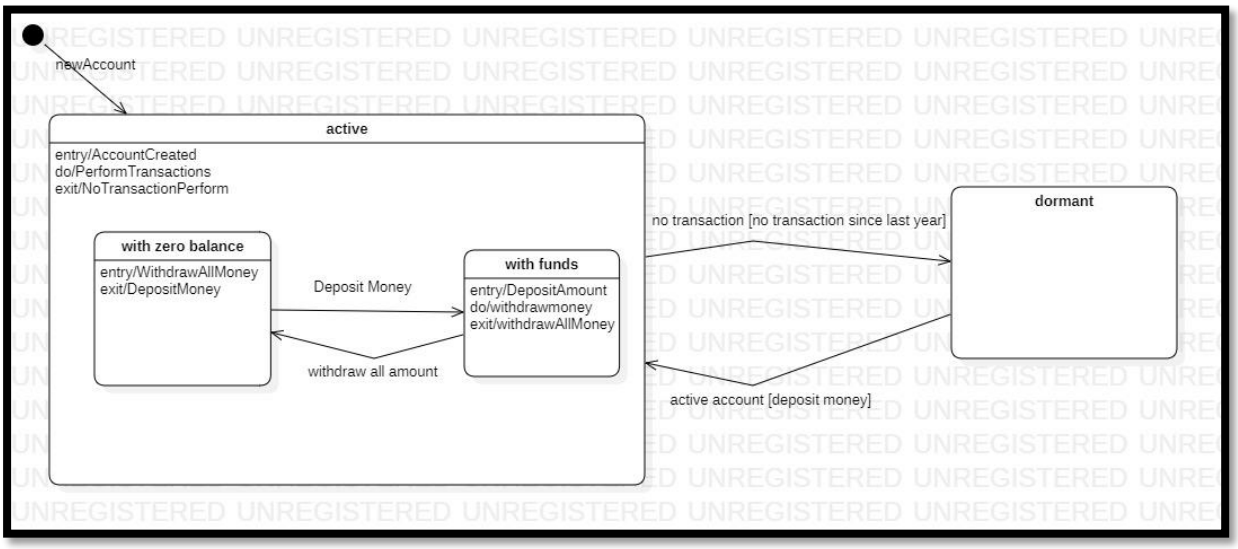
Saad Ali Hafiz
18B-025-SE-A

LAB: 05

EXERCISES 1

Consider the bank account system where a bank account in either is Active or Dormant (inactive). If it is active, it could be either with zero balance or with some funds. Create State Machine Diagram of the above banking system, mention all events and possible guards. Also include appropriate Entry, Do and Exit activities. Save the model and Attach printout for the Final State transition Diagram



EXERCISES 2

1. Create a state transition diagram for the Course Offering class (developed in previous laboratory session). Create the following states: Initialization, Open, Closed, Canceled.

2. Open the state transition diagram for the CourseOffering class. Create the state transitions as shown in the tables below.

From State	To State	Event Name
Initialized	Open	Add student
Open	Open	Add student
Open	Closed	None
Open	Canceled	Cancel course
Closed	Canceled	Cancel course

From State	To State	Action
Initialized	Open	set count = 0
Open	Open	None
Open	Closed	None
Open	Canceled	None
Closed	Canceled	None

From State	To State	Guard
Initialized	Open	None
Open	Open	count < 25
Open	Closed	count = 25
Open	Canceled	None
Closed	Canceled	None

3. Open the state transition diagram for the CourseOffering class

- Add a start state with a transition to the Initialization state to the diagram.
- Add a transition from the Canceled state to a stop state to the diagram.
- Add a transition from the Closed state to a stop state to the diagram.

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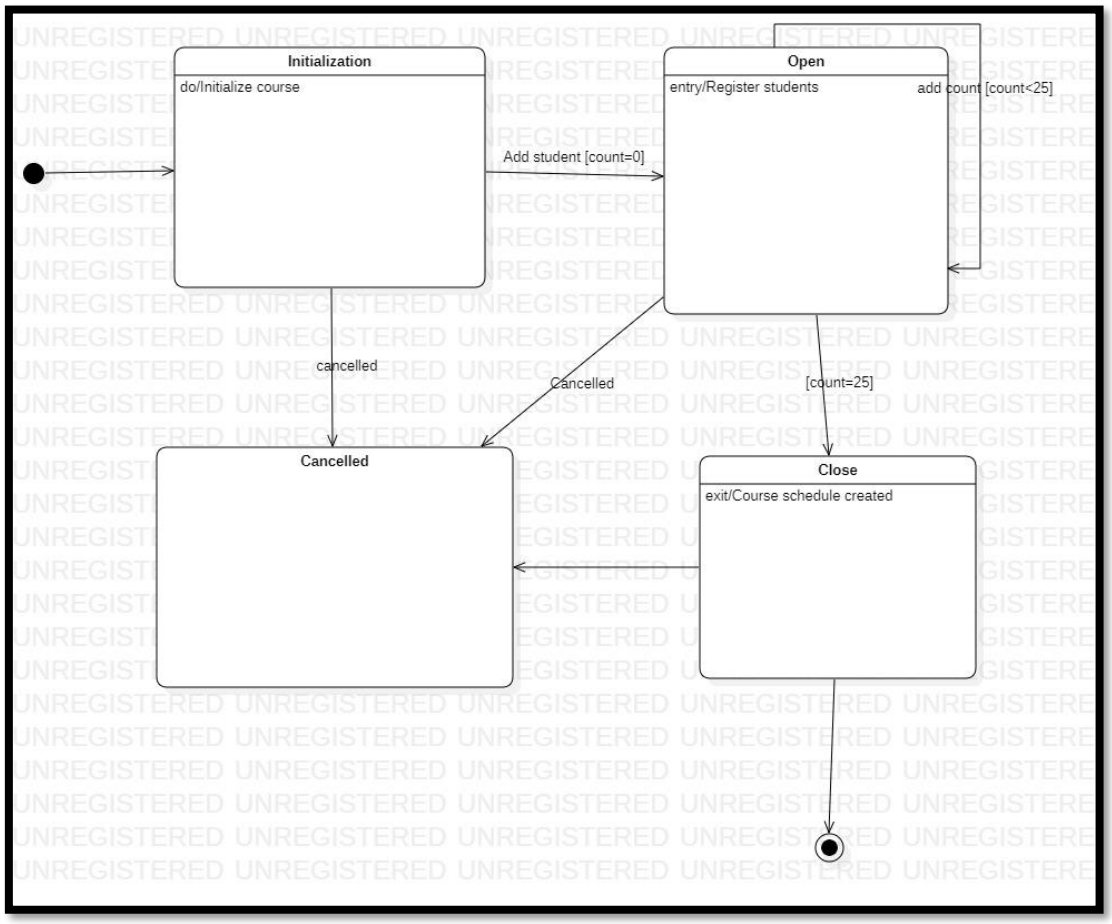

Save the model and Attach printout for the Final State transition Diagram

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Consider the Scenario of Payroll Application

- The manager first login and the system check the required credential provide by the manager.
- It authenticates and if it is successful, it moves to the next state where the manager can add employee.
- If the authenticate fails, it moves to a state where it again ask to reenter the credentials.
- The manager can add employee and move to record deletion state or the report generation state or payment calculation state.
- For payment calculation, the manger gives the requirements and system calculates the payments.
- The report generation state generate report for manager which is followed by updating state where all the records of an employee is updated
- The payment calculation state goes to error recovery state in case of error. after deletion of record state or updating of record state, the system ends the operation.

States detail are as below.

Idle: when no operation is performing in the system.

Admin Login: The manager logs and the system

Retry login: if login fail, this state gives chance to retry login again **Adding**

employee: this state add employee and their detail.

Adding new record: creates new employee.

Deleting record: Delete records of employee

Report Generation: Generate reports

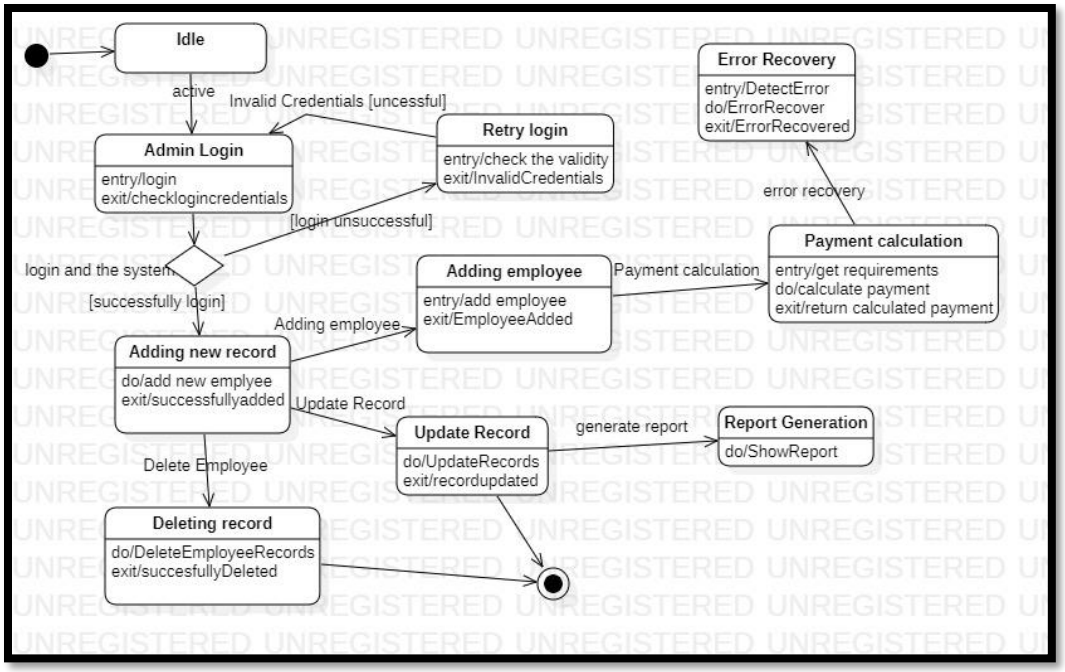
Payment calculation: Calculate payment of employee

Error Recovery: If error occurs, this state helps to recover that state **Update**

Record: Updates records of an employee.

Create State Machine Diagram of the above Payroll Application, mention all events and possible guards. Also include appropriate Entry, Do and Exit activities.

Save the model and Attach printout for the Final State transition Diagram



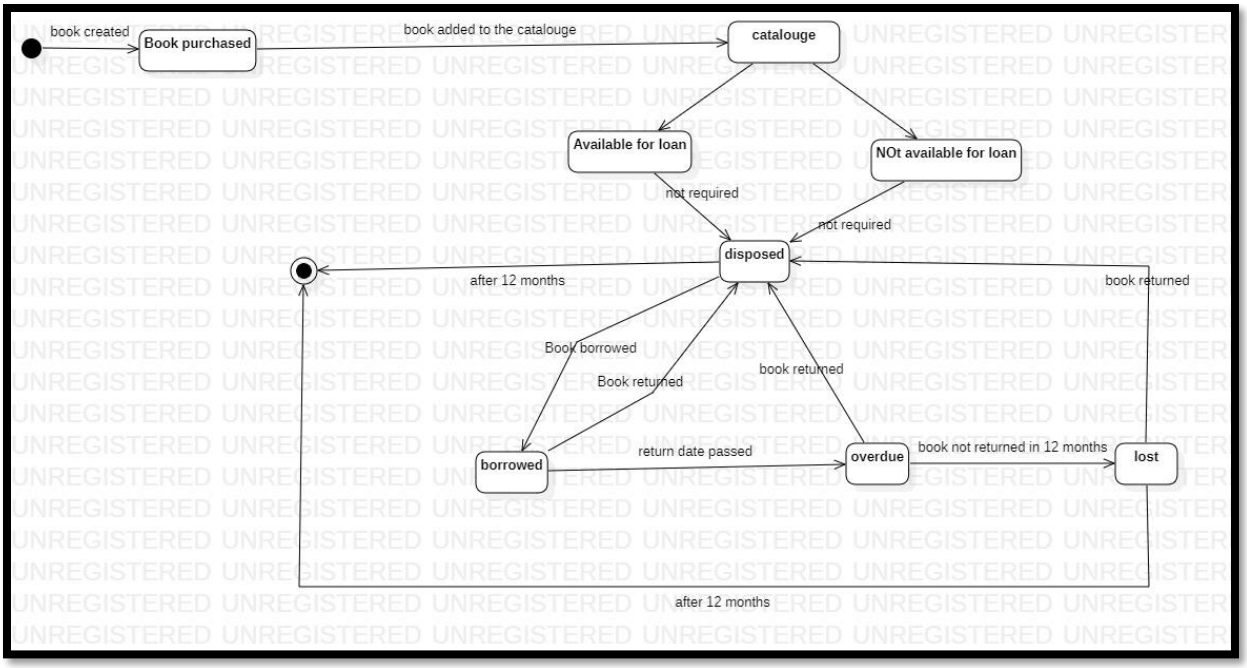
Students Task

Librarians categories the library books into loanable and non-loanable books. The non-loanable books are the reference books. However, the loanable books are the no reference books. After cataloguing the books, the books are available for loan. Students who borrow the library books should return them back before the due date. Books that are 12 months over the due date would be considered as a lost state. However, if those books are found in the future, they must be returned back to the library. When the books are found not required in the library or have been damaged, the book would be disposed.

You can consider following states for your diagram:

Purchased, Catalogued, Not available for loan, Available for loan, Disposed, Borrowed, Overdue, Lost

Create a State Machine diagram for an object of Book class. The following scenario provides about life cycle of a book for a library system:


book created
Book purchased
book added to the catalouge
catalouge
Available for loan
NOt available for loan
not required
not required
disposed
after 12 months
book returned
Book borrowed
Book returned
book returned
borrowed
return date passed
overdue
book not returned in 12 months
lost
after 12 months