# STATE TRANSITION TESTING
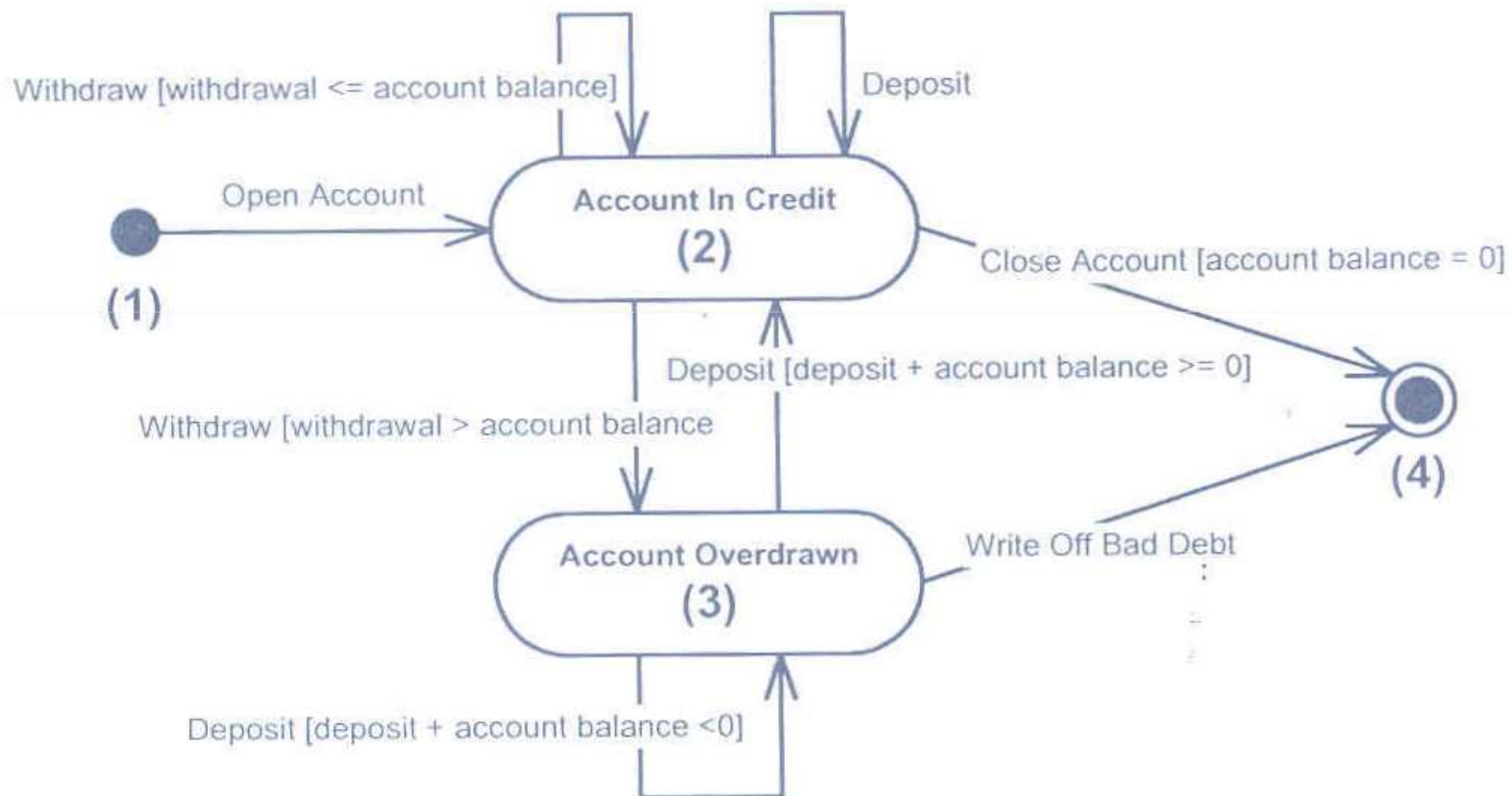
**Reference: Software Testing Course**

**@ Lonsdale System**

# State Transition for a Bank Account

HCMUNS – FIT – SE Dept - ST Course

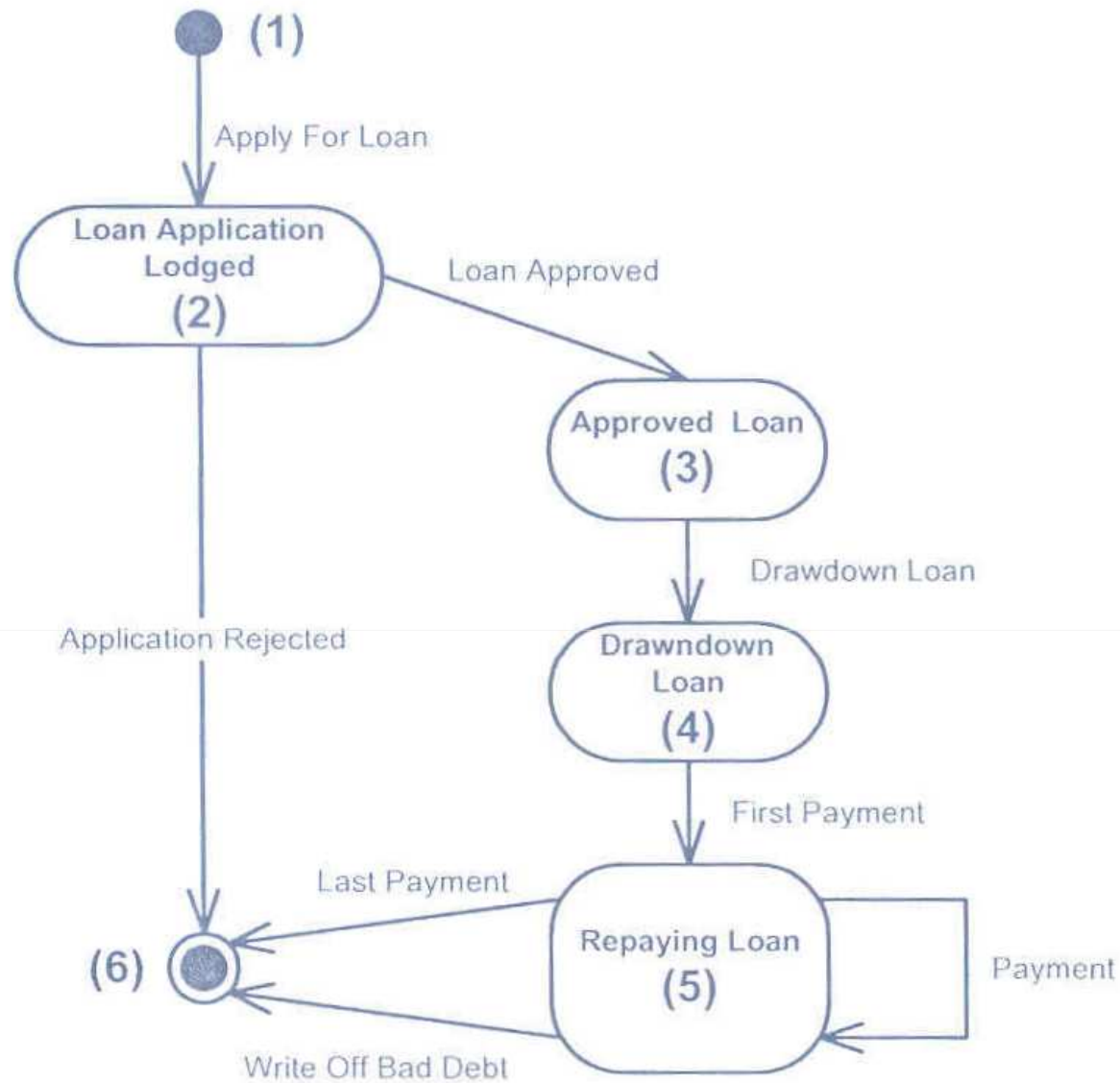| Prior State | New State | Valid Transition | Comment |
|---|---|---|---|
| 1 | 1 | N | |
| 1 | 2 | Y | New account |
| 1 | 3 | N | Possible negative test case |
| 1 | 4 | N | |
| 2 | 1 | N | |
| 2 | 2 | Y | Deposit and withdraw [withdrawal <= account balance] |
| 2 | 3 | Y | Withdraw [withdrawal > account balance] |
| 2 | 4 | Y | Closed account [account balance=0] |
| 3 | 1 | N | |
| 3 | 2 | Y | Deposit [deposit + account balance >= 0] |
| 3 | 3 | Y | Deposit [deposit + account balance < 0 ] |
| 3 | 4 | Y | Write Off Bad Debt [account balance < 0] |
| 4 | 1 | N | |
| 4 | 2 | N | Possible negative test case |
| 4 | 3 | N | Possible negative test case |
| 4 | 4 | N | Possible negative test case |

Table 1: State Table for a Bank Account

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Figure 4: State transition diagram for a Bank Loan

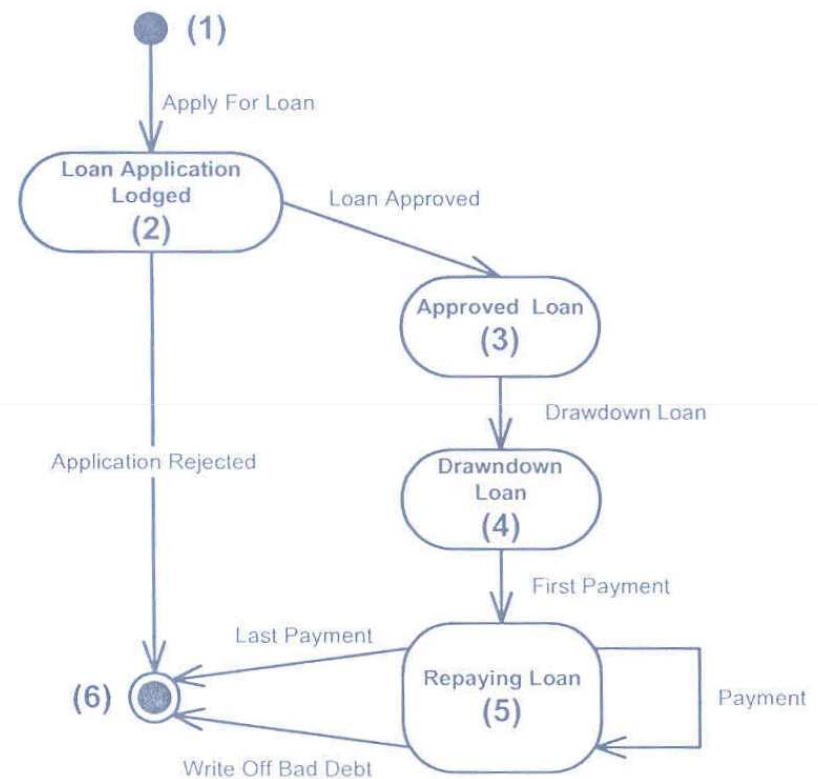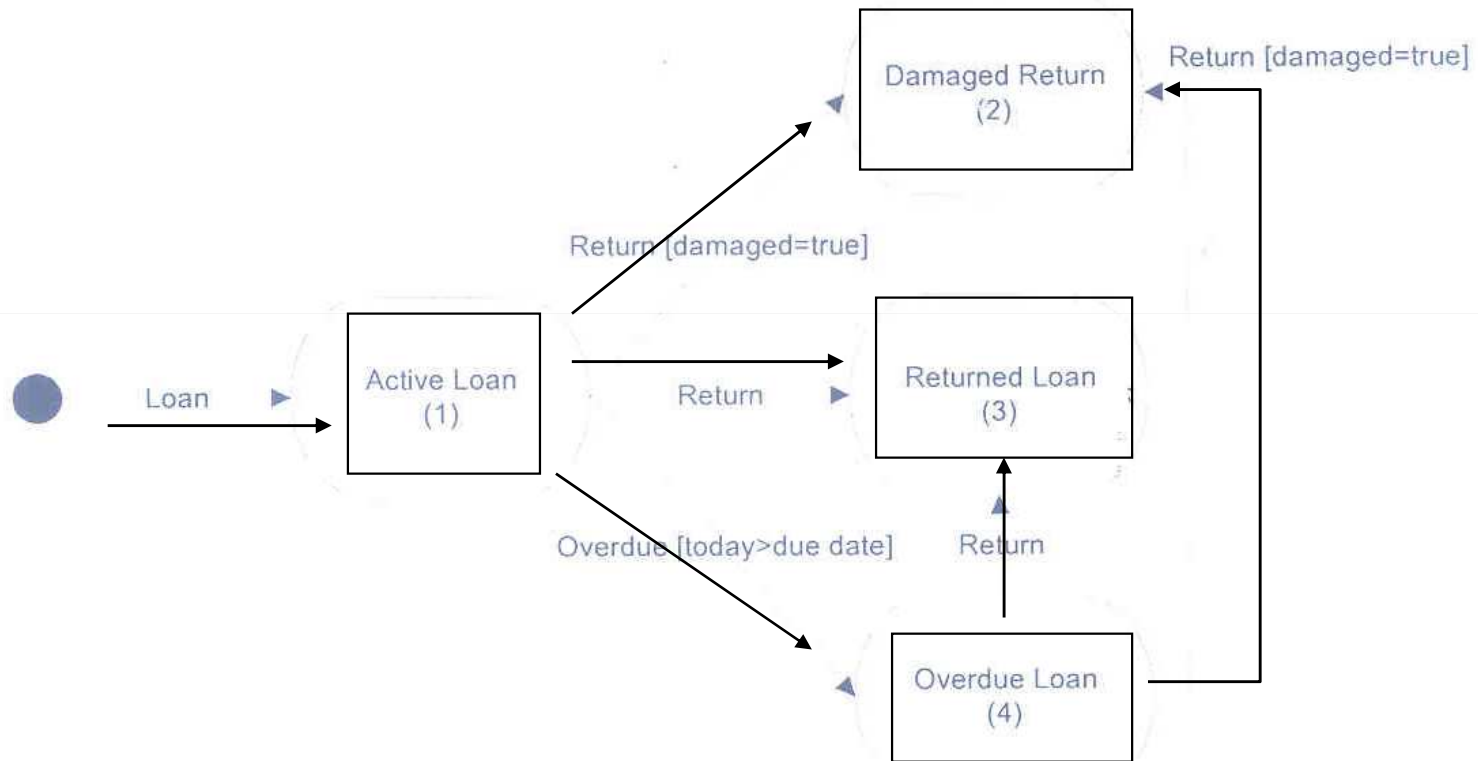| Prior State | New State | Valid Transition | Comment |
|---|---|---|---|
| 1 | 1 | N | |
| 1 | 2 | Y | New loan application |
| 1 | 3 | N | |
| 1 | 4 | N | |
| 1 | 5 | N | |
| 1 | 6 | N | |
| 2 | 1 | N | |
| 2 | 2 | N | |
| 2 | 3 | Y | Loan approval |
| 2 | 4 | N | This tests that un-approved loans cannot be drawn down |
| 2 | 5 | ? | Is there an application fee? |
| 2 | 6 | Y | Loan rejection |
| 3 | 1 | N | |
| 3 | 2 | ? | Can approved loans be reconsidered? |
| 3 | 3 | N | |
| 3 | 4 | Y | Drawdown of loan |
| 3 | 5 | ? | Can pre-payments be accepted? |
| 3 | 6 | N | |
| 4 | 1 | N | |
| 4 | 2 | ? | Can a drawdown loan be reconsidered? |
| 4 | 3 | N | |
| 4 | 4 | ? | Are multiple draw downs allowed? |
| 4 | 5 | Y | First Payment |
| 4 | 6 | ? | Can a loan be written of before any payments have been made? |
| 5 | 1 | N | |
| 5 | 2 | N | |
| 5 | 3 | N | |
| 5 | 4 | ? | Are multiple draw downs allowed? |
| 5 | 5 | Y | Payment during life of loan |
| 5 | 6 | Y | If account balance = 0, loan discharged. If account balance < 0, loan default |
| 6 | 1 | N | |
| 6 | 2 | ? | Can rejected loans be reconsidered |
| 6 | 3 | ? | Can rejected loans be approved? |
| 6 | 4 | N | |
| 6 | 5 | ? | Can written off loans be reinstated? |
| 6 | 6 | N | |

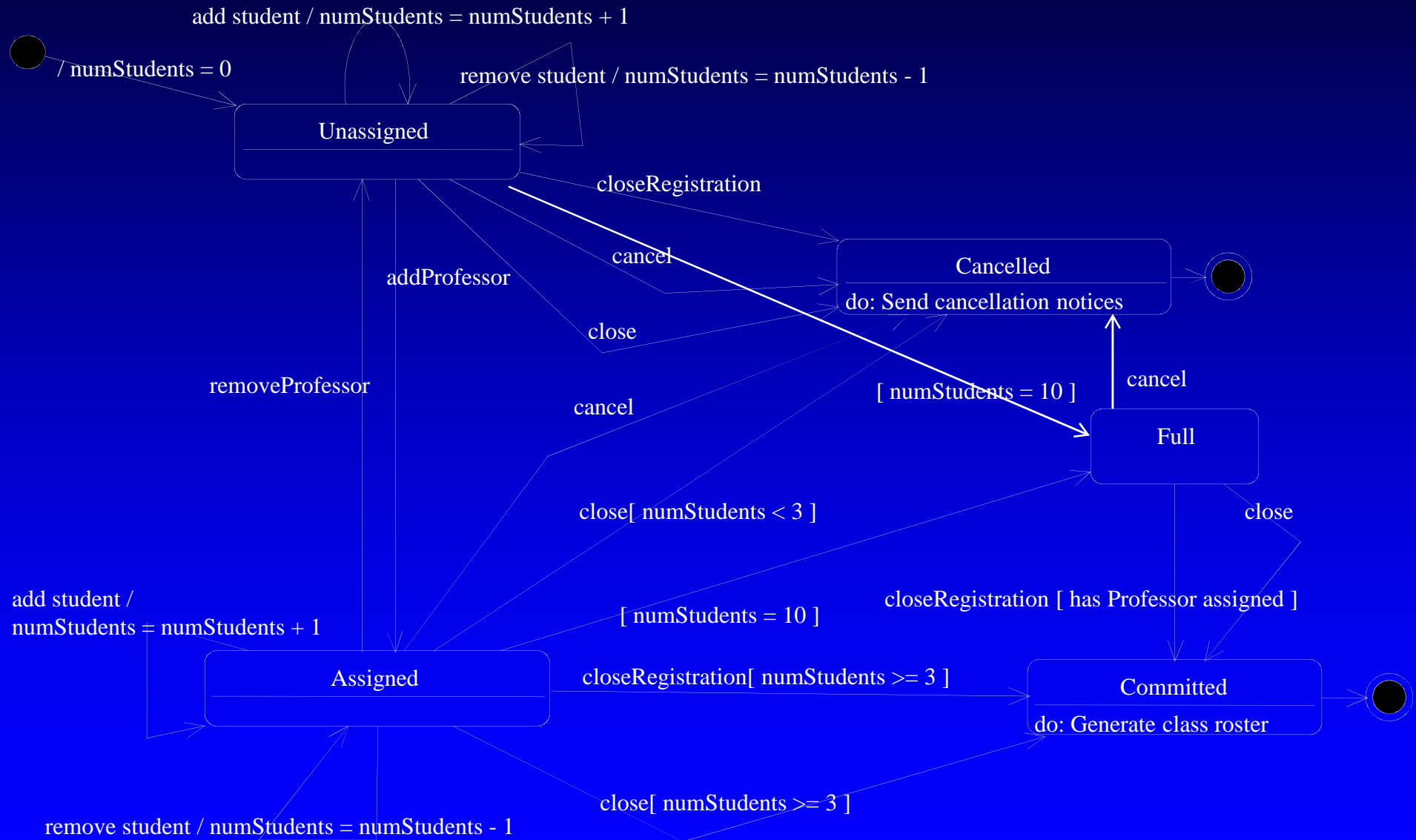Table 2: State Table for a Bank Loan



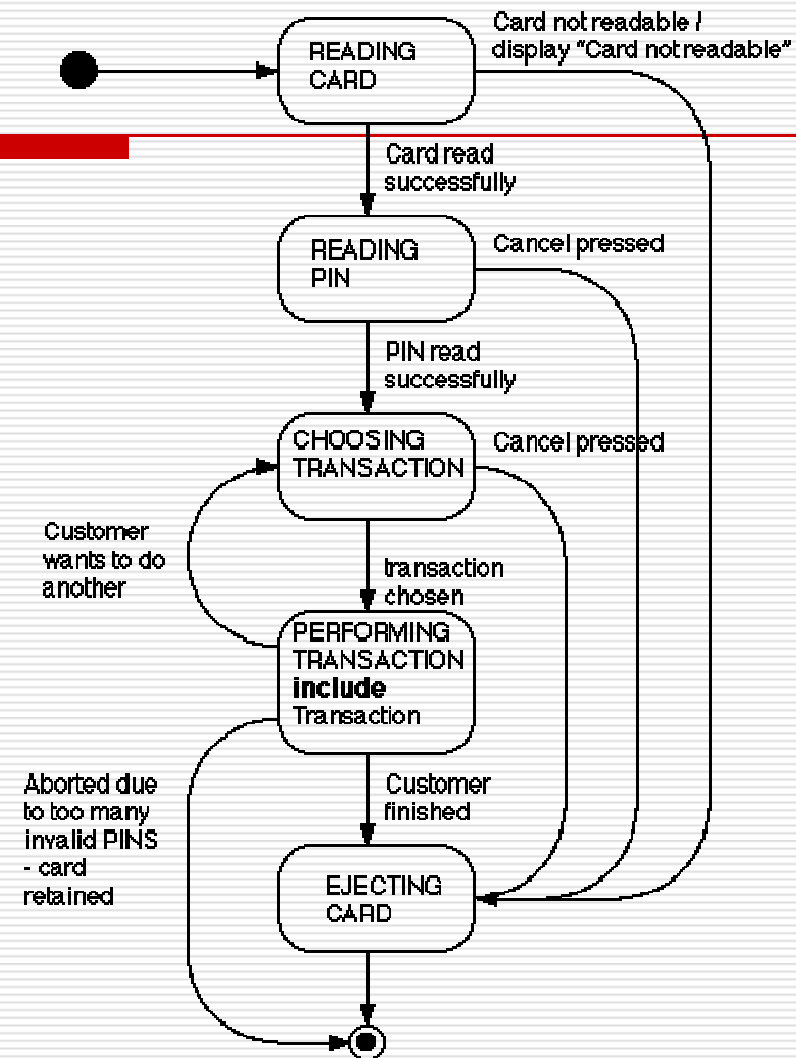Figure 4: State transition diagram for a Bank Loan

# Exercise
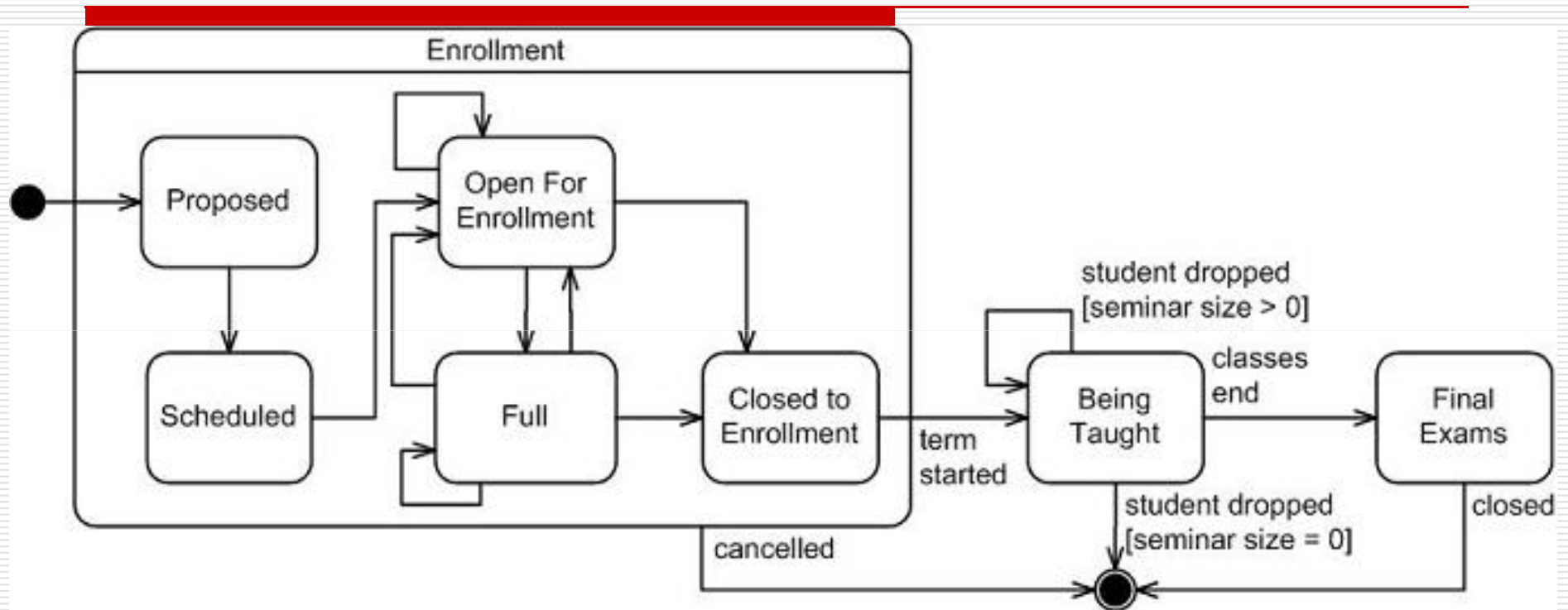
# Statechart for Course Offering



add student / numStudents = numStudents + 1

/ numStudents = 0

remove student / numStudents = numStudents - 1

Unassigned

closeRegistration

cancel

Cancelled

do: Send cancellation notices

addProfessor

close

cancel

removeProfessor

[ numStudents = 10 ]

cancel

Full

cancel

close[ numStudents < 3 ]

close

add student /
numStudents = numStudents + 1

[ numStudents = 10 ]

closeRegistration [ has Professor assigned ]

Assigned

closeRegistration[ numStudents >= 3 ]

Committed

do: Generate class roster

remove student / numStudents = numStudents - 1

close[ numStudents >= 3 ]

# Statechart

READING CARD

Card not readable / display "Card not readable"

Card read successfully

READING PIN

Cancel pressed

PIN read successfully

CHOOSING TRANSACTION

Cancel pressed

Customer wants to do another

transaction chosen

PERFORMING TRANSACTION
**include**
Transaction

Aborted due to too many invalid PINS - card retained

Customer finished

EJECTING CARD

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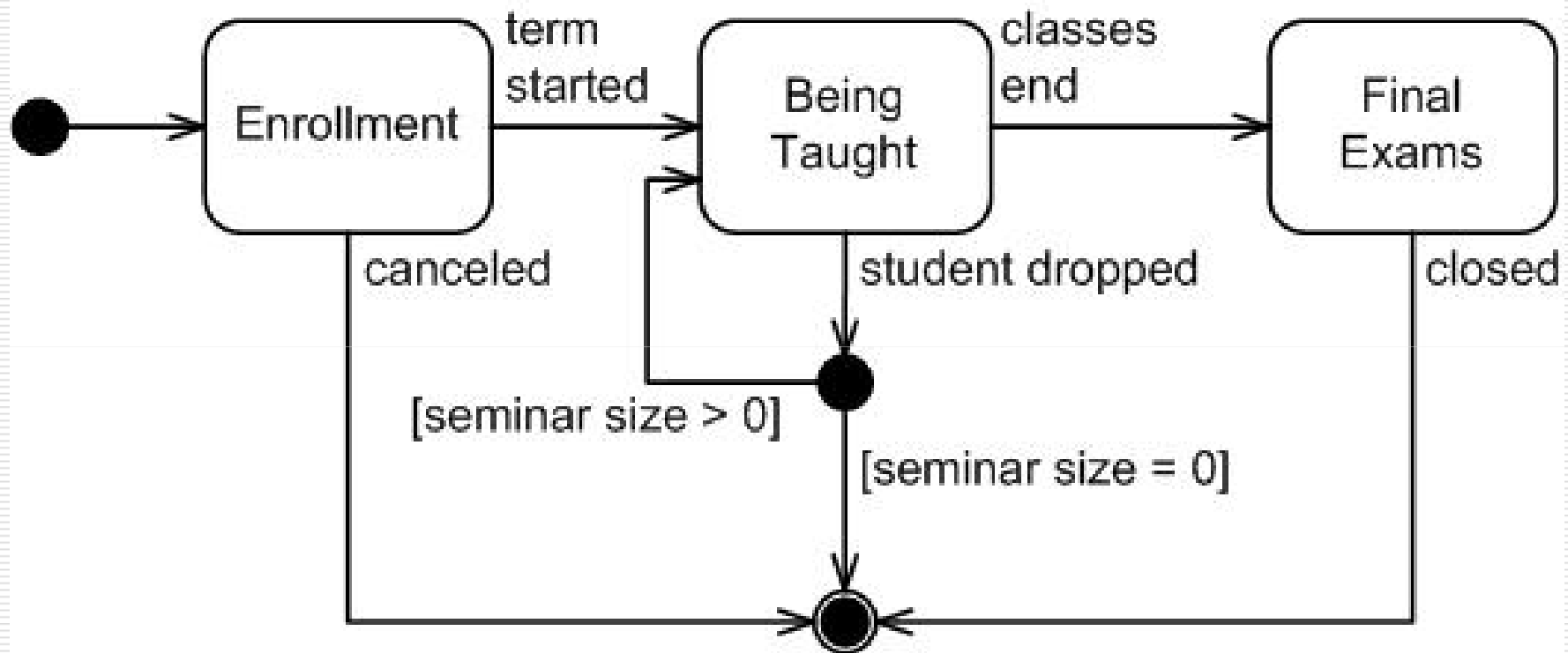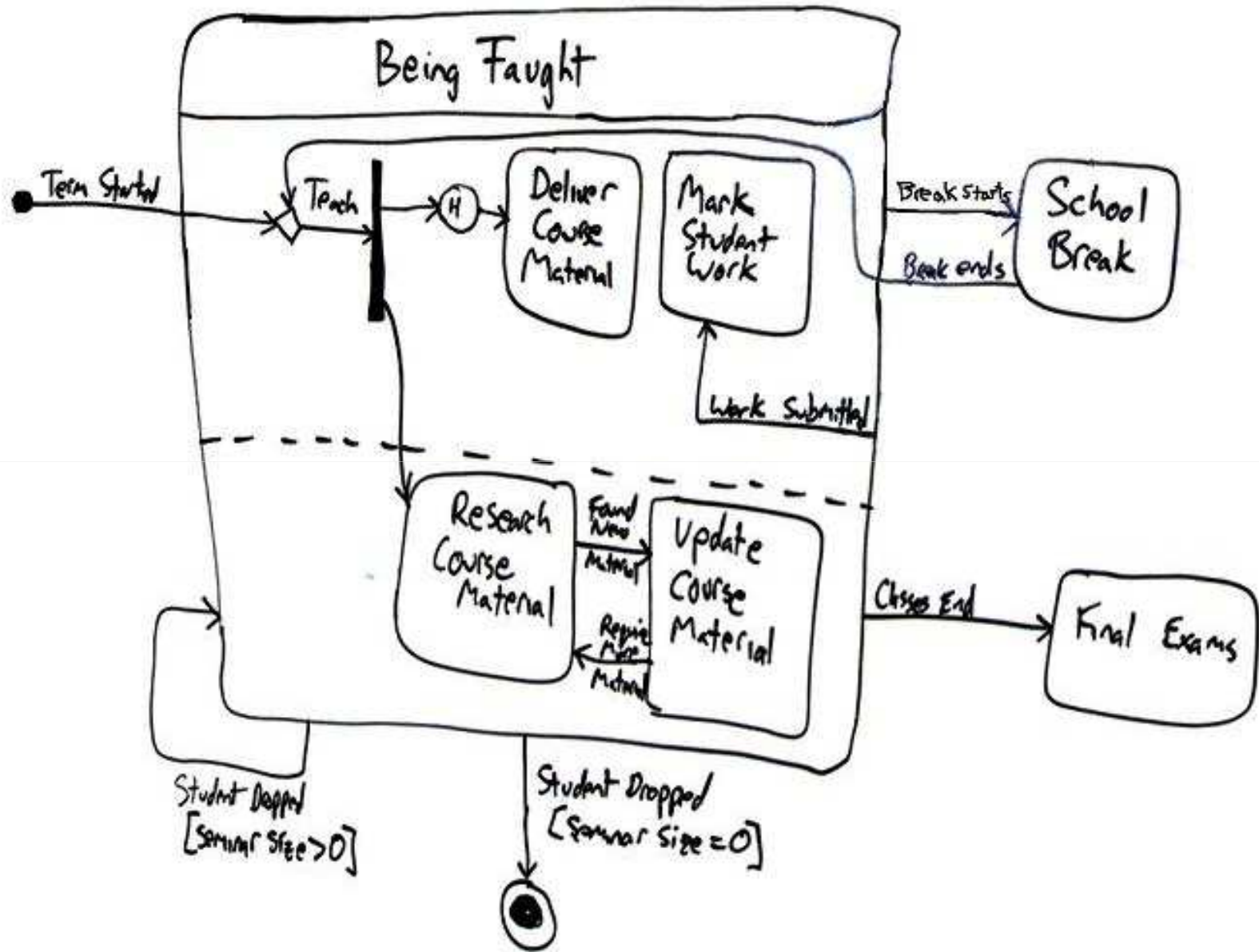
# Bài tập

- ☐ Tài khoản mobifone
- ☐ Thẻ thành viên
- ☐ Máy ATM
- ☐ Bài tập Moodle
- ☐ Trạng thái 1 sinh viên
- ☐ Môn học trong hệ thống ĐKHP
- ☐ Trạng thái 1 bug