

Isolation

6.033 2008 Lecture 18

"Simple Locking" example

```
xfer(A, B, amt)
  BeginTransaction
    acquire A
    acquire B
    read A
    write A
    read B
    write B
  Commit
  release A
  release B
```

2

Withdrawal in foreign currency

```
Withdraw(Account, Currency, amt)
  BeginTransaction
    acquire Account
    acquire Currency
    if amt * Currency < Account
      Account = Account - (amt * Currency)
  Commit
  release Account
  release Currency
```

3

Read / write locks

```
Withdraw(Account, Currency, amt)
  BeginTransaction
    write-acquire Account
    read-acquire Currency
    if amt * Currency < Account
      Account = Account - (amt * Currency)
  Commit
  release Account
  release Currency
```

4

Cashing a check

```
CashCheck(CheckingAcct, amt)
  BeginTransaction
    write-acquire CheckingAcct
    read-acquire ???
    SavingsAcct = FindSavings(CheckingAcct)
    if amt ≤ SavingsAcct + CheckingAcct
      CheckingAcct = CheckingAcct - amt
  Commit
  release CheckingAccount
  release SavingsAccount
```

5

Delayed lock acquire

```
CashCheck(CheckingAcct, amt)
  BeginTransaction
    write-acquire CheckingAcct
    SavingsAcct = FindSavings(CheckingAcct)
    read-acquire SavingsAcct
    if amt ≤ SavingsAcct + CheckingAcct
      CheckingAcct = CheckingAcct - amt
  Commit
  release CheckingAccount
  release SavingsAccount
```

6

Early release

```
CashCheck(CheckingAcct, amt)
  BeginTransaction
  write-acquire CheckingAcct
  SavingsAcct = FindSavings(CheckingAcct)
  read-acquire SavingsAccount
  if amt ≤ SavingsAcct + CheckingAcct
    CheckingAcct = CheckingAcct - amt
  release SavingsAccount
  Commit
  release CheckingAccount
```

7

Broken early release

```
CashCheck(CheckingAcct, amt)
  BeginTransaction
  write-acquire CheckingAcct
  SavingsAcct = FindSavings(CheckingAcct)
  read-acquire SavingsAccount
  if amt ≤ SavingsAcct + CheckingAcct
    CheckingAcct = CheckingAcct - amt
  release SavingsAccount
  release CheckingAccount
  Commit
```

8