

### Assignment 3: Class Diagrams (20 points)

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**Assignment:** Consider the following scenario then complete the exercises below:

Murphy resorts is the business of leasing apartments in the DFW metroplex. They are in the process of launching a web portal to manage customer leases, rental payments, maintenance, etc. The following requirements need to be met:

- 1) Customers will be able to search for apartments available to rent (based on criteria like number of bedrooms and bathrooms), view the pricing, setup a tour request and apply for leasing an apartment. Customers will be able to rent apartments on a month-to-month contract, bi-annual or annual contract, subject to the discretion of the management. The rental price will vary depending on the type of contract and other special offers.
- 2) Once the application to lease an apartment is received, the management will review the applicant's criminal history, driving violations, employment verification and credit history.
- 3) If an application goes through the review, the apartment lease is approved and an invitation is sent to the customer by email to register for an account with Murphy Resorts. The user will be allowed to register into the system by providing the user ID they would like to login with, password they would like to set, email address, current address, emergency contact person and their address, employer's address and contact information. Upon successful completion of the registration process, the user is immediately presented with a contract showing all the details about the leasing, and the terms and conditions. Customers will be able to sign the contract using the system itself and no manual/paper process will be needed. They will also have to provide a credit card on record at the time of registration which will be used to setup auto-payment to process the rent, with the approval of the customer.
- 4) Applicants will be requested to deposit a security fee that is equal to a month's rental fee. This will be refunded when the customer's lease ends and they leave the property in a clean and repair-free state. If there are cleaning and repairs to be done, the charges will be deducted from the deposit and the balance will be refunded to the customer. If the customer has to incur charges that exceeds the deposit amount, the customer's credit card will be automatically charged. This is the only time the customer's card will be charged, even if they have opted out of auto-payment. The contract will have a clause that clearly captures the customer's acceptance to this condition.
- 5) The system will auto-process rental charges for those customers that opted for auto-payment on the 10<sup>th</sup> of every month. If customers opted out of auto-payment, the system will generate an email reminder on 1<sup>st</sup> of each month, informing the customers that the rent is due for the month. Customers can pay with their credit card, use an alternate credit card, or pay via paypal before the 10<sup>th</sup> of the month.
- 6) The system will show the transaction history to the customer if customers want to print or view the rental receipts from the past.
- 7) Customers can request preferred parking permits and an additional charge of \$50 per month will be applied for those with such permits when the rent is collected.

Permits can only be requested at the time of lease and cannot be canceled until the lease ends or gets renewed.

- 8) Customers can request for repair services using the portal and the system should be able to process these requests. Repair services can be provided only when the customer is at home, unless there is an emergency like fire or flood. In such cases, no authorization will be needed for the repair personnel to enter the house. This will be included in the contract terms and conditions and customers must sign this clause.
- 9) System will send a notification to customers 2 month before the lease end. In case the customer applies to extend the lease, the system will recalculate the rent based on the rental history and the current offers. This decision should be conveyed with a month after receiving the notification.
- 10) Administrators should be able to update customer information and send newsletters/ emails to customers on file.

### ***Exercises:***

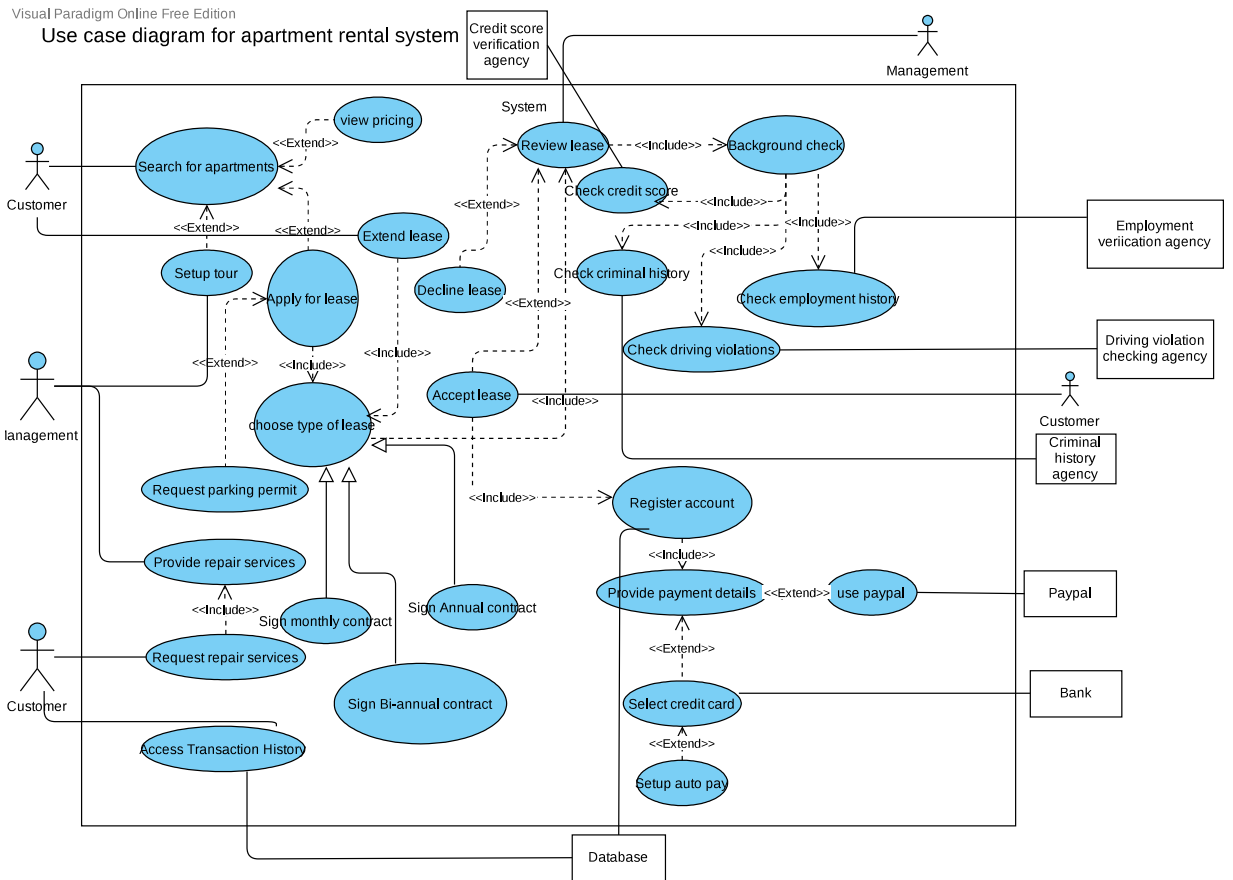
1. Develop a ***Use Case diagram*** for the scenario covering all major and important supporting use cases from the above case. No hand drawings please. (15 points)
  - a. User cases should be features of the system and the name should indicate an action or feature. For example, “Transaction” is a thing. It is an entity and not an action. Infact, “Transaction” is an outcome of some action. You should state it as “Perform Transaction” or “Record Transaction” clearly indicating the meaning of the use case. When someone sees your use case diagram, they should clearly understand what you are referring to. Use case names should be a verb and indicate a feature of the system or an action it performs when invoked.
  - b. You should identify all major use cases for this case and try to create other use cases as relevant (supporting use cases). Use cases should be linked using “extends and includes” where applicable. Remember, this is not a flow chart.
  - c. Where can I go wrong? – Wrong names for use cases, wrong use of extends and includes, incorrect notations used, use cases not linked to an actor or another use case and sticking alone in the diagram, not performing exhaustive analysis to cover other supporting use cases, not marking actors properly, using includes/ extends between an actor and a use case, etc.
2. Create **two *Use Case Descriptions*** for any two major use cases from your use case diagram. The use case description should include the use case name, actor, brief description, normal flow of events, and exception flow of events. (20 points)
  - a. **Remember: Each use case in a use case diagram should have a corresponding use case description written specifically for that use case. You can choose any two use cases and write the description for them. You cannot combine the description for multiple use cases in one template. For each use case, you must write the description separately. Below is the template for use case description.**

Use Case Name:	required
Primary Actor:	required
Brief Description:	required
Stakeholders:	<i>optional</i>
Trigger:	<i>optional</i>
Normal flow of events:	required (be sure to be very specific, list each step in detail)
Subflows:	<i>optional</i>
Alternate/Exception flow:	required (be sure to be very specific, list each step in detail)

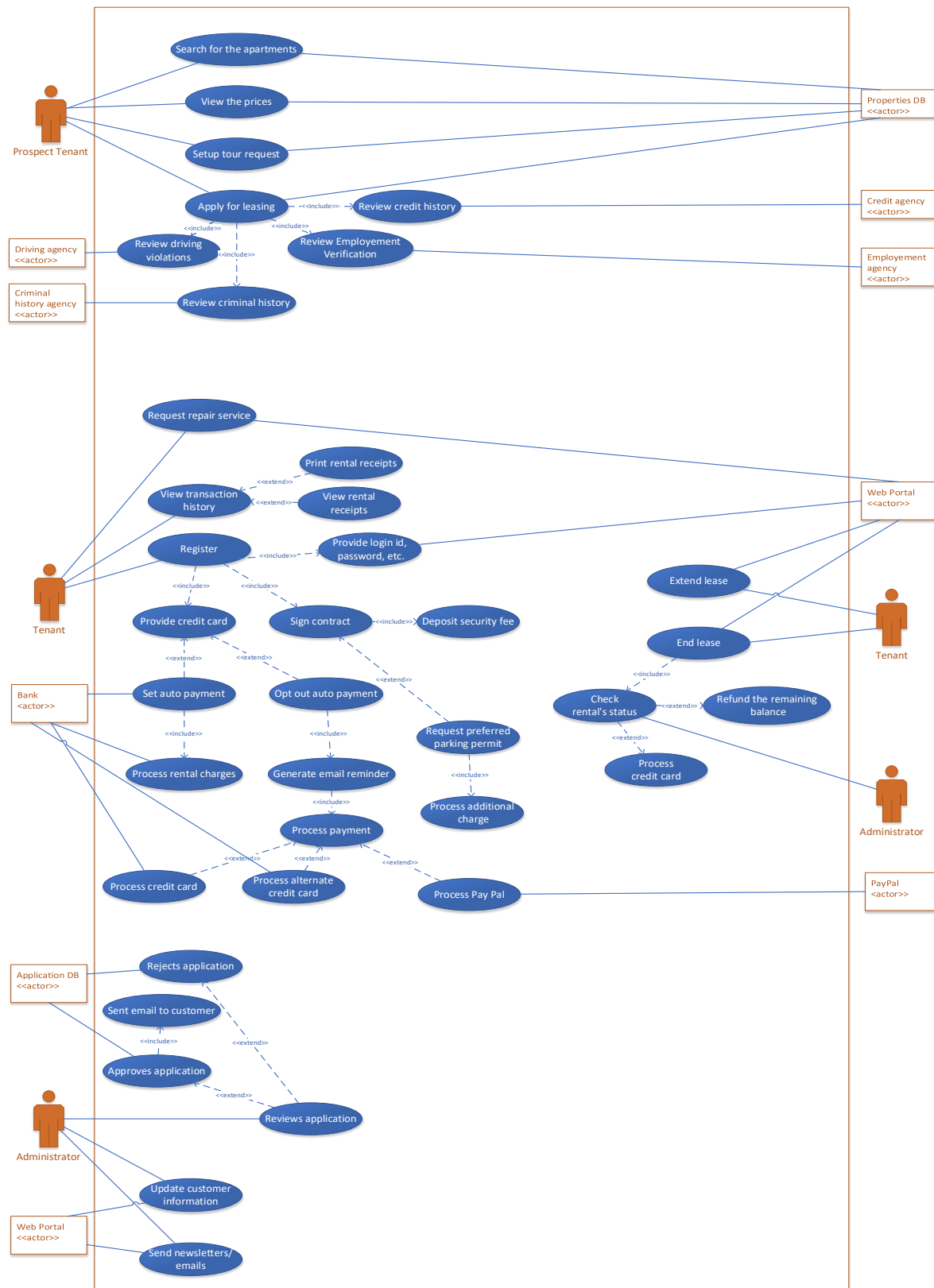
**Note:**

1. Submit your completed assignment as an attachment (.doc, .docx, or .pdf) via eLearning.
2. No hand drawings please. You must generate the UML diagrams using a tool and it should be done professionally.
3. Verify if the assignment looks good and the images are clear enough after your submission. If the submission is not of acceptable quality no third attempt will be given.

I am providing two possible solutions.  
Solution #1



Q1

**Solution 2:**

Q2.

Use Case Name:	Register
Primary Actor:	Tenant
Brief Description:	Tenant registers to Web portal.
Stakeholders:	Tenant, Web portal
Trigger:	After the application for the lease is accepted, the tenant registers to portal
Normal flow of events:	<ol style="list-style-type: none"><li>1. Tenant registers to account.</li><li>2. Tenant provides login id, password, email address, current address, emergency contact person and his/her address, employer's address and contact information.</li><li>3. System asks for credit card information.</li><li>4. Tenant provides credit card information.</li><li>5. System checks credit card.</li><li>6. The system shows the contract.</li><li>7. Tenant signs the contract.</li><li>8. After providing credit card information tenant can set up auto payment or opt out auto payment. If tenant does not prefer auto payment, system sends email to remind him/her lease payment on the first day of every month.</li><li>9. If Tenant opts out autopayment, he/she can pay buy using the current credit card in the system, another credit card, or Pay Pal.</li><li>10. System asks to pay the deposit security fee.</li><li>11. Tenant pays deposit security fee.</li><li>12. Tenant may request a preferred parking permit.</li><li>13. If tenant wants parking permit, system charges additional fee.</li></ol>
Subflows:	<i>optional</i>
Alternate/Exception flow:	<p>If the credit card information that tenants give during registration is not valid these steps are followed.</p> <ol style="list-style-type: none"><li>1. The system asks for another card information.</li><li>2. If the new card is valid, the customer continues the process and signs the contract.</li><li>3. If tenant cannot provide a valid credit card information, the leasing process ends, tenant cannot sign the contract.</li></ol>

Use Case Name:	End Lease
Primary Actor:	Tenant
Brief Description:	Tenant ends the current lease
Stakeholders:	Tenant, Administrator
Trigger:	<i>optional</i>
Normal flow of events:	<ol style="list-style-type: none"> <li>1. Tenant wants to end the lease.</li> <li>2. By using the system tenant sends the request to end the lease.</li> <li>3. The request comes to the Administrator.</li> <li>4. Administrator checks the rental's status.</li> <li>5. If the rental needs repairs, the system charges the amount from security fee. If the amount for repair is less than the security fee, system refunds the remaining balance. If the amount for repair is more than the security fee, the excess amount is charged from the tenant's credit card.</li> <li>6. The lease ends.</li> </ol>
Subflows:	<i>optional</i>
Alternate/Exception flow:	If the repair money cannot be charged from the credit card, tenant is asked to provide another credit card information.