Advanced Databases

UNIDEN: A STUDENT ACCOMEDATION COMPANY

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I. Description:

Uniden is a student accommodation company that has recently been established in Dublin, Ireland. The company offers accommodation apartments in the southside of Dublin such as Sandyford and Stillorgan. An apartment building is identified by its name. It has many apartments which are identified by their number. Small apartments have a capacity of 2 students, medium – 4 students and large – 6 students.

When a student wishes to rent an apartment, they must provide their student ID, name, university they are attending, building name and apartment number they want to rent. Once the student information is complete, a contract will be drawn up which holds their student ID, start, end date of rent and the monthly rent. A student may rent a small apartment but may also rent a medium or large apartment depending on the availability. When a group of students want to rent an apartment together, they are applicable for a discount in rent. Each contract is only associated with one student. The monthly rent for small, medium and large apartments ranges from €1300 – €1500, €1500 – €2500 and €2500-€3000 respectively.

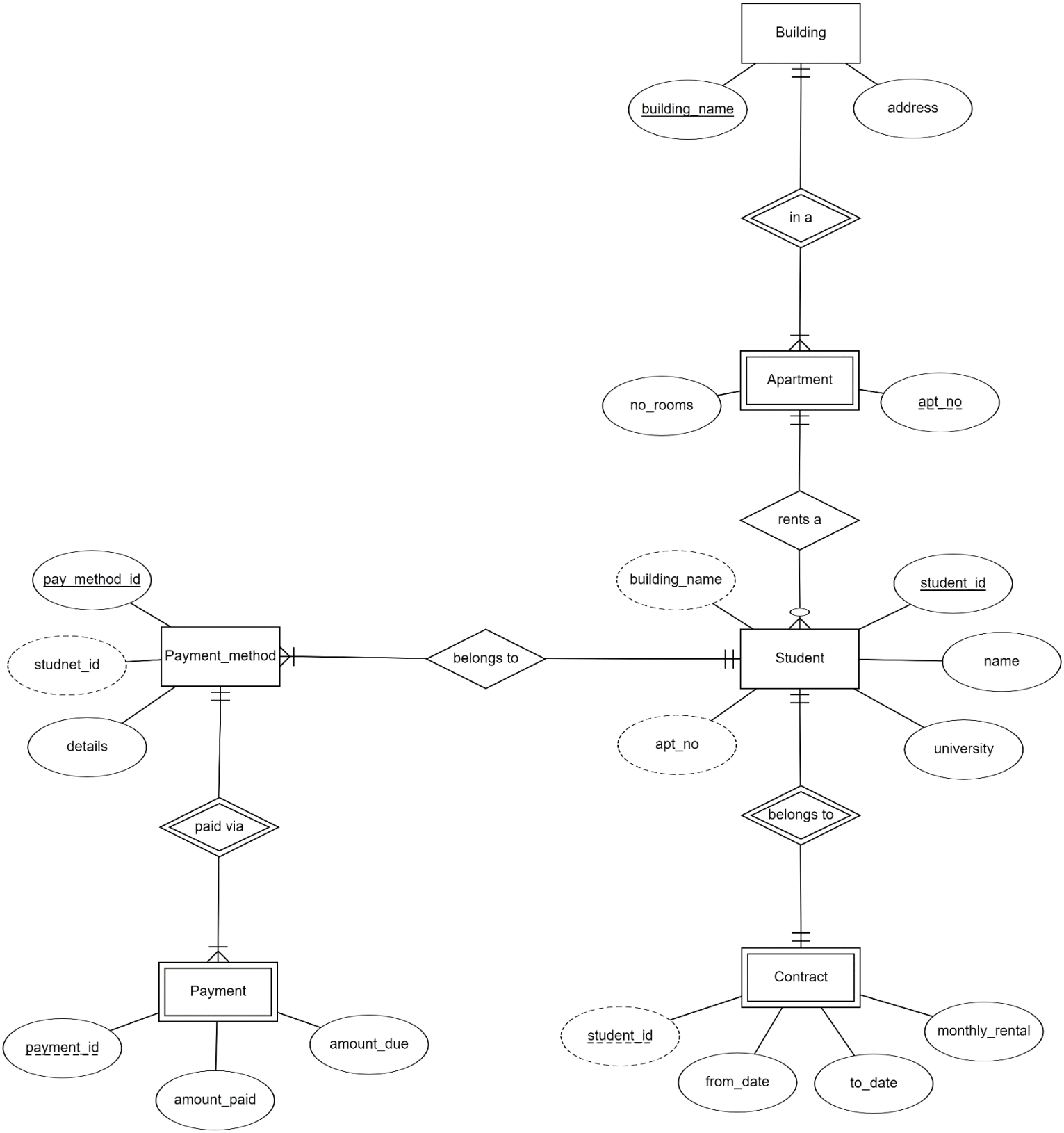
Students may have one or more payment methods which has an ID associated with it as well as details of that method. A payment method is only associated with one student; thus, two students cannot have the same payment method. The apartment keys are provided once a student has paid a one-month rent which is considered as a deposit. The monthly rent may be paid in installments. When a payment is made, the amount paid and the amount due are recorded. Payments are identified by their own ID as well as the payment method ID.

Students may choose to complete a form when they wish to start renting an apartment which is available on the Uniden website but can only be accessed with a special link. The form requires the following details: student ID, full name, university they are attending, building name, apartment number, start and end date and the monthly rent agreed upon. When the information is valid, the contract is drawn up and the student is registered as a tenant in the apartment. The building or apartment must exist for the student to rent it, otherwise the student is prompted with an error.

Other forms can only be accessed by the employees of Uniden. These forms include viewing and adding buildings, apartments, payment methods and payments. They can also view students and their information such as rent period, monthly rent etc. There is a main menu form which they can use to navigate through the other forms.

Three reports are also provided. The first report shows the number of students in each apartment, this helps in managing the apartment capacity. The second form shows each registered student and their monthly rent. The third report shows the payment method/s associated with each student.

II. Entity relationship diagram:



III. Relational model:

Building(building_name, address)

Apartment(apt_no, building_name, no_rooms)

Student(student_id, apt_no, building_name, name, university)

Contract(student_id, from_date, to_date, monthly_rental)

Payment method(pay_method_id, student_id, details)

Payment(payment_id, pay_method_id, amount_paid, amount_due)

Key:

Primary Key

Foreign Key

IV. SQL scripts:

SQL statements to create tables:

```
sql = "CREATE TABLE Building (building_name text PRIMARY KEY," + _
"address text)"

CurrentDb.Execute (sql)

sql = "CREATE TABLE Apartment(building_name text REFERENCES Building(building_name)," + _
"apt_no text," + _
"no_of_rooms int," + _
"PRIMARY KEY (building_name, apt_no))"
```

```
CurrentDb.Execute (sql)

sql = "CREATE TABLE Student(studentID text PRIMARY KEY," + _
"name text," + _
"university text," + _
"apt_no text," + _
"building_name text," + _
"FOREIGN KEY (building_name, apt_no) REFERENCES Apartment(building_name, apt_no))"

CurrentDb.Execute (sql)

sql = "CREATE TABLE Contract(studentID text REFERENCES Student(studentID)," + _
"from_date datetime," + _
"to_date datetime," + _
"monthly_rental int," + _
"PRIMARY KEY (studentID))"

CurrentDb.Execute (sql)


sql = "CREATE TABLE Payment_Mehtod(pay_method_id counter PRIMARY KEY," + _
"studentID text REFERENCES Student(studentID)," + _
"details text)"

CurrentDb.Execute (sql)
```

```
sql = "CREATE TABLE Payment(paymentID counter," + _

"pay_method_id long REFERENCES Payment_Mehtod(pay_method_id)," + _

"amount_paid currency," + _

"amount_due currency," + _

"PRIMARY KEY(paymentID, pay_method_id))"


CurrentDb.Execute (sql)
```

SQL statements to insert data into table:

```
CurrentDb.Execute ("INSERT INTO Building VALUES('The Gates', 'Blackthorn Road, Sandyford, Dublin')")

CurrentDb.Execute ("INSERT INTO Building VALUES('The Edges', 'Blackthorn Road, Sandyford, Dublin')")

CurrentDb.Execute ("INSERT INTO Building VALUES('Vantage 7', 'Central Park, Leopardstown Rd, Tipperstown, Dublin 18')")

CurrentDb.Execute ("INSERT INTO Apartment VALUES('The Gates', '101', 2)")

CurrentDb.Execute ("INSERT INTO Apartment VALUES('The Edges', '304', 4)")

CurrentDb.Execute ("INSERT INTO Apartment VALUES('Vantage 7', '616', 6)")

CurrentDb.Execute ("INSERT INTO Student VALUES('C17500926', 'Adam Murphy', 'TUD', '101', 'The Gates')")

CurrentDb.Execute ("INSERT INTO Student VALUES('D18126895', 'Michael Halpert', 'DCU', '304', 'The Edges')")

CurrentDb.Execute ("INSERT INTO Student VALUES('16269745', 'Susan Goldenberg', 'UCD', '616', 'Vantage 7')")

CurrentDb.Execute ("INSERT INTO Contract VALUES('C17500926', '14/2/2019', '14/2/2020', 1300)")
```

```
CurrentDb.Execute ("INSERT INTO Contract VALUES('D18126895', '10/1/2019', '9/1/2020', 2300)")

CurrentDb.Execute ("INSERT INTO Contract VALUES('16269745', '14/4/2019', '14/10/2019',
2600)")

CurrentDb.Execute ("INSERT INTO Payment_Mehtod VALUES('1', 'C17500926', 'debit card:
102486215645')")

CurrentDb.Execute ("INSERT INTO Payment_Mehtod VALUES('2', 'C17500926', 'debit card:
123496258976')")

CurrentDb.Execute ("INSERT INTO Payment_Mehtod VALUES('3', 'D18126895', 'debit card:
369752489654')")

CurrentDb.Execute ("INSERT INTO Payment_Mehtod VALUES('4', '16269745', 'debit card:
469759743697')")

CurrentDb.Execute ("INSERT INTO Payment VALUES('1', '1', 1300, 1300)")

CurrentDb.Execute ("INSERT INTO Payment VALUES('2', '3', 2000, 2600)")

CurrentDb.Execute ("INSERT INTO Payment VALUES('3', '2', 1000, 300)")

CurrentDb.Execute ("INSERT INTO Payment VALUES('4', '4', 2600, 2600)")
```