

Public Service Announcement

"Camp Sudo is looking for motivated, qualified teaching fellows to lead 5-week intensive computer science summer camps in the Bay Area! You and a colleague will inspire young high school minds through code education by leading them on a curriculum that covers basic computer science fundamentals (HTML, CSS, JS). The position is stipended and relocation will be made available. Applications due APRIL 22ND, 2016. Online Application at <http://bit.ly/1UOMFJn> and Job Description at <http://bit.ly/1qaEpXi> Questions? Email chenchen@campsudo.org <chenchen@campsudo.org>."

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Lecture 32: More SQL

- Abstractly, a `select` statement that lists multiple tables filters *all possible combinations of rows* from those tables.

```
> create table T1 as
  select "a" as val union select "b";
> create table T2 as
  select 1 as val union select 2;
> select T1.val, T2.val from T1, T2;
a|1
a|2
b|1
b|2
```

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Comparison to Python

- This includes the case where the same table is named twice, as in

```
select A.val, B.val from T1 as A, T1 as B;
a|a
a|b
b|a
b|b
```
- Thus, the `select ... from ...` part is rather like the `for` part of a list comprehension in Python:

```
[ (A.val, B.val) for A from T1 for B from T1 ]
```
- The `where` clause is now a filter, like the `if` clause in a list comprehension.

```
> select A.val, B.val from T1 as A, T1 as B
  where A.val <= B.val;
a|a
a|b
b|b
```

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Expressions

- Familiar arithmetic is possible:

```
> select 3 + 4;
7
> select 3+GP from grade_values;
7
7
6.7
6
6.3
...
```
- Also string operations (not quite like Python):

```
> select First || " " || Last from students;
Jason Knowles
Valerie Chan
...
```

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Aggregation

- Certain expressions *aggregate* results:

```
> select avg(GP) from grades, grade_values
  where Letter=Grade and SID = 101;
3.25

> select max(GP) from grades, grade_values
  where Letter=Grade and SID = 101;
3.7
> select count(GP) from grades, grade_values
  where Letter=Grade and SID = 101;
4
```

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