

## Views

## External View of Ansi-Sparc Architecture

- In most relational DBMS a view is a virtual relation which acts as a dynamic window on the base relations
- Materialised views are a research issue and raise consistency issues
- A view can be queried as if it were a base relation, but may not be updatable as if it were a base relation

- Views are recomputed from the base relations each time they are used
- Views are useful for
  - logical data independence
  - simplification
  - security
  - integrity management

## Views: Security

View

CS_STUDENT			
studno	name	tutor	year
s3	smith	goble	2
s5	jones	zobel	1

Base Relation

STUDENT				
studno	name	hons	tutor	year
s1	jones	ca	bush	2
s2	brown	cis	kahn	2
s3	smith	cs	goble	2
s4	bloggs	ca	goble	1
s5	jones	cs	zobel	1
s6	peters	ca	kahn	3

```
create view cs_students as
(select studno, name, tutor, year
from student where hons = 'cs');
```

## Views: Query Simplification

Course_Staff			
course no	subject	lecturer	roomno
cs250	prog	lindsey	2.10
cs260	graphics	kahn	IT206
cs270	elec	woods	IT204

COURSE		STAFF		
course no	subject	lecturer	roomno	appraiser
cs250	prog	lindsey	2.10	woods
cs260	graphics	kahn	IT206	watson
cs270	elec	woods	IT204	barringer

```
create view course_staff as
(select courseno, subject, staff.lecturer, roomno
from course, staff
where course.lecturer = staff.lecturer);
```

## Views: Query Simplification

un-updateable

Course_Totals	
courseno	count
cs250	2
cs260	1
cs270	3

```
create view coursetotals as
(select courseno, count(*)
from enrol
group by courseno);
```

ENROL			
stud no	course no	lab mark	exam mark
s1	cs250	65	52
s1	cs260	80	75
s1	cs270	47	34
s2	cs250	67	55
s2	cs270	65	71
s3	cs270	49	50
s4	cs280	50	51
s5	cs250	0	3
s6	cs250	2	7

## Updatability of Views (Oracle 8)

- If the view query contains any of the following constructs it is not inherently modifiable, and you therefore cannot perform inserts, updates, or deletes on the view:
  - set operators
  - group functions
  - the DISTINCT operator
  - joins (a subset of join views are updatable if they are key-preserving- all keys to base tables must be in view and the keys in the view must still be unique and not null)
- If a view contains pseudocolumns or expressions, you can only update the view with an UPDATE statement that does not refer to any of the pseudocolumns or expressions.

## Views: Logical Data Independence

STUDENT					
studno	name	hons	tutor	year	totalaverage
s1	jones	ca	bush	2	56
s2	brown	cis	kahn	2	42
s3	smith	cs	goble	2	75
s4	bloggs	ca	goble	1	62

### Restructured Database

STUDENT_DETAILS				
studno	name	hons	tutor	year
s1	jones	ca	bush	2
s2	brown	cis	kahn	2
s3	smith	cs	goble	2
s4	bloggs	ca	goble	1

MARKS	
studno	totalaverage
s1	56
s2	42
s3	75
s4	62

```
create view student as
(select sd.studno, name, hons, tutor, year, totalaverage
from student_details sd, marks
where sd.studno = marks.studno);
```

## Views: Data Integrity

```
create view cs_students as
(select studno, name, tutor, year
from student where hons = 'cs')
with check option constraint cs;
```

- Check option enforces the constraint that any insert or update on the view satisfy the where clause