	22		20	0 N	This is the unique ID of the sponsor.	-	HZS_INDIVIDUAL_HZS_SPONSOR_FK	R	ENABLED	51
HZS_INDIVIDUAL	SPONSOR_ID	NUMBER	22		20	0 N	This is the unique ID of the sponsor.	-	HZS_INDIVIDUAL_PK	P	ENABLED	52
HZS_INDIVIDUAL	SPONSOR_ID	NUMBER	22		20	0 N	This is the unique ID of the sponsor.	-	SYS_C00185098982	C	ENABLED	53
HZS_INDIVIDUAL	F_NAME	VARCHAR2	30	-	-	N	First name of the individual sponsor.	-	SYS_C00185098983	C	ENABLED	54
HZS_INDIVIDUAL	L_NAME	VARCHAR2	30	-	-	N	Last name of the individual sponsor.	-	SYS_C00185098984	C	ENABLED	55
HZS_INVOICE	INVOICE_ID	NUMBER	22		-	N	This is the unique ID of the invoice.	-	HZS_INVOICE_PK	P	ENABLED	56
HZS_INVOICE	INVOICE_ID	NUMBER	22		-	N	This is the unique ID of the invoice.	-	SYS_C00185098986	C	ENABLED	57
HZS_INVOICE	INVOICE_DATE	DATE	7	-	-	N	The date when the invoice was issued.	-	SYS_C00185098987	C	ENABLED	58
HZS_INVOICE	INVOICE_AMOUNT	NUMBER	22		10	2 N	The total amount to be paid for the rental.	-	CK_INVOICE_AMOUNT	C	ENABLED	59
HZS_INVOICE	INVOICE_AMOUNT	NUMBER	22		10	2 N	The total amount to be paid for the rental.	-	SYS_C00185098988	C	ENABLED	60
HZS_INVOICE	RENTAL_ID	NUMBER	22		20	0 N	-	-	HZS_INVOICE_HZS_RENTAL_FK	R	ENABLED	61
HZS_INVOICE	RENTAL_ID	NUMBER	22		20	0 N	-	-	SYS_C00185098989	C	ENABLED	62
HZS_ORGANIZATION	SPONSOR_ID	NUMBER	22		20	0 N	This is the unique ID of the sponsor.	-	HZS_ORGANIZATION_PK	P	ENABLED	63
HZS_ORGANIZATION	SPONSOR_ID	NUMBER	22		20	0 N	This is the unique ID of the sponsor.	-	ORGANIZATION_SPONSOR_FK	R	ENABLED	64
HZS_ORGANIZATION	SPONSOR_ID	NUMBER	22		20	0 N	This is the unique ID of the sponsor.	-	SYS_C00185098991	C	ENABLED	65
HZS_ORGANIZATION	ORG_NAME	VARCHAR2	50	-	-	N	The name of the sponsoring organization.	-	SYS_C00185098992	C	ENABLED	66
HZS_PAYMENT	PAYMENT_ID	NUMBER	22		20	0 N	This is the unique ID of the payment transaction.	-	HZS_PAYMENT_PK	P	ENABLED	67
HZS_PAYMENT	PAYMENT_ID	NUMBER	22		20	0 N	This is the unique ID of the payment transaction.	-	SYS_C00185098994	C	ENABLED	68
HZS_PAYMENT	PAYMENT_DATE	DATE	7	-	-	N	The date when the payment was made.	-	SYS_C00185098995	C	ENABLED	69
HZS_PAYMENT	METHOD	VARCHAR2	5	-	-	N	Payment method used (Cash, Credit, Debit, PayPal).	-	CK_PAYMENT_METHOD	C	ENABLED	70
HZS_PAYMENT	METHOD	VARCHAR2	5	-	-	N	Payment method used (Cash, Credit, Debit, PayPal).	-	SYS_C00185098996	C	ENABLED	71
HZS_PAYMENT	CARD_HOLDER_L_NAME	VARCHAR2	30	-	-	N	Last name of the cardholder.	-	SYS_C00185098997	C	ENABLED	72
HZS_PAYMENT	CARD_HOLDER_F_NAME	VARCHAR2	30	-	-	N	First name of the cardholder.	-	SYS_C00185098998	C	ENABLED	73
HZS_PAYMENT	AMOUNT	NUMBER	22		10	2 N	The amount paid in the transaction.	-	SYS_C00185098999	C	ENABLED	74
HZS_PAYMENT	INVOICE_ID	NUMBER	22		20	0 N	This is the unique ID of the invoice.	-	HZS_PAYMENT_HZS_INVOICE_FK	R	ENABLED	75
HZS_PAYMENT	INVOICE_ID	NUMBER	22		20	0 N	This is the unique ID of the invoice.	-	SYS_C00185099000	C	ENABLED	76
HZS_RENTAL	RENTAL_ID	NUMBER	22		20	0 N	-	-	HZS_RENTAL_PK	P	ENABLED	77
HZS_RENTAL	RENTAL_ID	NUMBER	22		20	0 N	-	-	SYS_C00185099002	C	ENABLED	78
HZS_RENTAL	RENTAL_STATUS	VARCHAR2	10	-	-	N	-	-	C_RENTAL_STATUS	C	ENABLED	79
HZS_RENTAL	RENTAL_STATUS	VARCHAR2	10	-	-	N	-	-	SYS_C00185099003	C	ENABLED	80
HZS_RENTAL	BORROW_DATE	DATE	7	-	-	N	-	-	CK_RENTAL_DATES	C	ENABLED	81
HZS_RENTAL	BORROW_DATE	DATE	7	-	-	N	-	-	SYS_C00185099004	C	ENABLED	82
HZS_RENTAL	EXPIRED_RETURN_DATE	DATE	7	-	-	N	-	-	SYS_C00185099005	C	ENABLED	83
HZS_RENTAL	ACTUAL_RETURN_DATE	DATE	7	-	-	N	-	-	CK_RENTAL_DATES	C	ENABLED	84
HZS_RENTAL	CUSTOMER_ID	NUMBER	22		20	0 Y	-	-	HZS_RENTAL_HZS_CUSTOMER_FK	R	ENABLED	85
HZS_RENTAL	COPY_ID	NUMBER	22		20	0 N	-	-	HZS_RENTAL_HZS_BOOK_COPY_FK	R	ENABLED	86
HZS_RENTAL	COPY_ID	NUMBER	22		20	0 N	-	-	SYS_C00185099006	C	ENABLED	87
HZS_ROOM_RESERVATION	RESERVATION_ID	NUMBER	22		20	0 N	This is the unique ID of the room reservation.	-	HZS_ROOM_RESERVATION_FK	P	ENABLED	88
HZS_ROOM_RESERVATION	RESERVATION_ID	NUMBER	22		20	0 N	This is the unique ID of the room reservation.	-	SYS_C00185099008	C	ENABLED	89
HZS_ROOM_RESERVATION	TOPIC_DESCRIPTION	VARCHAR2	100	-	-	N	A brief description of the study topic for the reservation.	-	SYS_C00185099009	C	ENABLED	90
HZS_ROOM_RESERVATION	DATE	DATE	7	-	-	N	The date on which the study room is reserved.	-	SYS_C00185099010	C	ENABLED	91
HZS_ROOM_RESERVATION	START_TIME	DATE	7	-	-	N	The start time of the study room reservation.	-	SYS_C00185099011	C	ENABLED	92
HZS_ROOM_RESERVATION	END_TIME	DATE	7	-	-	N	The end time of the study room reservation.	-	SYS_C00185099012	C	ENABLED	93
HZS_ROOM_RESERVATION	GROUP_SIZE	NUMBER	22		4	0 N	The total number of people in the group reservation.	-	SYS_C00185099013	C	ENABLED	94
HZS_ROOM_RESERVATION	CUSTOMER_ID	NUMBER	22		20	0 Y	This is the unique ID of the customer.	-	RESERVATION_CUSTOMER_FK	R	ENABLED	95
HZS_ROOM_RESERVATION	ROOM_ID	NUMBER	22		20	0 Y	This is the unique ID of the room.	-	RESERVATION_STUDY_ROOM_FK	R	ENABLED	96
HZS_ROOM_RESERVATION	L_NAME	VARCHAR2	30	-	-	N	Last name of the person who made the reservation.	-	SYS_C00185099014	C	ENABLED	97
HZS_ROOM_RESERVATION	F_NAME	VARCHAR2	30	-	-	N	First name of the person who made the reservation.	-	SYS_C00185099015	C	ENABLED	98
HZS_SEMINAR	EVENT_ID	NUMBER	22		20	0 N	-	-	HZS_SEMINAR_HZS_EVENT_FK	R	ENABLED	99
HZS_SEMINAR	EVENT_ID	NUMBER	22		20	0 N	-	-	HZS_SEMINAR_PKV1	P	ENABLED	100
HZS_SEMINAR	EVENT_ID	NUMBER	22		20	0 N	-	-	SYS_C00185099017	C	ENABLED	101
HZS_SEMINAR	DESCRIP	VARCHAR2	100	-	-	N	Description of a seminar	-	SYS_C00185099018	C	ENABLED	102
HZS_SEMINAR_ACCESS	INVITATION_ID	VARCHAR2	20	-	-	N	This is the unique ID of the invitation.	-	HZS_SEMINAR_ACCESS_PK	P	ENABLED	103
HZS_SEMINAR_ACCESS	INVITATION_ID	VARCHAR2	20	-	-	N	This is the unique ID of the invitation.	-	SYS_C00185099020	C	ENABLED	104
HZS_SEMINAR_ACCESS	AUTHOR_ID	NUMBER	22		20	0 Y	This is the unique ID of the author.	-	SEMINAR_AUTHOR_FK	R	ENABLED	105
HZS_SEMINAR_ACCESS	EVENT_ID	NUMBER	22		20	0 Y	-	-	SEMINAR_ACCESS_SEMINAR_FK	R	ENABLED	106
HZS_SEMINAR_SPONSOR	SPONSOR_ID	NUMBER	22		20	0 N	-	-	HZS_SEMINAR_SPONSOR_PK	P	ENABLED	107
HZS_SEMINAR_SPONSOR	SPONSOR_ID	NUMBER	22		20	0 N	This is the unique ID of the sponsor.	-	SEMINAR_SPONSOR_SPONSOR_FK	R	ENABLED	108
HZS_SEMINAR_SPONSOR	SPONSOR_ID	NUMBER	22		20	0 N	-	-	SYS_C00185099022	C	ENABLED	109
HZS_SEMINAR_SPONSOR	EVENT_ID	NUMBER	22		20	0 N	-	-	HZS_SEMINAR_SPONSOR_FK	P	ENABLED	110
HZS_SEMINAR_SPONSOR	EVENT_ID	NUMBER	22		20	0 N	-	-	SPONSOR_SEMINAR_FK	R	ENABLED	111
HZS_SEMINAR_SPONSOR	EVENT_ID	NUMBER	22		20	0 N	-	-	SYS_C00185099023	C	ENABLED	112
HZS_SEMINAR_SPONSOR	AMOUNT	NUMBER	22		10	2 N	The amount sponsored for a seminar.	-	C_SPONSORED_AMOUNT	C	ENABLED	113
HZS_SEMINAR_SPONSOR	AMOUNT	NUMBER	22		10	2 N	The amount sponsored for a seminar.	-	SYS_C00185099024	C	ENABLED	114
HZS_SPONSOR	SPONSOR_ID	NUMBER	22		20	0 N	This is the unique ID of the sponsor.	-	HZS_SPONSOR_PK	P	ENABLED	115
HZS_SPONSOR	SPONSOR_ID	NUMBER	22		20	0 N	This is the unique ID of the sponsor.	-	SYS_C00185099026	C	ENABLED	116
HZS_SPONSOR	SPONSOR_TYPE	VARCHAR2	1	-	-	N	The type of sponsor (Individual or Organization).	-	CH_INH_HZS_SPONSOR	C	ENABLED	117
HZS_SPONSOR	SPONSOR_TYPE	VARCHAR2	1	-	-	N	The type of sponsor (Individual or Organization).	-	CK_SPONSOR_TYPE	C	ENABLED	118
HZS_SPONSOR	SPONSOR_TYPE	VARCHAR2	1	-	-	N	The type of sponsor (Individual or Organization).	-	SYS_C00185099027	C	ENABLED	119
HZS_STUDY_ROOM	ROOM_ID	NUMBER	22		20	0 N	This is the unique ID of the room.	-	HZS_STUDY_ROOM_PK	P	ENABLED	120

f) DDL Code

```

SELECT
    utc.table_name,
    utc.column_name,
    utc.data_type,
    utc.data_length,
    utc.data_precision,
    utc.data_scale,
    utc.nullable          AS is_nullable,
    ucc.comments          AS column_comment,
    utcom.comments        AS table_comment,
    uc.constraint_name,
    uc.constraint_type,
    uc.status             AS constraint_status
FROM user_tab_cols utc
LEFT JOIN user_col_comments ucc
    ON utc.table_name = ucc.table_name AND utc.column_name = ucc.column_name
LEFT JOIN user_tab_comments utcom
    ON utc.table_name = utcom.table_name
LEFT JOIN user_cons_columns ucc2
    ON utc.table_name = ucc2.table_name AND utc.column_name = ucc2.column_name
LEFT JOIN user_constraints uc
    ON ucc2.constraint_name = uc.constraint_name AND ucc2.table_name = uc.table_name
ORDER BY utc.table_name, utc.column_id;

```

DDL code:

```

-- Generated by Oracle SQL Developer Data Modeler 24.3.1.351.0831
-- Time: 2025-03-30 21:05:36 EDT
-- Site: Oracle Database 12c
-- Type: Oracle Database 12c

```

```

-- predefined type, no DDL - MDSYS.SDO_GEOMETRY

```

```

-- predefined type, no DDL - XMLTYPE

```

```
CREATE TABLE HZS_AUTHOR
```

```
(
  AUTHOR_ID NUMBER (20) NOT NULL ,
  F_NAME  VARCHAR2 (30) NOT NULL ,
  L_NAME  VARCHAR2 (30) NOT NULL ,
  EMAIL   VARCHAR2 (30) NOT NULL ,
  STATE   VARCHAR2 (30) NOT NULL ,
  COUNTRY VARCHAR2 (30) NOT NULL ,
  STREET  VARCHAR2 (30) NOT NULL ,
  CITY    VARCHAR2 (30) NOT NULL
)
```

```
;
```

```
COMMENT ON COLUMN HZS_AUTHOR.AUTHOR_ID IS 'This is the unique ID of the author.'
```

```
;
```

```
COMMENT ON COLUMN HZS_AUTHOR.F_NAME IS 'First name of the author.'
```

```
;
```

```
COMMENT ON COLUMN HZS_AUTHOR.L_NAME IS 'Last name of the author.'
```

```
;
```

```
COMMENT ON COLUMN HZS_AUTHOR.EMAIL IS 'Contact email of the author.'
```

```
;
```

```
COMMENT ON COLUMN HZS_AUTHOR.STATE IS 'State of residence of the author.'
```

```
;
```

```
COMMENT ON COLUMN HZS_AUTHOR.COUNTRY IS 'Country of residence of the author.'
```

```
;
```

```
COMMENT ON COLUMN HZS_AUTHOR.STREET IS 'Street address of the author.'
```

```
;
```

```
COMMENT ON COLUMN HZS_AUTHOR.CITY IS 'City of residence of the author.'
```

```
;
```

```
ALTER TABLE HZS_AUTHOR
```

```
  ADD CONSTRAINT HZS_AUTHOR_PK PRIMARY KEY ( AUTHOR_ID );
```

```
CREATE TABLE HZS_BOOK
```

```
(
  BOOK_ID NUMBER (20) NOT NULL ,
  B_NAME  VARCHAR2 (50) NOT NULL ,
```

```

    TOPIC VARCHAR2 (20) NOT NULL
  )
;

COMMENT ON COLUMN HZS_BOOK.BOOK_ID IS 'This is the unique ID of the book.'
;

COMMENT ON COLUMN HZS_BOOK.B_NAME IS 'The name of the book.'
;

COMMENT ON COLUMN HZS_BOOK.TOPIC IS 'The topic category of the book.'
;

ALTER TABLE HZS_BOOK
  ADD CONSTRAINT HZS_BOOK_PK PRIMARY KEY ( BOOK_ID );

CREATE TABLE HZS_BOOK_AUTHOR
(
  BOOK_ID  NUMBER (20) NOT NULL ,
  AUTHOR_ID NUMBER (20) NOT NULL
)
;

COMMENT ON COLUMN HZS_BOOK_AUTHOR.BOOK_ID IS 'This is the unique ID of the
book.'
;

COMMENT ON COLUMN HZS_BOOK_AUTHOR.AUTHOR_ID IS 'This is the unique ID of the
author.'
;

ALTER TABLE HZS_BOOK_AUTHOR
  ADD CONSTRAINT HZS_BOOK_AUTHOR_PK PRIMARY KEY ( AUTHOR_ID, BOOK_ID );

CREATE TABLE HZS_BOOK_COPY
(
  COPY_ID NUMBER (20) NOT NULL ,
  STATUS VARCHAR2 (20) NOT NULL ,
  BOOK_ID NUMBER (20)
)
;

COMMENT ON COLUMN HZS_BOOK_COPY.COPY_ID IS 'This is the unique ID of each book
copy.'
```

```
;
```

```
COMMENT ON COLUMN HZS_BOOK_COPY.STATUS IS 'Indicates whether the book copy is
available or not.'
```

```
;
```

```
COMMENT ON COLUMN HZS_BOOK_COPY.BOOK_ID IS 'This is the unique ID of the book.'
```

```
;
```

```
ALTER TABLE HZS_BOOK_COPY
  ADD CONSTRAINT HZS_BOOK_COPY_PK PRIMARY KEY ( COPY_ID );
```

```
CREATE TABLE HZS_CUSTOMER
(
  CUSTOMER_ID NUMBER (20) NOT NULL ,
  L_NAME   VARCHAR2 (30) NOT NULL ,
  F_NAME   VARCHAR2 (30) NOT NULL ,
  PHONE    VARCHAR2 (20) NOT NULL ,
  EMAIL    VARCHAR2 (100) NOT NULL ,
  ID_TYPE  VARCHAR2 (20) NOT NULL ,
  ID_NUM   VARCHAR2 (50) NOT NULL
)
```

```
;
```

```
COMMENT ON COLUMN HZS_CUSTOMER.CUSTOMER_ID IS 'This is the unique ID of the
customer.'
```

```
;
```

```
COMMENT ON COLUMN HZS_CUSTOMER.L_NAME IS 'Last name of the customer.'
```

```
;
```

```
COMMENT ON COLUMN HZS_CUSTOMER.F_NAME IS 'First name of the customer.'
```

```
;
```

```
COMMENT ON COLUMN HZS_CUSTOMER.PHONE IS 'Customer contact number.'
```

```
;
```

```
COMMENT ON COLUMN HZS_CUSTOMER.EMAIL IS 'Customer email address.'
```

```
;
```

```
COMMENT ON COLUMN HZS_CUSTOMER.ID_TYPE IS 'Type of identification (Passport,
SSN, or Driver License).'
```

```
;
```

```
COMMENT ON COLUMN HZS_CUSTOMER.ID_NUM IS 'the sepecific number for the ID'
;
```

```
ALTER TABLE HZS_CUSTOMER
  ADD CONSTRAINT HZS_CUSTOMER_PK PRIMARY KEY ( CUSTOMER_ID );
```

```
CREATE TABLE HZS_EVENT
(
  EVENT_ID    NUMBER (20) NOT NULL ,
  E_NAME      VARCHAR2 (30) NOT NULL ,
  EVENT_TYPE   VARCHAR2 (1) NOT NULL ,
  START_DATETIME DATE NOT NULL ,
  STOP_DATETIME DATE NOT NULL ,
  TOPIC        VARCHAR2 (30) NOT NULL
)
;
```

```
ALTER TABLE HZS_EVENT
  ADD CONSTRAINT CH_INH_HZS_EVENT
  CHECK (EVENT_TYPE IN ('E', 'S'))
;
```

```
COMMENT ON COLUMN HZS_EVENT.EVENT_TYPE IS 'Seminar or Exhibition'
;
```

```
ALTER TABLE HZS_EVENT
  ADD CONSTRAINT HZS_EVENT_PK PRIMARY KEY ( EVENT_ID );
```

```
CREATE TABLE HZS_EXHIBITION
(
  EVENT_ID NUMBER (20) NOT NULL ,
  EXPENSE  NUMBER (10,2) NOT NULL
)
;
```

```
COMMENT ON COLUMN HZS_EXHIBITION.EXPENSE IS 'Expense of an exhibition.'
;
```

```
ALTER TABLE HZS_EXHIBITION
  ADD CONSTRAINT HZS_EXHIBITION_PKv1 PRIMARY KEY ( EVENT_ID );
```

```
CREATE TABLE HZS_EXHIBITION_ACCESS
(
  REGISTRATION_ID NUMBER (20) NOT NULL ,
```

```

    CUSTOMER_ID    NUMBER (20) ,
    EVENT_ID       NUMBER (20)
)
;

COMMENT ON COLUMN HZS_EXHIBITION_ACCESS.REGISTRATION_ID IS 'This is the
unique ID of the access.'
;

COMMENT ON COLUMN HZS_EXHIBITION_ACCESS.CUSTOMER_ID IS 'This is the unique
ID of the customer.'
;

ALTER TABLE HZS_EXHIBITION_ACCESS
  ADD CONSTRAINT HZS_EXHIBITION_ACCESS_PK PRIMARY KEY ( REGISTRATION_ID
);

CREATE TABLE HZS_INDIVIDUAL
(
  SPONSOR_ID NUMBER (20) NOT NULL ,
  F_NAME    VARCHAR2 (30) NOT NULL ,
  L_NAME    VARCHAR2 (30) NOT NULL
)
;

COMMENT ON COLUMN HZS_INDIVIDUAL.SPONSOR_ID IS 'This is the unique ID of the
sponsor.'
;

COMMENT ON COLUMN HZS_INDIVIDUAL.F_NAME IS 'First name of the individual sponsor.'
;

COMMENT ON COLUMN HZS_INDIVIDUAL.L_NAME IS 'Last name of the individual sponsor.'
;

ALTER TABLE HZS_INDIVIDUAL
  ADD CONSTRAINT HZS_INDIVIDUAL_PK PRIMARY KEY ( SPONSOR_ID ) ;

CREATE TABLE HZS_INVOICE
(
  INVOICE_ID    NUMBER NOT NULL ,
  INVOICE_DATE  DATE NOT NULL ,
  INVOIC__AMOUNT NUMBER (10,2) NOT NULL ,
  RENTAL_ID     NUMBER (20) NOT NULL

```



```

    )
;

```

```

COMMENT ON COLUMN HZS_INVOICE.INVOICE_ID IS 'This is the unique ID of the invoice.'
;

```

```

COMMENT ON COLUMN HZS_INVOICE.INVOICE_DATE IS 'The date when the invoice was
issued.'
;

```

```

COMMENT ON COLUMN HZS_INVOICE.INVOIC__AMOUNT IS 'The total amount to be paid
for the rental.'
;

```

```

ALTER TABLE HZS_INVOICE
ADD CONSTRAINT HZS_INVOICE_PK PRIMARY KEY ( INVOICE_ID );

```

```

CREATE TABLE HZS_ORGANIZATION
(
    SPONSOR_ID NUMBER (20) NOT NULL ,
    ORG_NAME  VARCHAR2 (50) NOT NULL
)
;

```

```

COMMENT ON COLUMN HZS_ORGANIZATION.SPONSOR_ID IS 'This is the unique ID of the
sponsor.'
;

```

```

COMMENT ON COLUMN HZS_ORGANIZATION.ORG_NAME IS 'The name of the sponsoring
organization.'
;

```

```

ALTER TABLE HZS_ORGANIZATION
ADD CONSTRAINT HZS_ORGANIZATION_PK PRIMARY KEY ( SPONSOR_ID );

```

```

CREATE TABLE HZS_PAYMENT
(
    PAYMENT_ID      NUMBER (20) NOT NULL ,
    PAYMENT_DATE    DATE NOT NULL ,
    METHOD           VARCHAR2 (5) NOT NULL ,
    CARD_HOLDER_L_NAME VARCHAR2 (30) NOT NULL ,
    CARD_HOLDER_F_NAME VARCHAR2 (30) NOT NULL ,
    AMOUNT          NUMBER (10,2) NOT NULL ,
    INVOICE_ID      NUMBER (20) NOT NULL
)

```

```

    )
;

COMMENT ON COLUMN HZS_PAYMENT.PAYMENT_ID IS 'This is the unique ID of the
payment transaction.'
;

COMMENT ON COLUMN HZS_PAYMENT.PAYMENT_DATE IS 'The date when the payment
was made.'
;

COMMENT ON COLUMN HZS_PAYMENT.METHOD IS 'Payment method used (Cash, Credit,
Debit, PayPal).'
;

COMMENT ON COLUMN HZS_PAYMENT.CARD_HOLDER_L_NAME IS 'Last name of the
cardholder.'
;

COMMENT ON COLUMN HZS_PAYMENT.CARD_HOLDER_F_NAME IS 'First name of the
cardholder.'
;

COMMENT ON COLUMN HZS_PAYMENT.AMOUNT IS 'The amount paid in the transaction.'
;

COMMENT ON COLUMN HZS_PAYMENT.INVOICE_ID IS 'This is the unique ID of the invoice.'
;

ALTER TABLE HZS_PAYMENT
  ADD CONSTRAINT HZS_PAYMENT_PK PRIMARY KEY ( PAYMENT_ID );

CREATE TABLE HZS_RENTAL
(
  RENTAL_ID      NUMBER (20) NOT NULL ,
  RENTAL_STATUS  VARCHAR2 (10) NOT NULL ,
  BORROW_DATE    DATE NOT NULL ,
  EXPECTED_RETURN_DATE DATE NOT NULL ,
  ACTUAL_RETURN_DATE DATE ,
  CUSTOMER_ID    NUMBER (20) ,
  COPY_ID        NUMBER (20) NOT NULL
)
;

```

```
ALTER TABLE HZS_RENTAL
  ADD CONSTRAINT HZS_RENTAL_PK PRIMARY KEY ( RENTAL_ID ) ;
```

```
CREATE TABLE HZS_ROOM_RESERVATION
(
  RESERVATION_ID  NUMBER (20) NOT NULL ,
  TOPIC_DESCRIPTION VARCHAR2 (100) NOT NULL ,
  "DATE"         DATE NOT NULL ,
  START_TIME     DATE NOT NULL ,
  END_TIME       DATE NOT NULL ,
  GROUP_SIZE     NUMBER (4) NOT NULL ,
  CUSTOMER_ID    NUMBER (20) ,
  ROOM_ID        NUMBER (20) ,
  L_NAME         VARCHAR2 (30) NOT NULL ,
  F_NAME         VARCHAR2 (30) NOT NULL
)
```

```
;
```

```
COMMENT ON COLUMN HZS_ROOM_RESERVATION.RESERVATION_ID IS 'This is the
unique ID of the room reservation.'
```

```
;
```

```
COMMENT ON COLUMN HZS_ROOM_RESERVATION.TOPIC_DESCRIPTION IS 'A brief
description of the study topic for the reservation.'
```

```
;
```

```
COMMENT ON COLUMN HZS_ROOM_RESERVATION."DATE" IS 'The date on which the
study room is reserved.'
```

```
;
```

```
COMMENT ON COLUMN HZS_ROOM_RESERVATION.START_TIME IS 'The start time of the
study room reservation.'
```

```
;
```

```
COMMENT ON COLUMN HZS_ROOM_RESERVATION.END_TIME IS 'The end time of the
study room reservation.'
```

```
;
```

```
COMMENT ON COLUMN HZS_ROOM_RESERVATION.GROUP_SIZE IS 'The total number of
people in the group reservation.'
```

```
;
```

```
COMMENT ON COLUMN HZS_ROOM_RESERVATION.CUSTOMER_ID IS 'This is the unique
ID of the customer.'
```

```
;
```

```
COMMENT ON COLUMN HZS_ROOM_RESERVATION.ROOM_ID IS 'This is the unique ID of
the room.'
```

```
;
```

```
COMMENT ON COLUMN HZS_ROOM_RESERVATION.L_NAME IS 'Last name of the person
who made the reservation.'
```

```
;
```

```
COMMENT ON COLUMN HZS_ROOM_RESERVATION.F_NAME IS 'First name of the person
who made the reservation.'
```

```
;
```

```
ALTER TABLE HZS_ROOM_RESERVATION
  ADD CONSTRAINT HZS_ROOM_RESERVATION_PK PRIMARY KEY ( RESERVATION_ID )
```

```
;
```

```
CREATE TABLE HZS_SEMINAR
(
  EVENT_ID NUMBER (20) NOT NULL ,
  DESCRIP VARCHAR2 (100) NOT NULL
)
```

```
;
```

```
COMMENT ON COLUMN HZS_SEMINAR.DESCRIP IS 'Description of a seminar'
```

```
;
```

```
ALTER TABLE HZS_SEMINAR
  ADD CONSTRAINT HZS_SEMINAR_PKv1 PRIMARY KEY ( EVENT_ID ) ;
```

```
CREATE TABLE HZS_SEMINAR_ACCESS
(
  INVITATION_ID VARCHAR2 (20) NOT NULL ,
  AUTHOR_ID   NUMBER (20) ,
  EVENT_ID    NUMBER (20)
)
```

```
;
```

```
COMMENT ON COLUMN HZS_SEMINAR_ACCESS.INVITATION_ID IS 'This is the unique ID
of the invitation.'
```

```
;
```

COMMENT ON COLUMN HZS_SEMINAR_ACCESS.AUTHOR_ID IS 'This is the unique ID of the author.'

;

ALTER TABLE HZS_SEMINAR_ACCESS
ADD CONSTRAINT HZS_SEMINAR_ACCESS_PK PRIMARY KEY (INVITATION_ID);

CREATE TABLE HZS_SEMINAR_SPONSOR

(
SPONSOR_ID NUMBER (20) NOT NULL ,
EVENT_ID NUMBER (20) NOT NULL ,
AMOUNT NUMBER (10,2) NOT NULL
)

;

COMMENT ON COLUMN HZS_SEMINAR_SPONSOR.AMOUNT IS 'The amount sponsored for a seminar.'

;

ALTER TABLE HZS_SEMINAR_SPONSOR
ADD CONSTRAINT HZS_SEMINAR_SPONSOR_PK PRIMARY KEY (EVENT_ID,
SPONSOR_ID);

CREATE TABLE HZS_SPONSOR

(
SPONSOR_ID NUMBER (20) NOT NULL ,
SPONSOR_TYPE VARCHAR2 (1) NOT NULL
)

;

ALTER TABLE HZS_SPONSOR
ADD CONSTRAINT CH_INH_HZS_SPONSOR
CHECK (SPONSOR_TYPE IN ('I', 'O'))

;

COMMENT ON COLUMN HZS_SPONSOR.SPONSOR_ID IS 'This is the unique ID of the sponsor.'

;

COMMENT ON COLUMN HZS_SPONSOR.SPONSOR_TYPE IS 'The type of sponsor (Individual or Organization).'

;

ALTER TABLE HZS_SPONSOR

```
ADD CONSTRAINT HZS_SPONSOR_PK PRIMARY KEY ( SPONSOR_ID ) ;
```

```
CREATE TABLE HZS_STUDY_ROOM
(
  ROOM_ID NUMBER (20) NOT NULL ,
  CAPACITY NUMBER (2) NOT NULL
)
;
```

```
COMMENT ON COLUMN HZS_STUDY_ROOM.ROOM_ID IS 'This is the unique ID of the
room.'
;
```

```
COMMENT ON COLUMN HZS_STUDY_ROOM.CAPACITY IS 'The maximum number of
people the room can hold.'
;
```

```
ALTER TABLE HZS_STUDY_ROOM
ADD CONSTRAINT HZS_STUDY_ROOM_PK PRIMARY KEY ( ROOM_ID ) ;
```

```
ALTER TABLE HZS_BOOK_AUTHOR
ADD CONSTRAINT BOOK_AUTHOR_AUTHOR_FK FOREIGN KEY
(
  AUTHOR_ID
)
REFERENCES HZS_AUTHOR
(
  AUTHOR_ID
)
;
```

```
ALTER TABLE HZS_BOOK_AUTHOR
ADD CONSTRAINT BOOK_AUTHOR_BOOK_FK FOREIGN KEY
(
  BOOK_ID
)
REFERENCES HZS_BOOK
(
  BOOK_ID
)
;
```

```
ALTER TABLE HZS_EXHIBITION_ACCESS
ADD CONSTRAINT EXHIBITION_ACC_CUSTOMER_FK FOREIGN KEY
```

```

(
  CUSTOMER_ID
)
REFERENCES HZS_CUSTOMER
(
  CUSTOMER_ID
)
;

ALTER TABLE HZS_EXHIBITION_ACCESS
  ADD CONSTRAINT EXHIBITION_ACC_EXHIBITION_FK FOREIGN KEY
    (
      EVENT_ID
    )
  REFERENCES HZS_EXHIBITION
    (
      EVENT_ID
    )
;

ALTER TABLE HZS_BOOK_COPY
  ADD CONSTRAINT HZS_BOOK_COPY_HZS_BOOK_FK FOREIGN KEY
    (
      BOOK_ID
    )
  REFERENCES HZS_BOOK
    (
      BOOK_ID
    )
;

ALTER TABLE HZS_EXHIBITION
  ADD CONSTRAINT HZS_EXHIBITION_HZS_EVENT_FK FOREIGN KEY
    (
      EVENT_ID
    )
  REFERENCES HZS_EVENT
    (
      EVENT_ID
    )
;

ALTER TABLE HZS_INDIVIDUAL
  ADD CONSTRAINT HZS_INDIVIDUAL_HZS_SPONSOR_FK FOREIGN KEY

```

```
(
  SPONSOR_ID
)
REFERENCES HZS_SPONSOR
(
  SPONSOR_ID
)
;

ALTER TABLE HZS_INVOICE
  ADD CONSTRAINT HZS_INVOICE_HZS_RENTAL_FK FOREIGN KEY
  (
    RENTAL_ID
  )
  REFERENCES HZS_RENTAL
  (
    RENTAL_ID
  )
;

ALTER TABLE HZS_PAYMENT
  ADD CONSTRAINT HZS_PAYMENT_HZS_INVOICE_FK FOREIGN KEY
  (
    INVOICE_ID
  )
  REFERENCES HZS_INVOICE
  (
    INVOICE_ID
  )
;

ALTER TABLE HZS_RENTAL
  ADD CONSTRAINT HZS_RENTAL_HZS_BOOK_COPY_FK FOREIGN KEY
  (
    COPY_ID
  )
  REFERENCES HZS_BOOK_COPY
  (
    COPY_ID
  )
;

ALTER TABLE HZS_RENTAL
  ADD CONSTRAINT HZS_RENTAL_HZS_CUSTOMER_FK FOREIGN KEY
```



```
(
  CUSTOMER_ID
)
REFERENCES HZS_CUSTOMER
(
  CUSTOMER_ID
)
;

ALTER TABLE HZS_SEMINAR
  ADD CONSTRAINT HZS_SEMINAR_HZS_EVENT_FK FOREIGN KEY
  (
    EVENT_ID
  )
  REFERENCES HZS_EVENT
  (
    EVENT_ID
  )
;

ALTER TABLE HZS_ORGANIZATION
  ADD CONSTRAINT ORGANIZATION_SPONSOR_FK FOREIGN KEY
  (
    SPONSOR_ID
  )
  REFERENCES HZS_SPONSOR
  (
    SPONSOR_ID
  )
;

ALTER TABLE HZS_ROOM_RESERVATION
  ADD CONSTRAINT RESERVATION_CUSTOMER_FK FOREIGN KEY
  (
    CUSTOMER_ID
  )
  REFERENCES HZS_CUSTOMER
  (
    CUSTOMER_ID
  )
;

ALTER TABLE HZS_ROOM_RESERVATION
  ADD CONSTRAINT RESERVATION_STUDY_ROOM_FK FOREIGN KEY
```

```

(
  ROOM_ID
)
REFERENCES HZS_STUDY_ROOM
(
  ROOM_ID
)
;

ALTER TABLE HZS_SEMINAR_ACCESS
  ADD CONSTRAINT SEMINAR_ACCESS_SEMINAR_FK FOREIGN KEY
  (
    EVENT_ID
  )
  REFERENCES HZS_SEMINAR
  (
    EVENT_ID
  )
;

ALTER TABLE HZS_SEMINAR_ACCESS
  ADD CONSTRAINT SEMINAR_AUTHOR_FK FOREIGN KEY
  (
    AUTHOR_ID
  )
  REFERENCES HZS_AUTHOR
  (
    AUTHOR_ID
  )
;

ALTER TABLE HZS_SEMINAR_SPONSOR
  ADD CONSTRAINT SEMINAR_SPONSOR_SPONSOR_FK FOREIGN KEY
  (
    SPONSOR_ID
  )
  REFERENCES HZS_SPONSOR
  (
    SPONSOR_ID
  )
;

ALTER TABLE HZS_SEMINAR_SPONSOR
  ADD CONSTRAINT SPONSOR_SEMINAR_FK FOREIGN KEY

```

```
(
  EVENT_ID
)
REFERENCES HZS_SEMINAR
(
  EVENT_ID
)
;
```

```
CREATE OR REPLACE TRIGGER ARC_FKArc_5_HZS_ORGANIZATION
BEFORE INSERT OR UPDATE OF SPONSOR_ID
ON HZS_ORGANIZATION
FOR EACH ROW
DECLARE
  d VARCHAR2 (1);
BEGIN
  SELECT A.SPONSOR_TYPE INTO d
  FROM HZS_SPONSOR A
  WHERE A.SPONSOR_ID = :new.SPONSOR_ID;
  IF (d IS NULL OR d <> 'O') THEN
    raise_application_error(-20223,'FK ORGANIZATION_SPONSOR_FK in Table
HZS_ORGANIZATION violates Arc constraint on Table HZS_SPONSOR - discriminator column
SPONSOR_TYPE doesn't have value "O"');
  END IF;
  EXCEPTION
  WHEN NO_DATA_FOUND THEN
    NULL;
  WHEN OTHERS THEN
    RAISE;
END;
/
```

```
CREATE OR REPLACE TRIGGER ARC_FKArc_5_HZS_INDIVIDUAL
BEFORE INSERT OR UPDATE OF SPONSOR_ID
ON HZS_INDIVIDUAL
FOR EACH ROW
DECLARE
  d VARCHAR2 (1);
BEGIN
  SELECT A.SPONSOR_TYPE INTO d
  FROM HZS_SPONSOR A
  WHERE A.SPONSOR_ID = :new.SPONSOR_ID;
  IF (d IS NULL OR d <> 'I') THEN
```

```

        raise_application_error(-20223,'FK HZS_INDIVIDUAL_HZS_SPONSOR_FK in Table
HZS_INDIVIDUAL violates Arc constraint on Table HZS_SPONSOR - discriminator column
SPONSOR_TYPE doesn't have value "I");
    END IF;
    EXCEPTION
    WHEN NO_DATA_FOUND THEN
        NULL;
    WHEN OTHERS THEN
        RAISE;
END;
/

```

```

CREATE OR REPLACE TRIGGER ARC_FKArc_4_HZS_EXHIBITION
BEFORE INSERT OR UPDATE OF EVENT_ID
ON HZS_EXHIBITION
FOR EACH ROW
DECLARE
    d VARCHAR2 (1);
BEGIN
    SELECT A.EVENT_TYPE INTO d
    FROM HZS_EVENT A
    WHERE A.EVENT_ID = :new.EVENT_ID;
    IF (d IS NULL OR d <> 'E') THEN
        raise_application_error(-20223,'FK HZS_EXHIBITION_HZS_EVENT_FK in Table
HZS_EXHIBITION violates Arc constraint on Table HZS_EVENT - discriminator column
EVENT_TYPE doesn't have value "E");
    END IF;
    EXCEPTION
    WHEN NO_DATA_FOUND THEN
        NULL;
    WHEN OTHERS THEN
        RAISE;
END;
/

```

```

CREATE OR REPLACE TRIGGER ARC_FKArc_4_HZS_SEMINAR
BEFORE INSERT OR UPDATE OF EVENT_ID
ON HZS_SEMINAR
FOR EACH ROW
DECLARE
    d VARCHAR2 (1);
BEGIN
    SELECT A.EVENT_TYPE INTO d
    FROM HZS_EVENT A

```

```

WHERE A.EVENT_ID = :new.EVENT_ID;
IF (d IS NULL OR d <> 'S') THEN
    raise_application_error(-20223,'FK HZS_SEMINAR_HZS_EVENT_FK in Table
HZS_SEMINAR violates Arc constraint on Table HZS_EVENT - discriminator column
EVENT_TYPE doesn't have value "S"');
END IF;
EXCEPTION
WHEN NO_DATA_FOUND THEN
    NULL;
WHEN OTHERS THEN
    RAISE;
END;
/

```

-- Oracle SQL Developer Data Modeler Summary Report:

```

--
-- CREATE TABLE          19
-- CREATE INDEX           0
-- ALTER TABLE          40
-- CREATE VIEW            0
-- ALTER VIEW            0
-- CREATE PACKAGE         0
-- CREATE PACKAGE BODY    0
-- CREATE PROCEDURE       0
-- CREATE FUNCTION        0
-- CREATE TRIGGER         4
-- ALTER TRIGGER          0
-- CREATE COLLECTION TYPE      0
-- CREATE STRUCTURED TYPE      0
-- CREATE STRUCTURED TYPE BODY 0
-- CREATE CLUSTER           0
-- CREATE CONTEXT           0
-- CREATE DATABASE          0
-- CREATE DIMENSION         0
-- CREATE DIRECTORY         0
-- CREATE DISK GROUP         0
-- CREATE ROLE              0
-- CREATE ROLLBACK SEGMENT    0
-- CREATE SEQUENCE          0
-- CREATE MATERIALIZED VIEW   0
-- CREATE MATERIALIZED VIEW LOG 0
-- CREATE SYNONYM           0

```

-- CREATE TABLESPACE	0
-- CREATE USER	0
--	
-- DROP TABLESPACE	0
-- DROP DATABASE	0
--	
-- REDACTION POLICY	0
-- TSDP POLICY	0
--	
-- ORDS DROP SCHEMA	0
-- ORDS ENABLE SCHEMA	0
-- ORDS ENABLE OBJECT	0
--	
-- ERRORS	0
-- WARNINGS	0