

1. One output of the database is a list ordered by apartment number of all the tenants and their contact information.

$Q1 \leftarrow \pi_{\text{APARTMENT.ApartmentNo, TENANT.Fname, TENANT.LName, TENANT.PhoneNumber, TENTANT.Email}} (\text{TENANT} \bowtie_{\text{TENANT.LeaseID=LEASE.LeaseID}} \text{LEASE} \bowtie_{\text{LEASE.ApartmentID=APARTMENT.ApartmentNo}} \text{APARTMENT})$

2. The database will allow the owners to track tenant payments and show a list of whose rent is late along with the term of the lease and how to contact the tenant to find out what's up.

$Q2 \leftarrow \pi_{\text{LEASE.LeaseID, LEASE.Term, TENANT.Fname, TENANT.LName, TENANT.PhoneNumber, TENANT.Email, PAYMENT.DueDate, PAYMENT.PaidDate, PAYMENT.Amount}} (\sigma_{\text{PAYMENT.DueDate < PAYMENT.PaidDate}} (\text{TENANT} *_{\text{TENANT.LeaseID=LEASE.LeaseID}} \text{LEASE} *_{\text{LEASE.LeaseID=PAYMENT.LeaseID}} \text{PAYMENT}))$

3. They will also have a list of leases expiring in the next 3 months so that they can offer the tenant an extension or determine if they are moving out and know on what day the apartment will be vacant. The list should show if the tenant is also going to release a garage or a storage area that they pay extra for

$Q3 \leftarrow \pi_{\text{LEASE.LeaseID, TENANT.Fname, TENANT.LName, TENANT.PhoneNumnber, LEASE.StartDate, LEASE.ExpirationDate, AMENITY.AmenityName}} (\sigma_{\text{LEASE.ExpirationDate < Today() + 90 days AND AMENITY.FlagType = 'Rental'}} (\text{LEASE} *_{\text{LEASE.LeaseID=TENANT.LeaseID}} \text{TENANT} *_{\text{TENANT.TenantID=AMENITY\_USED.TenantID}} \text{AMENITY\_USED} *_{\text{AMENITY\_USED.AmenityID=AMENITIES.AmenityID}} \text{AMENITIES}))$

4. At the end of each month, they want to know how much they made from their extra services and supplies. They like to see 12 months back and total things by sales and loans

$Q4 \text{ "Type", "Year", "Month", "Total Profit"} \leftarrow \text{AMENITY.FlagType, YEAR(AMENITY\_USED.StartDate), MONTH(AMENITY\_USED.StartDate)} \bowtie \text{SUM(AMENITY.Price*(COALESCE(AMENITY\_USED.ReturnDate - AMENITY\_USED.StartDate, 1))) } (\sigma_{\text{AMENITY\_USED.StartDate = '%Y-%m-01' - 365 days AND (AMENITY.FlagType = "Loan" OR AMENITY.FlagType = "Sale")}} (\text{AMENITY\_USED} *_{\text{AMENITY\_USED.AmenityID = AMENITIES.AmenityID}} \text{AMENITIES}))$

5. There is an ongoing list of projects grouped by maintenance types (for example, carpentry, plumbing, mechanical and appliance repair, and pest control). Within each group we can see the date requested, date scheduled, date completed for each project.

$Q5 \leftarrow \pi_{\text{MAINTENANCE\_JOB.Category, MAINTENANCE\_JOB.DateRequested, MAINTENANCE\_JOB.DateScheduled, MAINTENANCE\_JOB.DateCompleted}} (\text{MAINTENANCE\_JOB})$

6. Quarterly, there is a report that shows job categories, the number of projects completed, the percentage of all projects requested in the quarter that are completed and the average time of completion in hours for a project in that category

$Q6 \text{ "Job Category", "Number of projects completed", "Percentage of projects completed from requests", "Average time of completion", "Quarter"} \leftarrow \pi_{\text{MAINTENANCE\_JOB.Category, CompletedProjects, PercentageComplete, AverageTime, MAINTENANCE\_JOB.Category}} (\text{MAINTENANCE\_JOB.Category, MAINTENANCE\_JOB.Quarter} \bowtie \text{COUNT(MAINTENANCE\_JOB.DateCompleted) AS CompletedProjects, (COUNT(MAINTENANCE\_JOB.DateCompleted)/$

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COUNT(MAINTENANCE_JOB.DateRequested)*100) AS PercentageComplete , AVG(MAINTENANCE_JOB.CompletionTime) as  
AverageTime (MAINTENANCE_JOB))
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