Dormitory Accommodation Term Project

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**Introduction**

**Business Rules and Assumptions**

1. Students may rent a room in a residence hall or student apartment. Likewise, a room can be rented by Students or a student apartment.
2. Students are assigned to a member of staff. Likewise, members of staff are assigned by students.
3. Students are assigned advisors, likewise, advisors are assigned, students.
4. Students have a next-of-kin. Likewise, a next of kin has students.
5. Students are associated with courses. Likewise, courses are associated with students.
6. Students are sent an invoice. Likewise, an invoice is sent to students.
7. Students receive leases. Likewise, leases are received by students.
8. Student Apartments are inspected by inspectors. Likewise, inspectors inspect student apartments.
9. Halls can provide only single rooms. Likewise, single rooms are provided by halls.
10. The Resident Office provides student apartments. Likewise, student apartments are provided by the resident office.
11. The Resident Office has information on courses. Likewise, course information is held by the resident office.
12. Members of staff are stored by the Resident Office. Likewise, the resident office stores the members of staff.
13. Members of staff, store information about the instructors. Likewise, information about the instructors is stored by the members of staff.

**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

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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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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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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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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');

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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');

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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

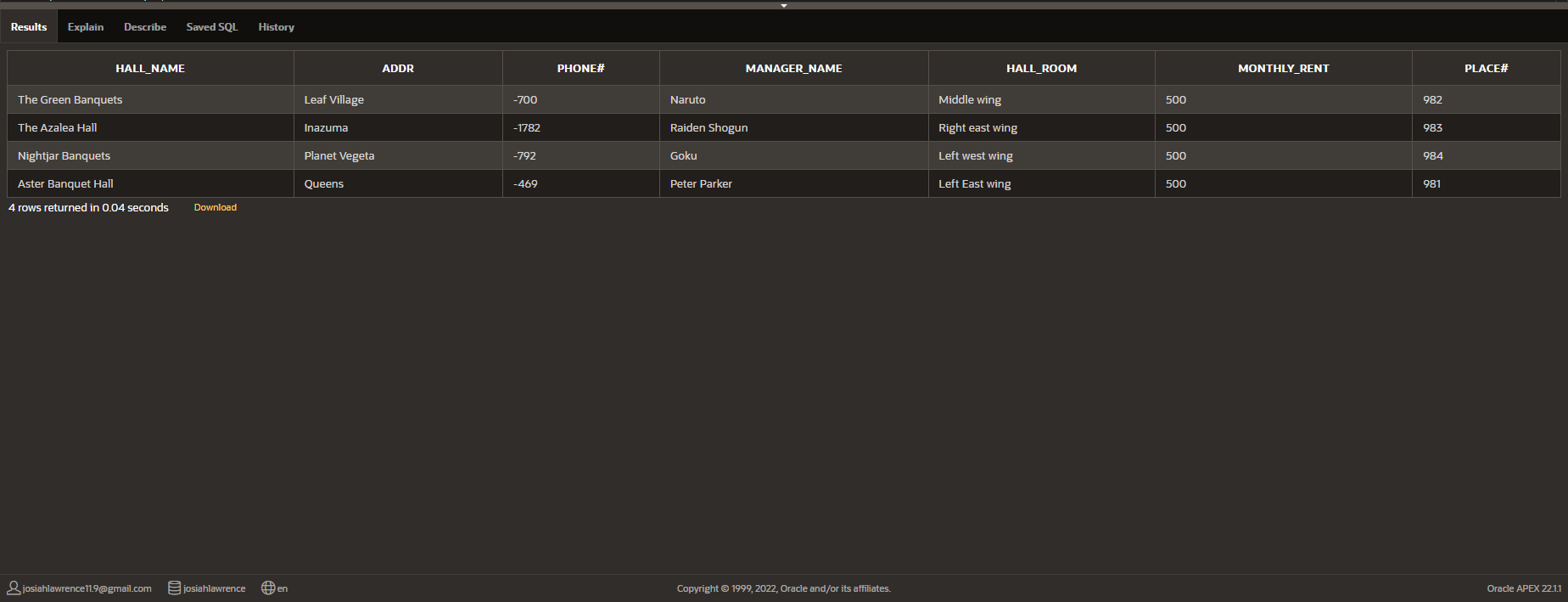
Description automatically generated with medium confidence

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);

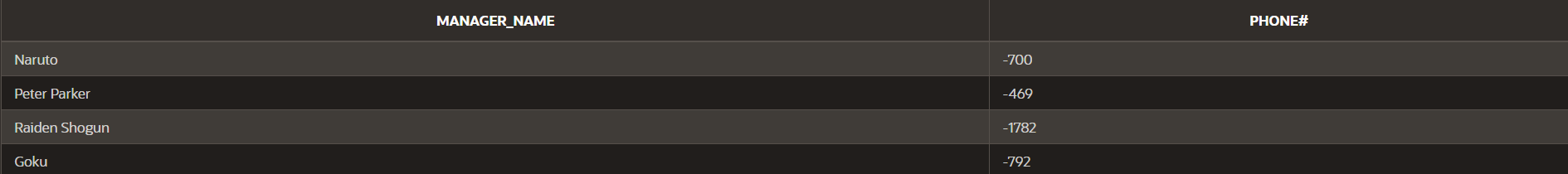
INSERT INTO HALL VALUES('Nightjar Banquets', 'Left East wing' , 868-567-1093, 'Goku', 'Left west wing', 500, 0984);



**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#;

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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

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d. SELECT \*

FROM INVOICE;

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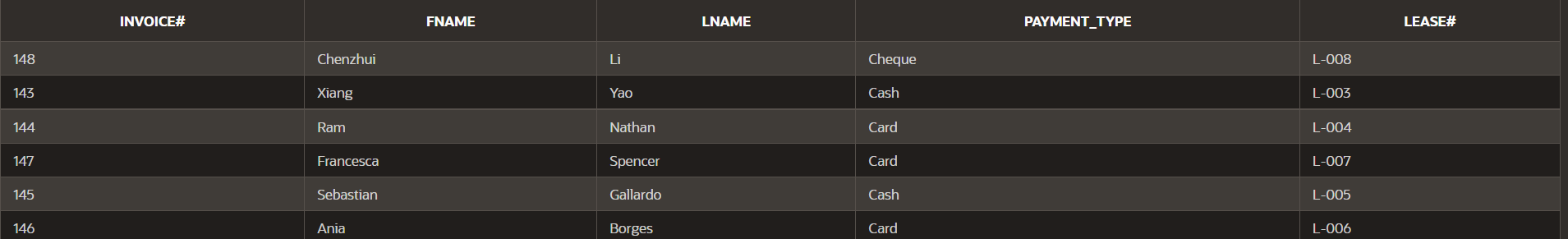
e. SELECT o.invoice#, r.fname, r.lname, o.payment\_type, o.lease#

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

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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,

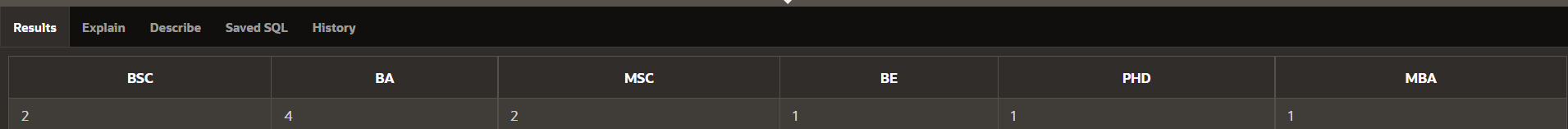
COUNT(CASE WHEN s\_degree = 'MSc' then 1 ELSE NULL END) AS MSc,

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;

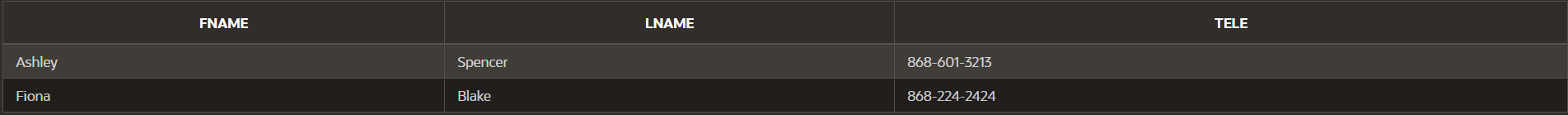
Text

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k. SELECT fname, lname, tele

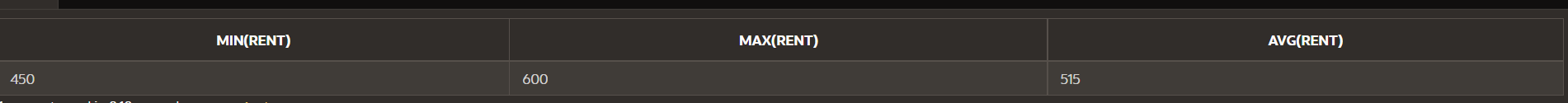
FROM ADVISER

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



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

FROM ROOM;

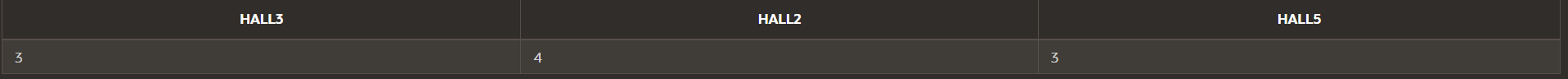


m. SELECT COUNT(CASE WHEN flat\_addr = '3, Mount Merrion' then 1 else NULL END) AS Hall3,

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;

