

CRC

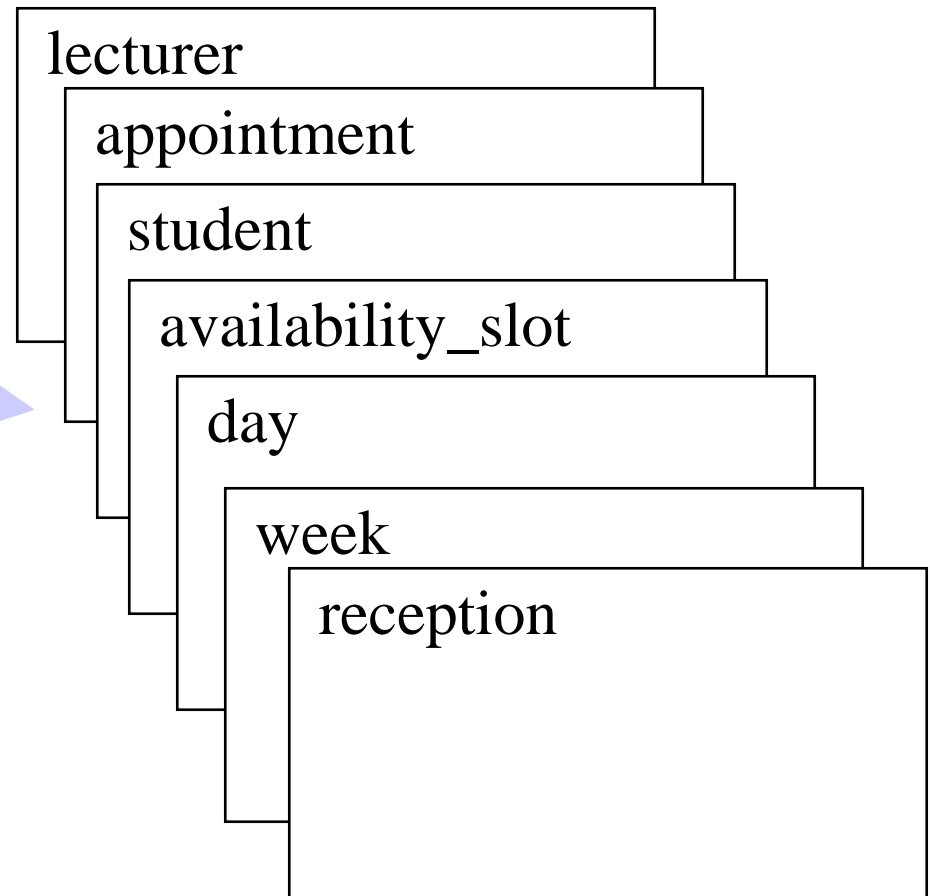
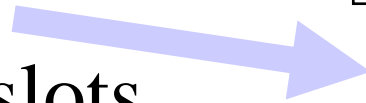
- ***class***
- ***responsibility***
- ***collaborator***
- ***CRC (Class Responsibility Collaborator) cards are "low tech": ordinary index cards***

Class Name	
Responsibilities	Collaborators
...	...

- ***Key idea: objects have responsibilities, as if they were simple agents (or actors in scenarios)***
- ***Each object is responsible for specific actions client can expect predictable behaviors***
- ***Responsibility also implies independence: to trust an object to behave as expected is to rely upon its autonomy and modularity***

Candidate class - CRC card

- Lecturers
- appointments
- students
- availability slots
- day
- week
- reception



CRC card - format (FRONT)

Class:

Base:

Derived:

responsibilities

collaborators

CRC card - format (BACK)

Description:

Class

- ***Promote all of the nouns in the candidate class list to CRC cards.***
- ***Some of them may be thrown away in the subsequent discussion.***
- ***New classes may be added latter.***
- ***Use BASE and DERIVED fields to hold inheritance information.***

responsibility

- *What is each class responsible for knowing.*
- *What is each class responsible for doing.*

collaborator

- ***Consider each responsibility in turn***
- ***Decide whether the class under discussion fulfils the responsibility itself, or whether it get help from another class.***

ATM Problem CRC cards

1. Class ATM - with component parts:

1. Class CardReader

2. Class Display

3. Class Keyboard

4. Class CashDispenser

5. Class EnvelopeAcceptor

6. Class ReceiptPrinter

7. Class OperatorPanel

ATM Problem CRC cards

2. Class Session

*3. Class Transaction - with
subclasses:*

1. Class WithdrawlTransaction

2. Class DepositTransaction

3. Class TransferTransaction

4. Class InquiryTransaction

4. Class Bank

ATM Problem CRC cards

Class ATM

Responsibility

Start up system operation

Start a session for each customer as he/she arrives

Shut down on operator request

Get PIN from customer

Get customer choice from a menu of options

Get amount entry (typed in) from customer

Collaborator(s)

OperatorPanel

Display

CardReader

Session

OperatorPanel

Display

Keyboard

Display

Keyboard

Display

Keyboard

ATM Problem CRC cards

Class ATM

Responsibility

Verify that sufficient cash is available for withdrawal

Dispense cash

Accept deposit envelope from customer

Issue receipt to customer

Require customer to re-enter PIN

Inform customer of reason for failure of a transaction, and ask if he/she wants another

Return ATM card to customer

Permanently retain customer card

Collaborator(s)

CashDispenser

CashDispenser

Display

Envelope Acceptor

ReceiptPrinter

Display

Keyboard

Display

Keyboard

CardReader

Display

CardReader

ATM Problem CRC cards

Class Keyboard

Responsibility

Read PIN

**Read choice from menu Read
amount entry (typed)**

Collaborator(s)

Display (echo *'s)

Display (echo amount)

ATM Problem CRC cards

Class Display

Responsibility

Collaborator(s)

Display "Insert Card" screen

Display "Enter PIN" screen

Display menu of choices

Display "Enter Amount" screen

Display "Deposit Envelope" screen

Display "Card unreadable" screen

Display "Transaction failed because ... want another?" screen

Display "Invalid PIN - re-enter" screen

Display "Card retained" screen

Echo input from the keyboard

Clear current message from screen when no longer needed

Class Session

Responsibility

Perform session use case

Perform invalid PIN extension

Perform failed transaction extension

Furnish card number to Transaction

Furnish PIN to Transaction

Collaborator(s)

ATM

Transaction

ATM

Transaction

ATM

Class Transaction

Responsibility

Allow customer to choose a transaction type then create an object of appropriate subclass

Collaborator(s)

Withdrawal Transaction

DepositTransaction

TransferTransaction

InquiryTransaction

ATM

Class WithdrawTransaction

Responsibility

Get specifics from customer

Send to bank

**Dispense cash, issue receipt, and
notify bank when complete**

Collaborator(s)

ATM

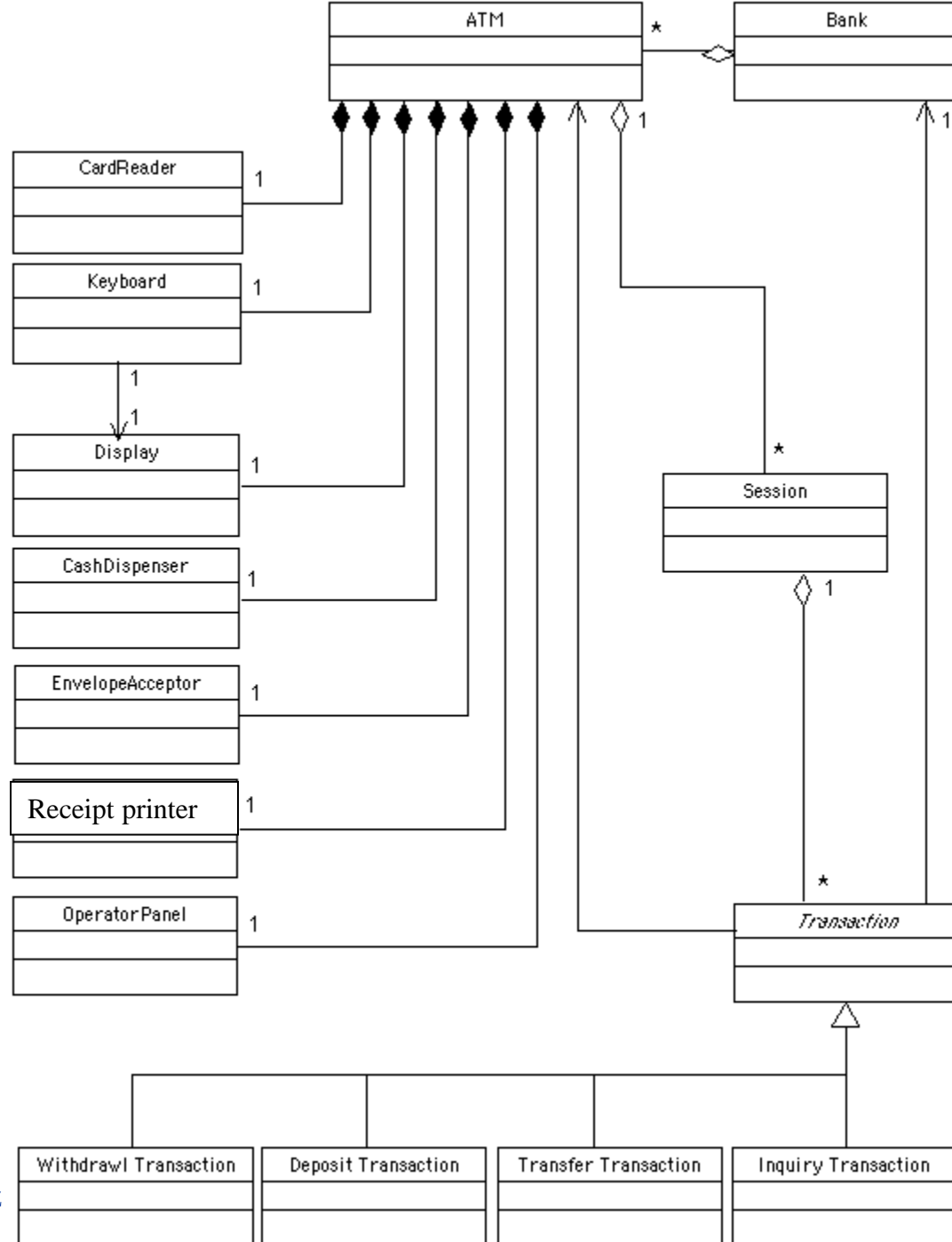
Session

Bank

ATM

Bank

ATM Example System Class Diagram



**Do a detailed reading of Pressman chapter 19
and 20**