Dormitory Accommodation Term Project

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**Business Rules and Assumptions**

**Entities Identified**

ResidenceOffice

Hall

Inspector

StudentApartments

Student

Room

Advisor

Course

Instructor

Bedroom

Next-of-kin

Lease

Invoice

**Relationships**

|  |  |  |  |
| --- | --- | --- | --- |
| **Entity** | **Connectivity** | **Relationship** | **Entity** |
| ResidenceOffice | 1…M | provides | StudentApartments |
| Hall | 1…M | Can provide | Room |
| Inspector | 1…M | inspects | StudentApartments |
| StudentApartments | 1…M | has | Room |
| Student | M…1 | rents | StudentApartments |
| Student | 1…1 | can rent | Room |
| Room | 1…1 | has | Bedroom |
| Student | 1…1 | is assigned | Advisor |
| ResidenceOffice | 1…M | has info on | Course |
| Student | 1…1 | associated with | Course |
| Student | 1…1 | receives | Lease |
| Student | 1…1 | Is sent | Invoice |
| Student | 1…1 | Has a | Next-of-kin |
| MemberofStaff | M…1 | Is stored | ResidenceOffice |
| MemberOfStaff | 1…1 | Stores info about | Instructor |

**ERD Diagram**

**Diagram, schematic

Description automatically generated**

**Data Dictionary**

STUDENT

|  |  |  |  |
| --- | --- | --- | --- |
| Field Name | Data type | Field Length | Constraint |
| Student# | Number | 5 | Primary Key |
| fName | VARCHAR | 15 | Null |
| lName | VARCHAR | 15 | Null |
| address | VARCHAR | 30 | Null |
| dob | DATE | Null | Null |
| sex | VARCHAR | 6 | Null |
| s\_degree | VARCHAR | 4 | Null |

FLAT

|  |  |  |  |
| --- | --- | --- | --- |
| Field Name | Data type | Field Length | Constraint |
| flat# | NUMBER | 2 | Null |
| flat\_addr | VARCHAR | 20 | Null |
| rooms | NUMBER | 1 | Null |

ROOM

|  |  |  |  |
| --- | --- | --- | --- |
| Field Name | Data type | Field Length | Constraint |
| room# | NUMBER | 2 | Primary Key |
| rent | NUMBER | Null | Null |
| flat# | NUMBER | 2 | Foreign Key |

COURSE

|  |  |  |  |
| --- | --- | --- | --- |
| Field Name | Data type | Field Length | Constraint |
| code | VARCHAR | 10 | Primary Key |
| course\_name | VARCHAR | 30 | Null |
| instructor | VARCHAR | 10 | Null |

STAFF

|  |  |  |  |
| --- | --- | --- | --- |
| Field Name | Data type | Field Length | Constraint |
| staff# | NUMBER | 3 | Primary Key |
| fname | VARCHAR | 10 | Null |
| lname | VARCHAR | 10 | Null |
| addr | VARCHAR | 6 | Null |
| staff\_position | VARCHAR | 15 | Null |
| age | NUMBER | 3 | Null |
| location | VARCHAR | 20 | Null |

LEASE

|  |  |  |  |
| --- | --- | --- | --- |
| Field Name | Data type | Field Length | Constraint |
| lease# | VARCHAR | 5 | Primary Key |
| l\_length | NUMBER |  | Null |
| student# | NUMBER | 5 | Null |
| room# | NUMBER | 2 | Null |
| end\_date | DATE | Null | Null |

INVOICE

|  |  |  |  |
| --- | --- | --- | --- |
| Field Name | Data type | Field Length | Constraint |
| invoice# | NUMBER | 3 | Primary Key |
| payment | NUMBER |  | Null |
| payment\_date | DATE | Null | Null |
| payment\_type | VARCHAR | 6 | Null |
| lease# | VARCHAR | 6 | Foreign Key |

INSPECTION

|  |  |  |  |
| --- | --- | --- | --- |
| Field Name | Data type | Field Length | Constraint |
| flat# | NUMBER | 2 | Primary Key |
| date\_of\_insp | DATE | Null | Null |
| remarks | VARCHAR | 6 | Null |
| staff# | NUMBER | 3 | Null |

SERVICE

|  |  |  |  |
| --- | --- | --- | --- |
| Field Name | Data type | Field Length | Constraint |
| service# | NUMBER | 3 | Primary Key |
| staff# | NUMBER | 3 | Foreign Key |

GUARDIAN

|  |  |  |  |
| --- | --- | --- | --- |
| Field Name | Data type | Field Length | Constraint |
| student# | NUMBER | 5 | Foreign Key |
| s\_name | VARCHAR | 10 | Null |
| guar\_addr | VARCHAR | 25 | Null |
| tele | NUMBER | 12 | Null |

ADVISER

|  |  |  |  |
| --- | --- | --- | --- |
| Field Name | Data type | Field Length | Constraint |
| fname | VARCHAR | 10 | Null |
| lname | VARCHAR | 10 | Null |
| staff\_position | VARCHAR | 15 | Null |
| tele | VARCHAR | 12 | Null |
| Student# | NUMBER | 5 | Foreign Key |

**Database Physical Model**

**Data Definition Language(DDL) Used**

CREATE TABLE STUDENT(

Student# NUMBER(5) NOT NULL,

fName VARCHAR(15),

lName VARCHAR(15),

address VARCHAR(30),

dob DATE,

sex VARCHAR(6),

s\_degree VARCHAR(4),

PRIMARY KEY (Student#));

CREATE TABLE FLAT(

flat# NUMBER(2),

flat\_addr VARCHAR(20),

rooms NUMBER(1),

PRIMARY KEY (flat#));

CREATE TABLE ROOM(

room# NUMBER(2),

rent NUMBER,

flat# NUMBER(2),

PRIMARY KEY (room#),

FOREIGN KEY (flat#) REFERENCES FLAT(flat#));

CREATE TABLE COURSE(

code VARCHAR(10),

course\_name VARCHAR(30),

instructor VARCHAR(10),

PRIMARY KEY (code));

CREATE TABLE STAFF(

staff# NUMBER(3),

fname VARCHAR(10),

lname VARCHAR(10),

addr VARCHAR(6),

staff\_position VARCHAR(15),

age NUMBER(3),

location VARCHAR(20),

PRIMARY KEY (staff#));

CREATE TABLE LEASE(

lease# VARCHAR(5),

l\_length NUMBER,

student# NUMBER(5),

room# NUMBER(2),

commence\_date DATE,

end\_date DATE,

PRIMARY KEY(lease#),

FOREIGN KEY (student#) REFERENCES STUDENT(Student#),

FOREIGN KEY (room#) REFERENCES ROOM(room#));

CREATE TABLE INVOICE(

invoice# NUMBER(3),

payment NUMBER,

payment\_date DATE,

payment\_type VARCHAR(6),

lease# VARCHAR(5),

PRIMARY KEY(invoice#),

FOREIGN KEY(lease#) REFERENCES LEASE(lease#));

CREATE TABLE INSPECTION(

flat# NUMBER(2),

date\_of\_insp DATE,

remarks VARCHAR(6),

staff# NUMBER(3),

FOREIGN KEY (flat#) REFERENCES FLAT(flat#),

FOREIGN KEY(staff#) REFERENCES STAFF(staff#));

CREATE TABLE SERVICE(

service# NUMBER(3),

staff# NUMBER(3),

PRIMARY KEY(service#),

FOREIGN KEY(staff#) REFERENCES STAFF(staff#));

CREATE TABLE GUARDIAN(

student# NUMBER(5),

name VARCHAR(10),

guar\_addr VARCHAR(25),

tele NUMBER(12),

FOREIGN KEY(student#) REFERENCES STUDENT(Student#));

CREATE TABLE HALL(

Hall\_NameVARCHAR(20),

Addr VARCHAR (20) NOT NULL,

phone# NUMBER (12gu) NOT NULL,

manager\_Name VARCHAR (20) NOT NULL,

hall\_room VARCHAR (20) NOT NULL,

monthly\_rent VARCHAR (20) NOT NULL,

place# NUMBER (12) NOT NULL

);

CREATE TABLE ADVISER

AS SELECT fname, lname, staff\_position

FROM STAFF;

**Data Manipulation Language(DML) Used**

INSERT INTO STUDENT VALUES (1000, 'John', 'Murphy', '2, Roebuck Castle', '01-23-1993', 'Male', 'BSc');

INSERT INTO STUDENT VALUES (1001, 'Jennifer', 'Neary', '25, St Patricks Park', '02-02-1992', 'Female', 'BA');

INSERT INTO STUDENT VALUES (1002, 'Xiang', 'Yao', '45, Belfield Downs', '12-23-1988', 'Male', 'MSc');

INSERT INTO STUDENT VALUES (1003, 'Ram', 'Nathan', '23, Woodbine Avenue', '03-03-1994', 'Male', 'BE');

INSERT INTO STUDENT VALUES (1004, 'Sebastian', 'Gallardo', '11, Mount Merrion Av', '04-13-1987', 'Male', 'MBA');

INSERT INTO STUDENT VALUES (1005, 'Ania', 'Borges', '67, Booterstown Road', '08-09-1994', 'Female', 'BA');

INSERT INTO STUDENT VALUES (1006, 'Francesca', 'Spencer', '55, Stradbrook Park', '09-05-1993', 'Female', 'BA');

INSERT INTO STUDENT VALUES (1007, 'Chenzhui', 'Li', '9, Avoca Avenue', '11-19-1994', 'Female', 'MSc');

INSERT INTO STUDENT VALUES (1008, 'Rahul', 'Kumar','27, Arlington Plaza', '08-15-1989', 'Male', 'PhD');

INSERT INTO STUDENT VALUES (1009, 'Eric', 'Wallner', '43, Muckross House', '03-31-1990', 'Male', 'BA');

INSERT INTO STUDENT VALUES (1010, 'Orla', 'Fitz', '2, Roebuck Castle', '01-23-1993', 'Male', 'BSc');

A screenshot of a computer

Description automatically generated with medium confidence

INSERT INTO FLAT VALUES (1, '2, Mount Merrion', 4);

INSERT INTO FLAT VALUES (2, '3, Mount Merrion', 5);

INSERT INTO FLAT VALUES (3, '3, Mount Merrion', 5);

INSERT INTO FLAT VALUES (4, '3, Mount Merrion', 5);

INSERT INTO FLAT VALUES (5, '2, Mount Merrion', 4);

INSERT INTO FLAT VALUES (6, '2, Mount Merrion', 4);

INSERT INTO FLAT VALUES (7, '2, Mount Merrion', 4);

INSERT INTO FLAT VALUES (8, '5, Mount Merrion', 6);

INSERT INTO FLAT VALUES (9, '5, Mount Merrion', 6);

INSERT INTO FLAT VALUES (10,'5, Mount Merrion', 6);

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Description automatically generated with medium confidence

INSERT INTO ROOM VALUES (21, 500, 2);

INSERT INTO ROOM VALUES (22, 500, 2);

INSERT INTO ROOM VALUES (11, 600, 1);

INSERT INTO ROOM VALUES (12, 600, 5);

INSERT INTO ROOM VALUES (13, 600, 1);

INSERT INTO ROOM VALUES (23, 500, 4);

INSERT INTO ROOM VALUES (31, 450, 9);

INSERT INTO ROOM VALUES (32, 450, 10);

INSERT INTO ROOM VALUES (33, 450, 8);

INSERT INTO ROOM VALUES (24, 500, 4);

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Description automatically generated with medium confidence

INSERT INTO COURSE VALUES ('PROG1002', 'Programming', 'John');

INSERT INTO COURSE VALUES ('ENGL1202', 'English II', 'Ciara');

INSERT INTO COURSE VALUES ('CHEM2013', 'Chemistry', 'Ruth');

INSERT INTO COURSE VALUES ('MECH4001', 'Mechanical', 'Louis');

INSERT INTO COURSE VALUES ('INTR2145', 'Introduction', 'Nina');

INSERT INTO COURSE VALUES ('OPSY4516', 'Operating Systems', 'Emma');

INSERT INTO COURSE VALUES ('SFEN7841', 'Software', 'Liz');

INSERT INTO COURSE VALUES ('IMGT8201', 'Emerging Technologies', 'Hazel');

INSERT INTO COURSE VALUES ('MNGT1001', 'Management', 'Mark');

INSERT INTO COURSE VALUES ('MATH1011', 'Math I', 'Rachel');

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Description automatically generated with medium confidence

INSERT INTO STAFF VALUES (201, 'Gavin', 'Conor', 'B 201', 'Manager',69, 'Residence Office');

INSERT INTO STAFF VALUES (202, 'Brendan', 'Murphy', 'A 101', 'Accountant',42, 'Residence Office');

INSERT INTO STAFF VALUES (203, 'Gerry', 'Bowen', 'A 102', 'Security',33, 'Hall');

INSERT INTO STAFF VALUES (204, 'Fiona', 'Blake', 'C 103', 'Lecturer',64,'Residence Office');

INSERT INTO STAFF VALUES (205, 'Gareth', 'Burke', 'C 101', 'Administrator',70, 'Hall');

INSERT INTO STAFF VALUES (206, 'Neil', 'Green', 'B 202', 'Custodian',29, 'Residence Office');

INSERT INTO STAFF VALUES (207, 'Mark', 'Simpson', 'B 203', 'IT Manager',36, 'Hall');

INSERT INTO STAFF VALUES (208, 'Ashley', 'Spencer', 'C 104', 'Lecturer',45, 'Hall');

INSERT INTO STAFF VALUES (209, 'Ramnik', 'Singh', 'A 103', 'Security',27, 'Residence Office');

INSERT INTO STAFF VALUES (210, 'Eric', 'Shups', 'C 102', 'Custodian',62, 'Hall');

A picture containing graphical user interface

Description automatically generated

INSERT INTO LEASE VALUES ('L-001', 30, 1000, 11, '09-01-2014', '10-01-2014');

INSERT INTO LEASE VALUES ('L-002', 60, 1001, 21, '09-01-2014', '11-01-2014');

INSERT INTO LEASE VALUES ('L-003', 30, 1002, 31, '01-01-2015', '02-01-2015');

INSERT INTO LEASE VALUES ('L-004', 60, 1003, 12, '01-01-2015', '03-01-2015');

INSERT INTO LEASE VALUES ('L-005', 90, 1004, 22, '09-01-2014', '12-01-2014');

INSERT INTO LEASE VALUES ('L-006', 90, 1005, 23, '09-01-2014', '12-01-2014');

INSERT INTO LEASE VALUES ('L-007', 90, 1006, 13, '09-01-2014', '12-01-2014');

INSERT INTO LEASE VALUES ('L-008', 120, 1007, 32,'01-01-2015', '05-01-2015');

INSERT INTO LEASE VALUES ('L-009', 30, 1008, 33, '09-01-2014', '10-01-2014');

INSERT INTO LEASE VALUES ('L-010', 30, 1009, 24, '03-01-2014', '04-01-2014');

A screenshot of a computer

Description automatically generated with medium confidence

INSERT INTO INVOICE VALUES (141, 600.00, '10-01-2014', 'Cash', 'L-001');

INSERT INTO INVOICE VALUES (142, 1000.00, '11-01-2014', 'Cheque', 'L-002');

INSERT INTO INVOICE VALUES (143, 1250.00, '02-01-2015', 'Cash', 'L-003');

INSERT INTO INVOICE VALUES (144, 1200.00, '03-01-2015', 'Card', 'L-004');

INSERT INTO INVOICE VALUES (145, 1500.00, '12-01-2014', 'Cash', 'L-005');

INSERT INTO INVOICE VALUES (146, 1500.00, '12-01-2014', 'Card', 'L-006');

INSERT INTO INVOICE VALUES (147, 1800.00, '12-01-2014', 'Card', 'L-007');

INSERT INTO INVOICE VALUES (148, 1800.00, '05-01-2015', 'Cheque', 'L-008');

INSERT INTO INVOICE VALUES (149, 450.00, '10-01-2014', 'Cheque', 'L-009');

INSERT INTO INVOICE VALUES (150, 500.00, '04-01-2014', 'Cash', 'L-010');

A screenshot of a computer

Description automatically generated with medium confidence

INSERT INTO INSPECTION VALUES (1, '10-15-2014', 'Clean', 201);

INSERT INTO INSPECTION VALUES (2, '10-15-2014', 'Dirty', 201);

INSERT INTO INSPECTION VALUES (3, '10-15-2015', 'Smelly', 205);

INSERT INTO INSPECTION VALUES (4, '10-15-2014', 'Clean', 205);

INSERT INTO INSPECTION VALUES (5, '10-15-2014', 'Dirty', 201);

INSERT INTO INSPECTION VALUES (6, '10-01-2014', 'Clean', 207);

INSERT INTO INSPECTION VALUES (7, '10-25-2014', 'Clean', 201);

INSERT INTO INSPECTION VALUES (8, '04-15-2015', 'Smelly', 205);

INSERT INTO INSPECTION VALUES (9, '03-05-2015', 'Clean', 207);

INSERT INTO INSPECTION VALUES (10,'10-15-2014', 'Dirty', 207);

A screenshot of a computer

Description automatically generated with medium confidence

INSERT INTO SERVICE VALUES (301, 201);

INSERT INTO SERVICE VALUES (302, 201);

INSERT INTO SERVICE VALUES (303, 205);

INSERT INTO SERVICE VALUES (304, 207);

INSERT INTO SERVICE VALUES (305, 201);

INSERT INTO SERVICE VALUES (306, 201);

INSERT INTO SERVICE VALUES (307, 205);

INSERT INTO SERVICE VALUES (308, 207);

INSERT INTO SERVICE VALUES (309, 205);

INSERT INTO SERVICE VALUES (310, 207);

A screenshot of a computer screen

Description automatically generated with medium confidence

INSERT INTO GUARDIAN VALUES (1000, 'Teddy', '2, Roebuck Castle', 868-037-1353);

INSERT INTO GUARDIAN VALUES (1001, 'Peter', '28, St Patricks Park', 868-234-1532);

INSERT INTO GUARDIAN VALUES (1002, 'John', '24, Stradbrook Park', 868-432-4634);

INSERT INTO GUARDIAN VALUES (1003, 'Fiona', '34, Fosters Av', 868-343-4344);

INSERT INTO GUARDIAN VALUES (1004, 'James', '43, Georges Street', 868-302-3423);

INSERT INTO GUARDIAN VALUES (1005, 'Gerald', '21, Avoca Avenue', 868-703-2123);

INSERT INTO GUARDIAN VALUES (1006, 'Hazel', '28, St Patricks Park', 868-601-3213);

INSERT INTO GUARDIAN VALUES (1007, 'Brendan', '2, The Gallops', 868-243-2311);

INSERT INTO GUARDIAN VALUES (1008, 'Oonagh', '23, Delgany Cottages', 868-224-2424);

INSERT INTO GUARDIAN VALUES (1009, 'Emma', '12, Diagonal Alley', 868-323-4241);

INSERT INTO GUARDIAN VALUES (1010, 'Rupert', '45, Leaky Cauldron', 868-345-2141);A screenshot of a computer

Description automatically generated with medium confidence

ALTER TABLE ADVISER

ADD Tele VARCHAR(12);

ALTER TABLE ADVISER

ADD student# NUMBER(5);

ALTER TABLE ADVISER

ADD FOREIGN KEY(student#)

REFERENCES STUDENT(student#);

A screenshot of a computer

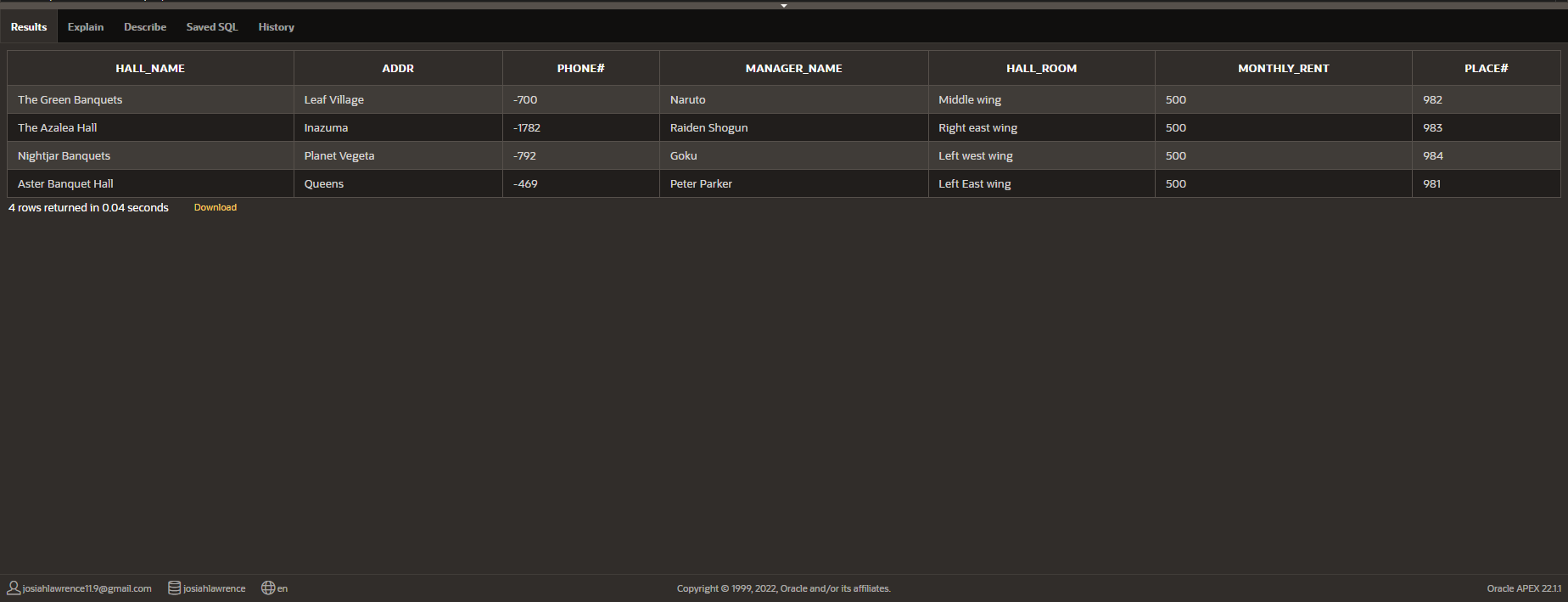
Description automatically generated with medium confidence

INSERT INTO HALL VALUES('Aster Banquet Hall', 'Left East wing' , 868-037-1300, 'Peter Parker’, ‘Left East wing', 500, 0981);

INSERT INTO HALL VALUES('The Green Banquets', 'Middle wing' , 868-245-1323, 'Naruto', 'Middle wing', 500, 0982);

INSERT INTO HALL VALUES('The Azalea Hall', 'Left East wing' , 868-347-2303, 'Raiden Shogun', 'Right east wing', 500, 0983);

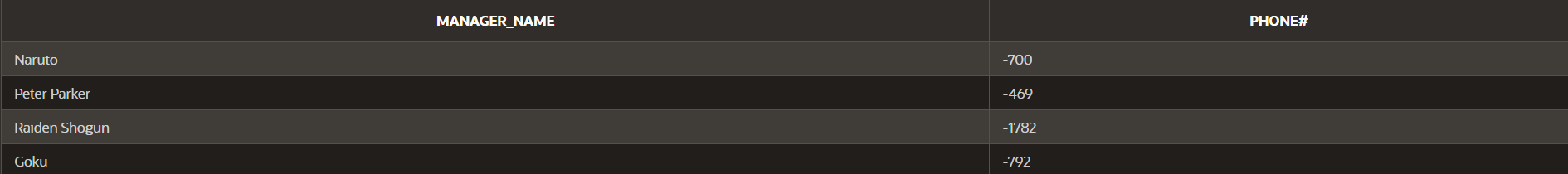
INSERT INTO HALL VALUES('Nightjar Banquets', 'Left East wing' , 868-567-1093, 'Goku', 'Left west wing', 500, 0984);



**Queries**

1. SELECT DISTINCT manager\_name, phone#

FROM HALL;



1. SELECT i.student#, i.fname, i.lname, o.lease#, o.commence\_date, o.end\_date, o.l\_length, o.room#

FROM LEASE o

INNER JOIN STUDENt i

ON o.student# = i.student#;

A screenshot of a computer

Description automatically generated with medium confidence

c. SELECT \*

FROM LEASE

WHERE(commence\_date > '07-01-2014' AND end\_date < '08-31-2014') OR (commence\_date > '07-01-2015' AND end\_date < '08-31-2015');

Text

Description automatically generated

d. SELECT \*

FROM INVOICE;

A screenshot of a computer

Description automatically generated with medium confidence

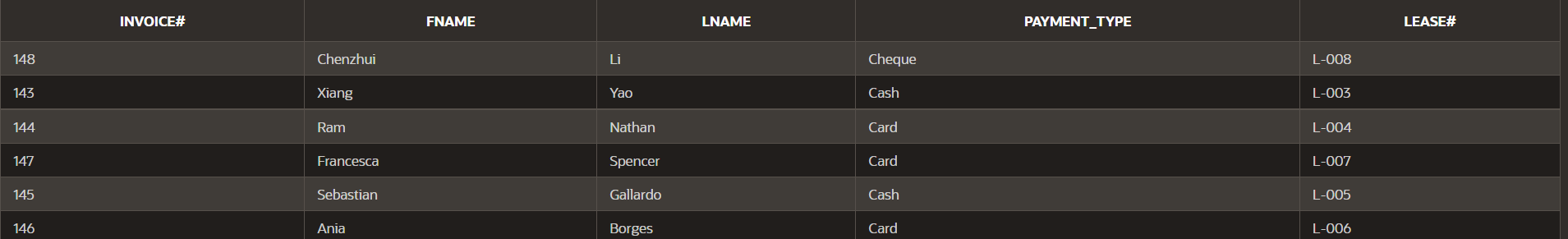
e. SELECT o.invoice#, r.fname, r.lname, o.payment\_type, o.lease#

FROM LEASE b

INNER JOIN STUDENT r on b.student# = r.student#

INNER JOIN INVOICE o on b.lease# = o.lease#

WHERE(payment\_date > '11-09-2014');



f. SELECT \*

FROM INSPECTION

WHERE remarks != 'Clean';A screenshot of a computer

Description automatically generated with medium confidence

1. SELECT COUNT(CASE WHEN s\_degree = 'BSc' then 1 ELSE NULL END) AS BSc,

COUNT(CASE WHEN s\_degree = 'BA' then 1 ELSE NULL END) AS BA,

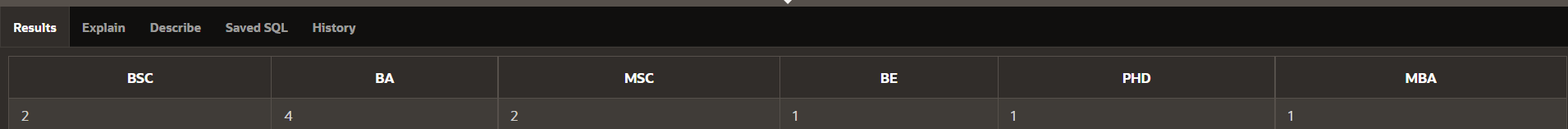
COUNT(CASE WHEN s\_degree = 'MSc' then 1 ELSE NULL END) AS MSc,

COUNT(CASE WHEN s\_degree = 'BE' then 1 ELSE NULL END) AS BE,

COUNT(CASE WHEN s\_degree = 'PhD' then 1 ELSE NULL END) AS PhD,

COUNT(CASE WHEN s\_degree = 'MBA' then 1 ELSE NULL END) AS MBA

FROM STUDENT;



j. SELECT p.student#, o.fname, o.lname

FROM STUDENT o

INNER JOIN GUARDIAN p ON o.student# = p.student#

WHERE p.student# IS NULL;

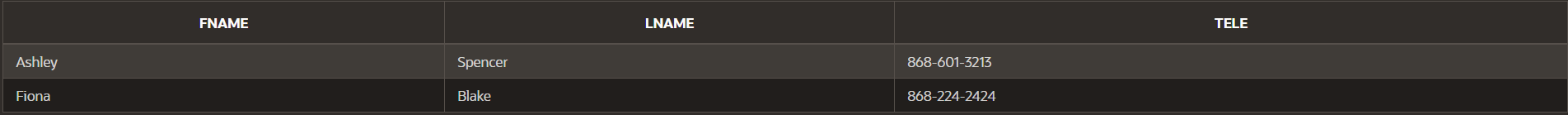
Text

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k. SELECT fname, lname, tele

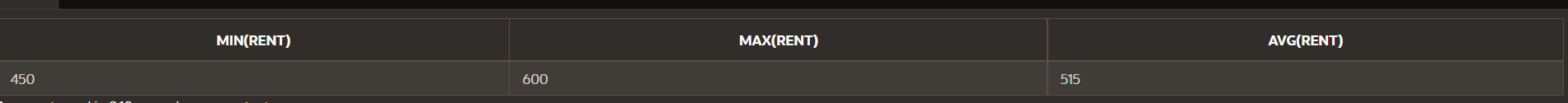
FROM ADVISER

WHERE(student# = 1000 OR student# = 1009);



l. SELECT MIN(rent), MAX(rent), AVG(rent)

FROM ROOM;

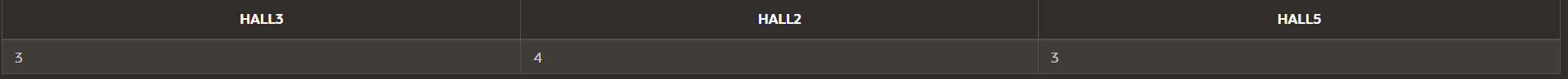


m. SELECT COUNT(CASE WHEN flat\_addr = '3, Mount Merrion' then 1 else NULL END) AS Hall3,

COUNT(CASE WHEN flat\_addr = '2, Mount Merrion' then 1 else NULL END) AS Hall2,

COUNT(CASE WHEN flat\_addr = '5, Mount Merrion' then 1 else NULL END) AS Hall5

FROM FLAT;



n. SELECT staff#, fname, lname, age, location

FROM STAFF

WHERE age > 60;

