SQL

Announcements

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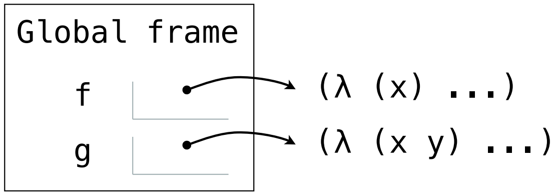

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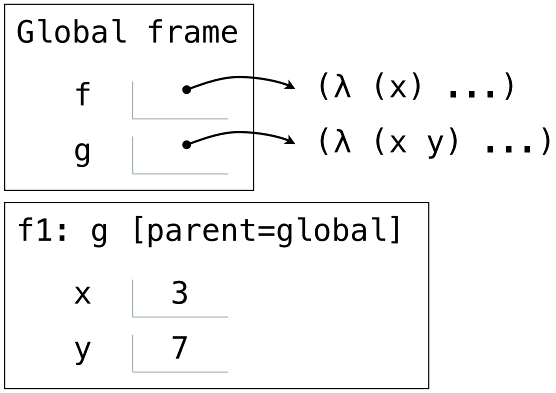

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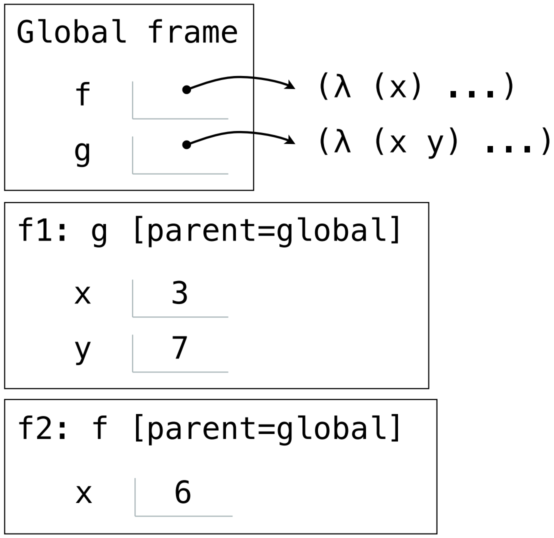

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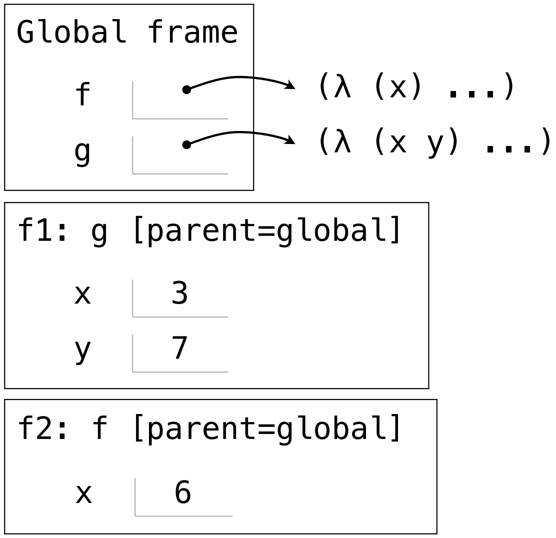

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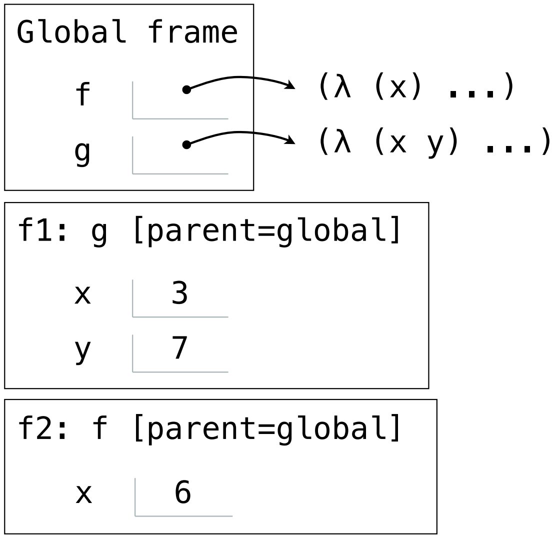

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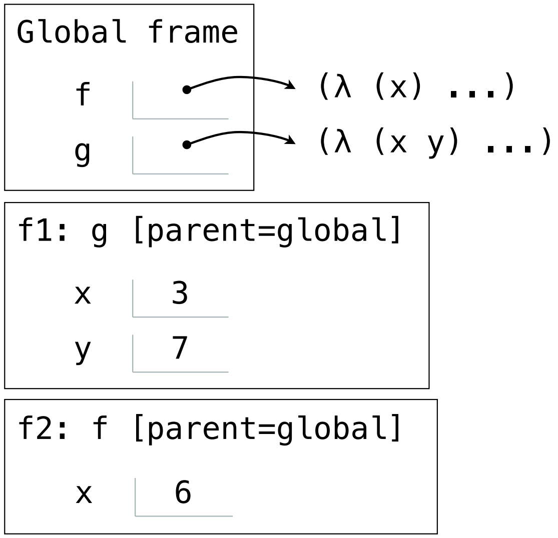

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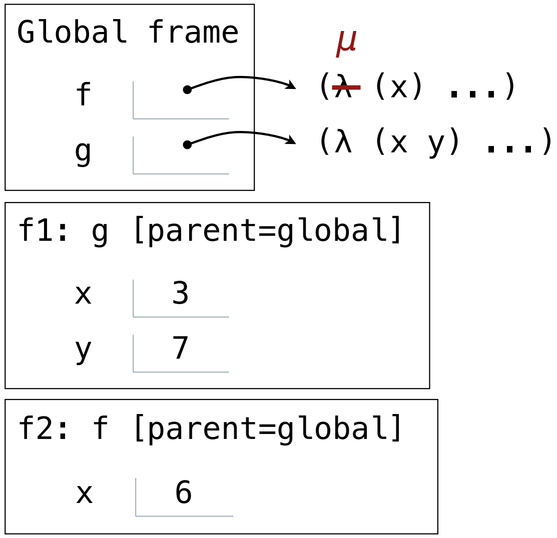

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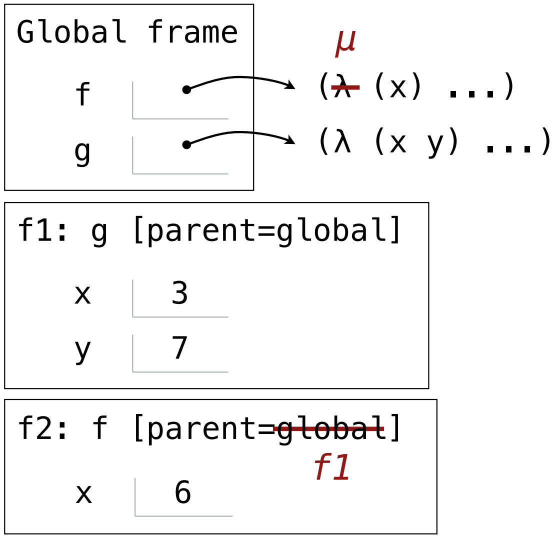

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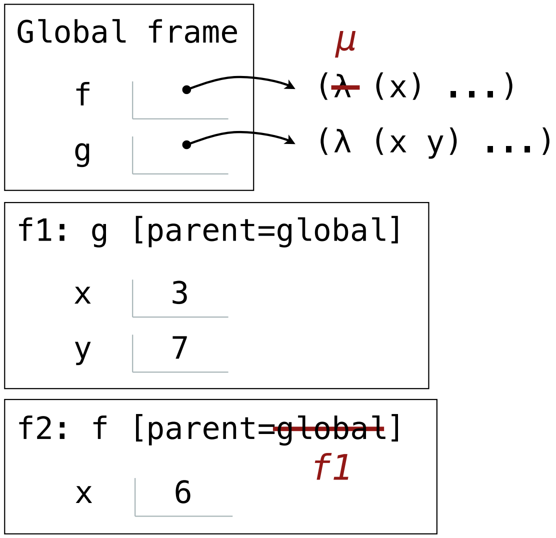

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Databases

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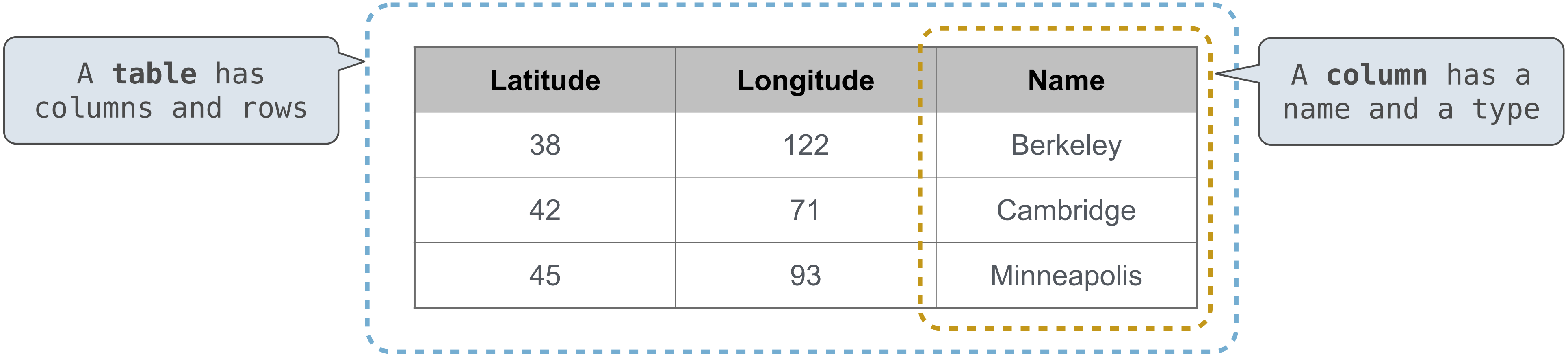

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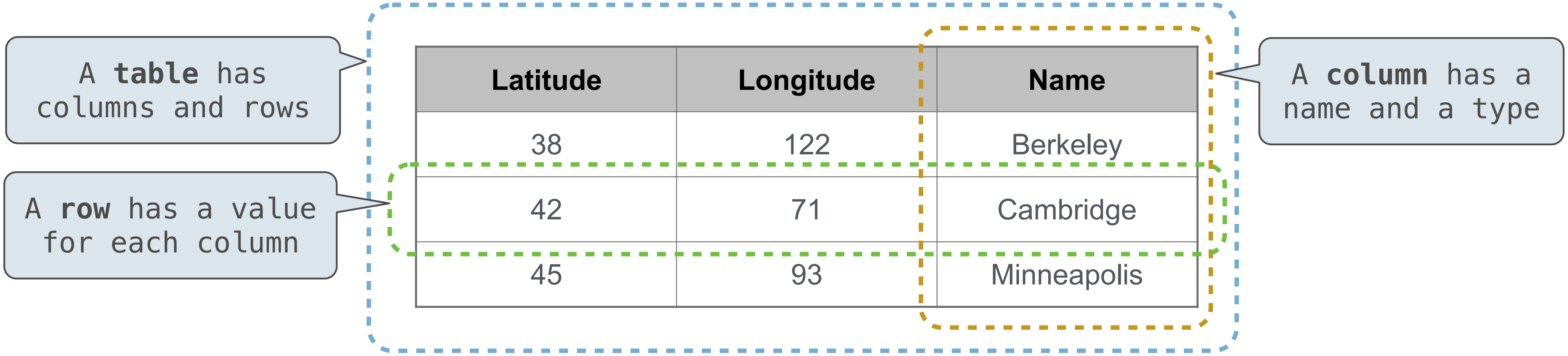

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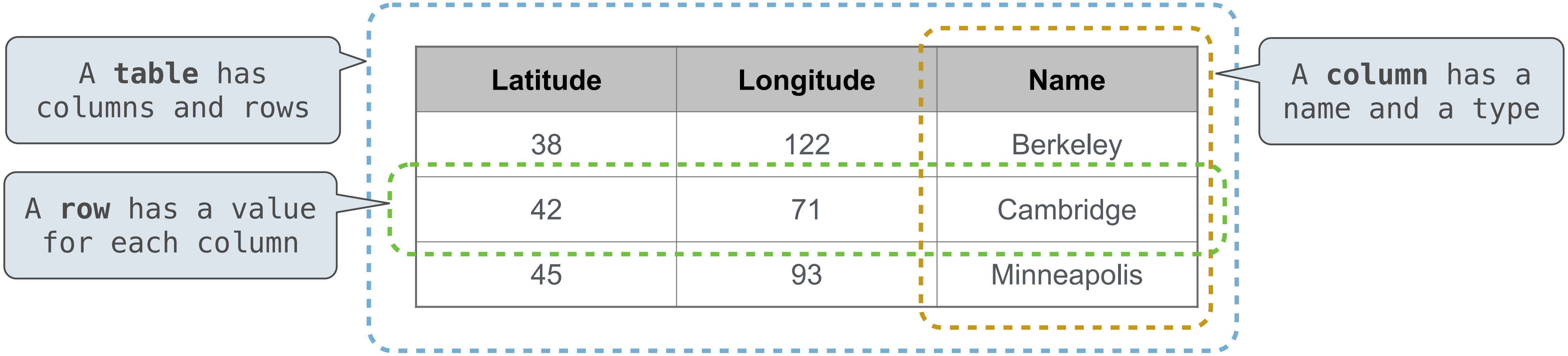

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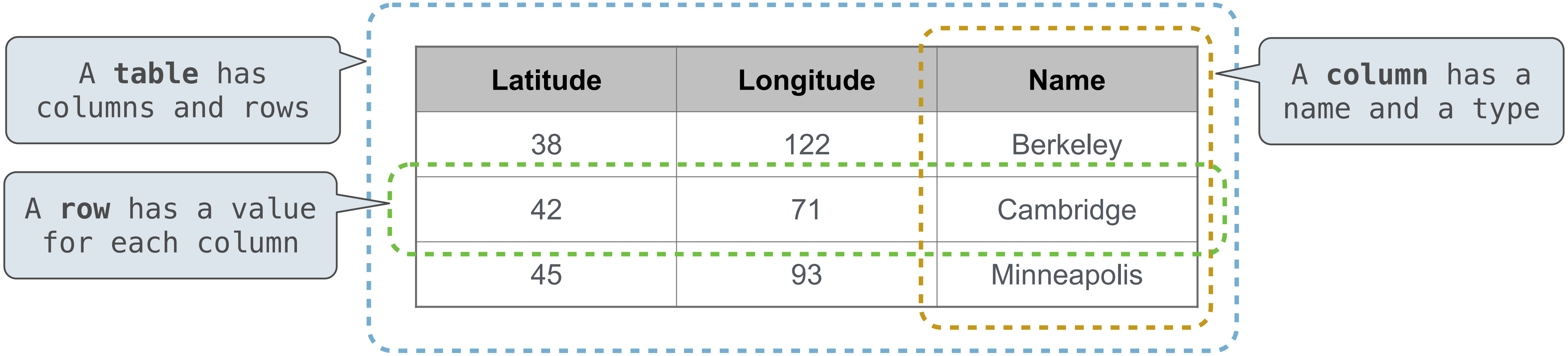

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Structured Query Language (SQL)

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http://awhimsicalbohemian.typepad.com/.a/6a00e5538b84f3883301538dfa8f19970b-800wi

Getting Started with SQL

Install sqlite (version 3.8.3 or later): http://sqlite.org/download.html

Use sqlite online: code.cs61a.org/sql

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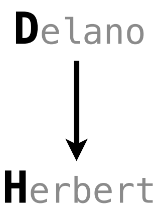

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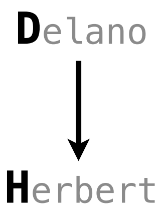

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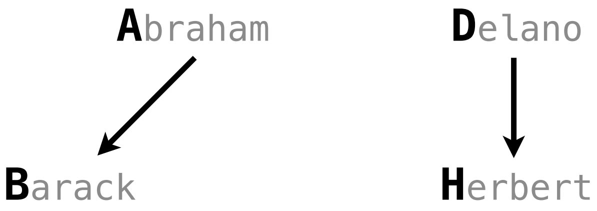

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The union of two select statements is a table
containing the rows of both of their results

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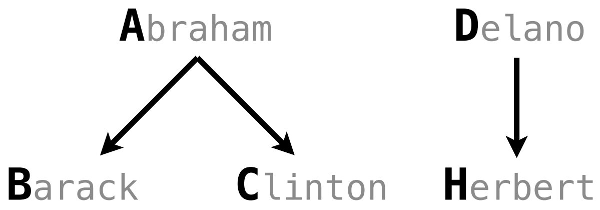

Selecting Value Literals

A **select** statement always includes a comma-separated list of column descriptions

A column description is an expression, optionally followed by **as** and a column name

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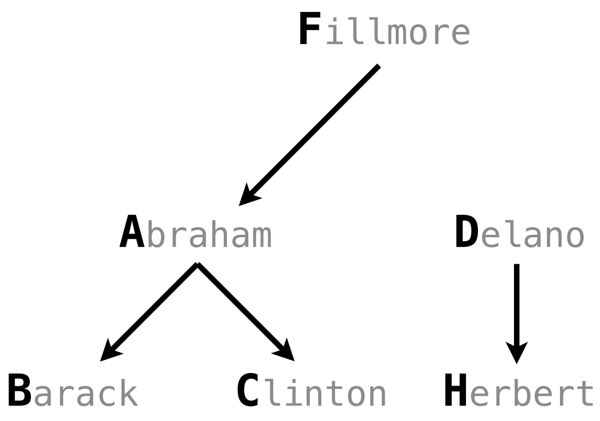

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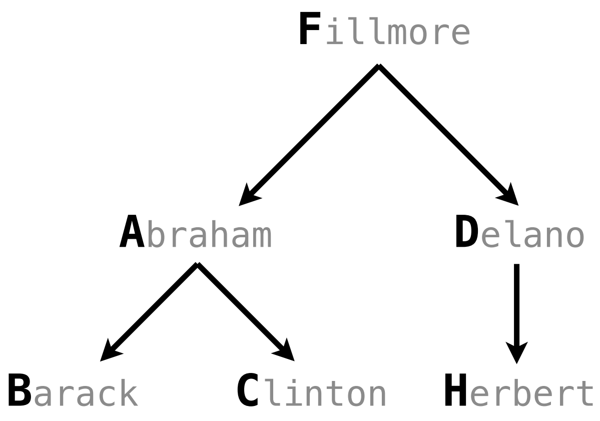

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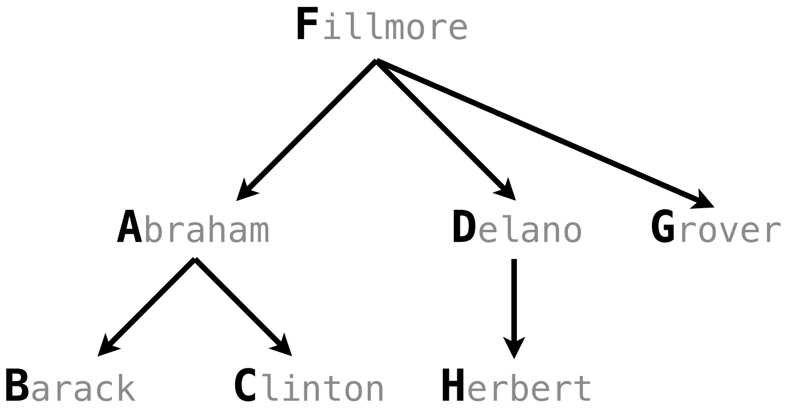

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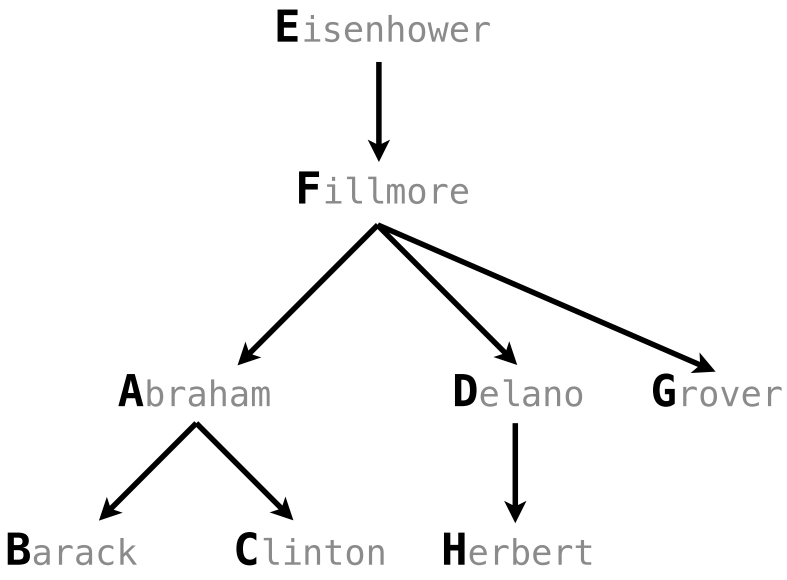

Naming Tables

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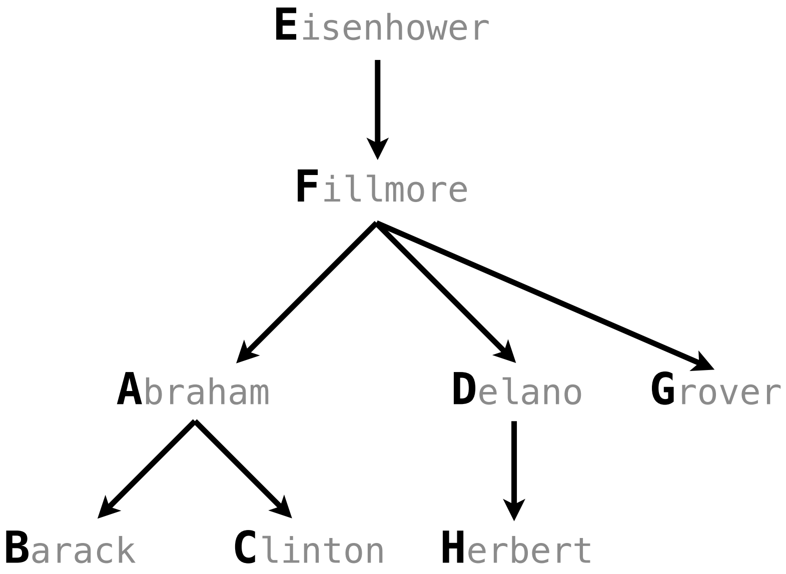

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SQL is often used as an interactive language

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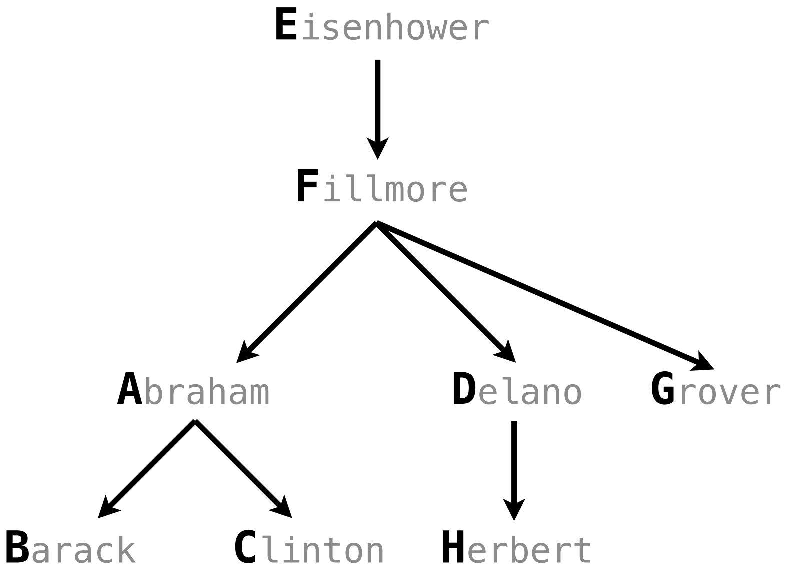

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The result of a **select** statement is displayed to the user, but not stored

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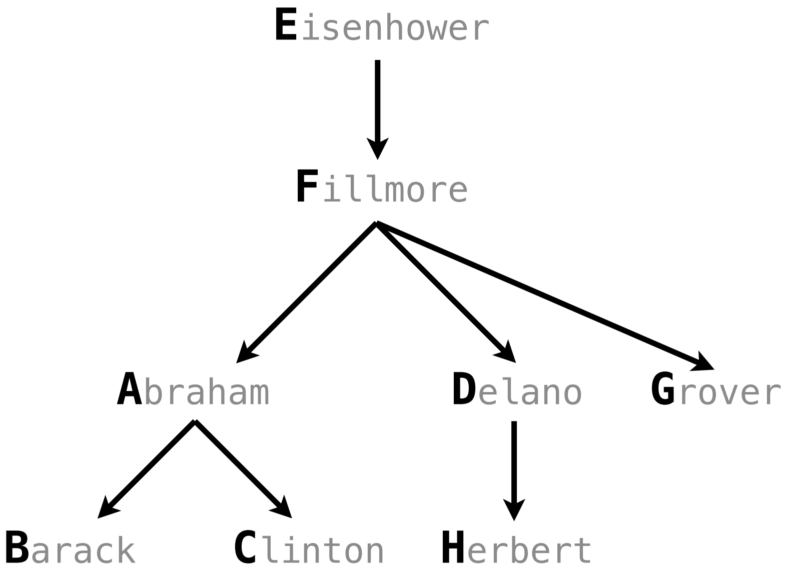

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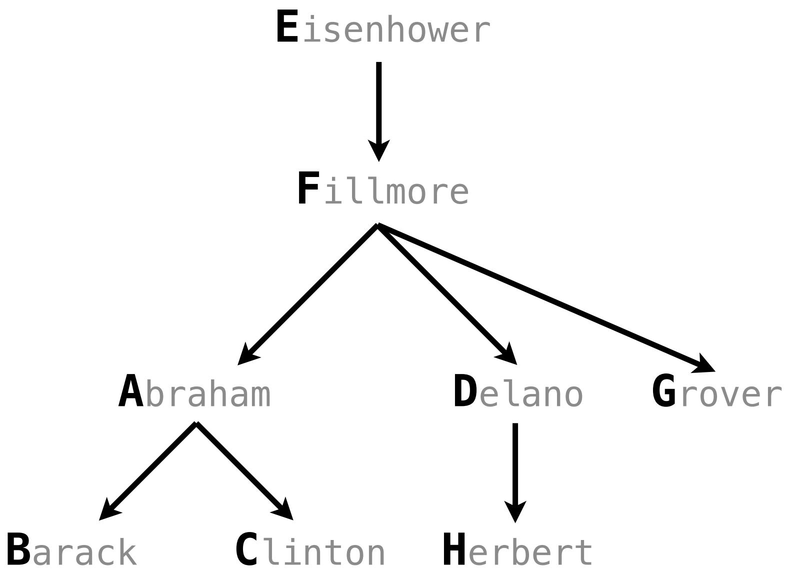

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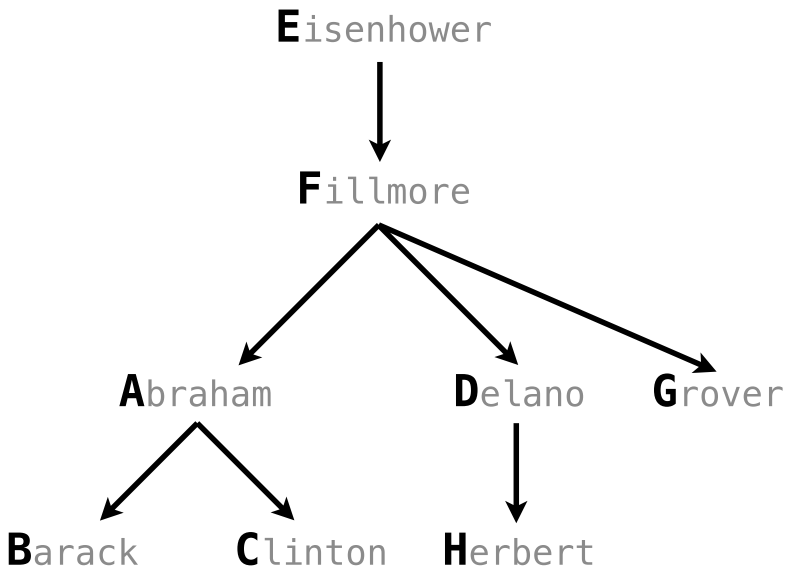

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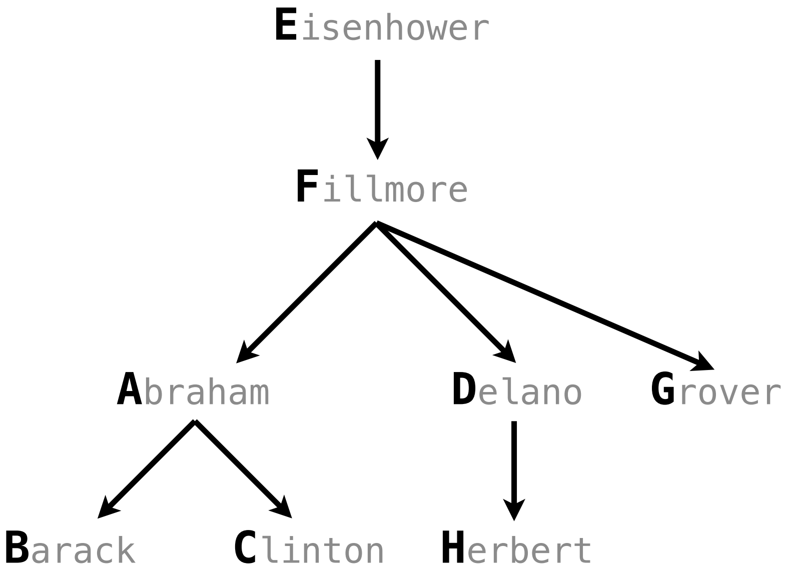

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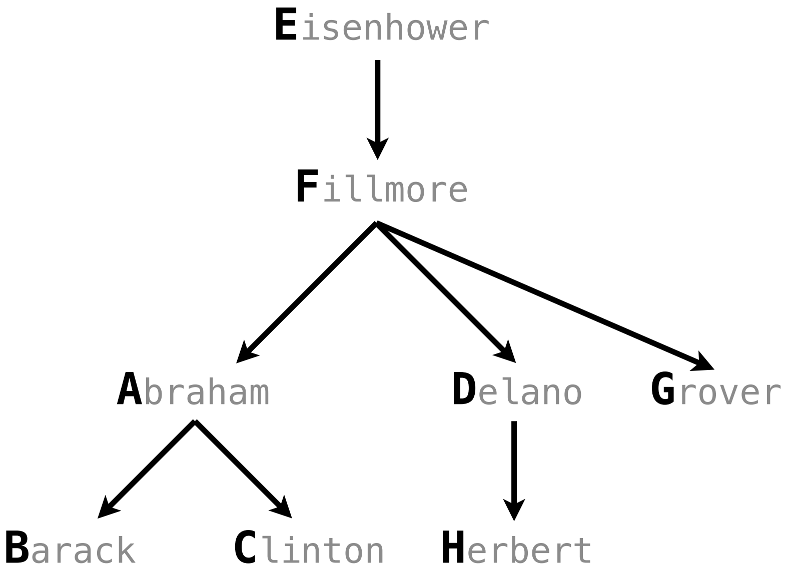

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```

Parents:

parent	child
abraham	barack
abraham	clinton
delano	herbert
fillmore	abraham
fillmore	delano
fillmore	grover
eisenhower	fillmore

Projecting Tables

Select Statements Project Existing Tables

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A **select** statement can specify an input table using a **from** clause

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```

Select Statements Project Existing Tables

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```
select [expression] as [name], [expression] as [name], ... ;

select [columns]                                            ;
```

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A **select** statement can specify an input table using a **from** clause

```
select [expression] as [name], [expression] as [name], ... ;

select [columns] from [table]                                ;
```

Select Statements Project Existing Tables

A **select** statement can specify an input table using a **from** clause

A subset of the rows of the input table can be selected using a **where** clause

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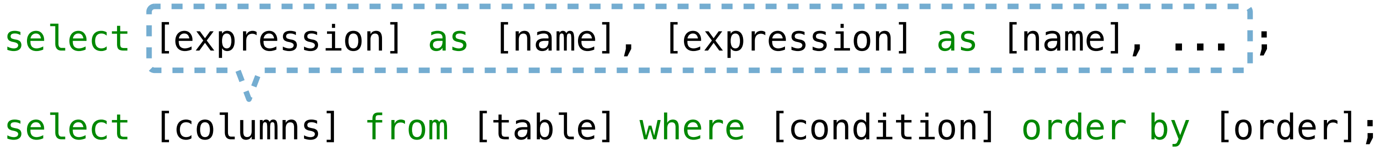

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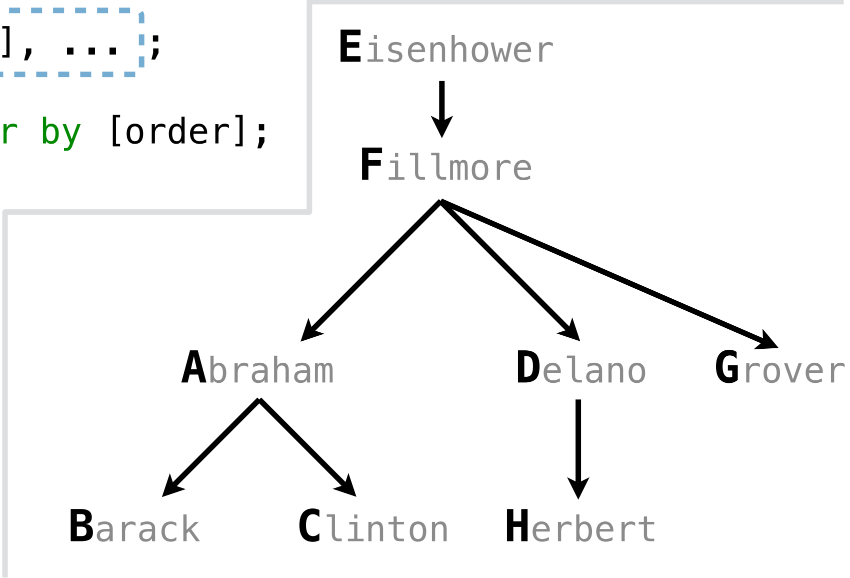

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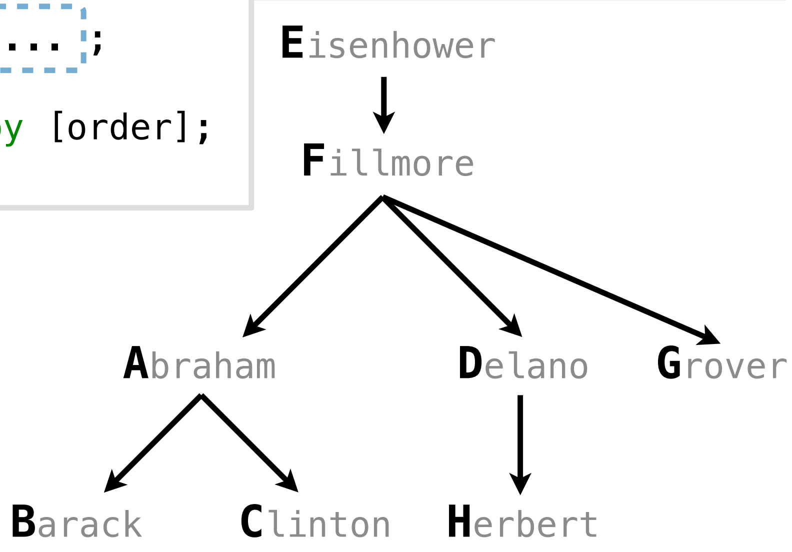

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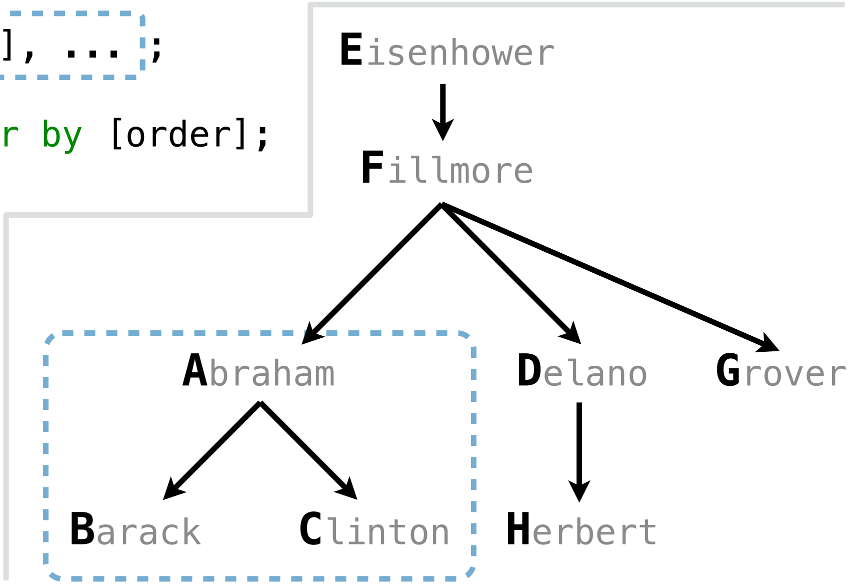

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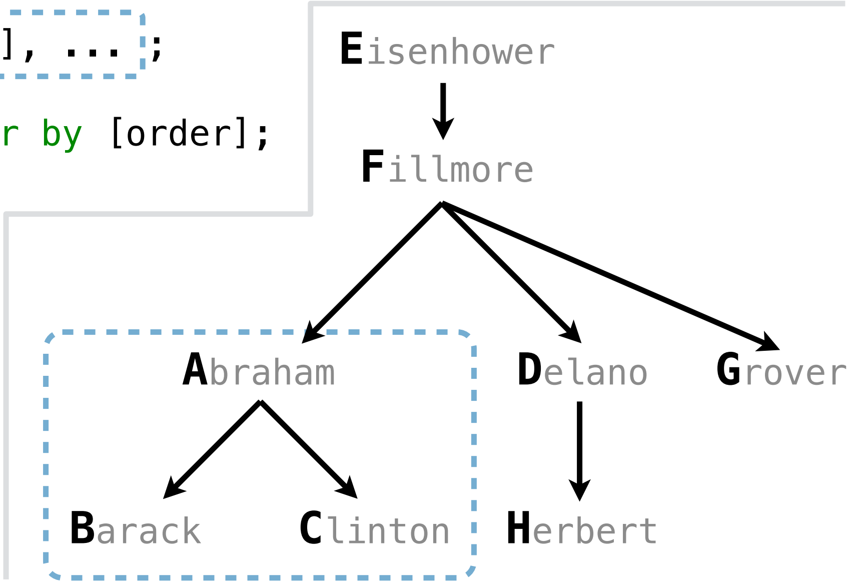
child
barack
clinton



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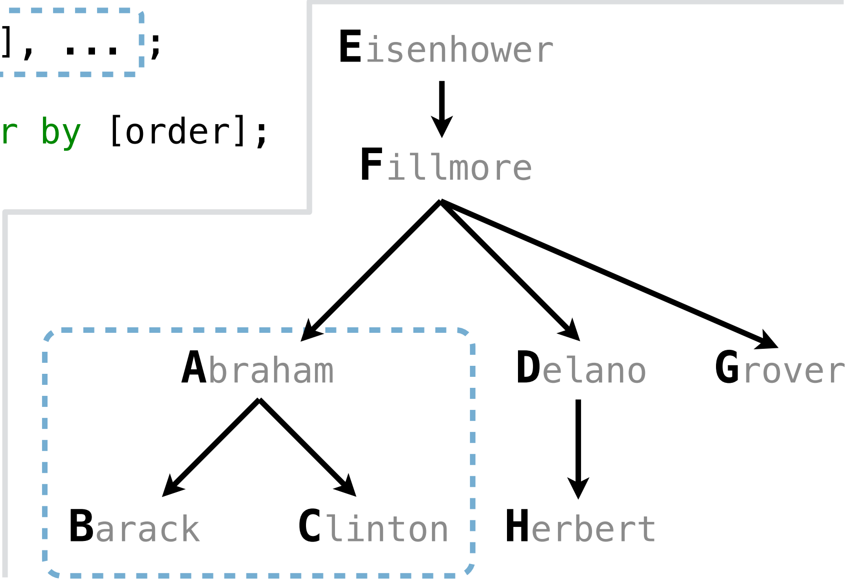

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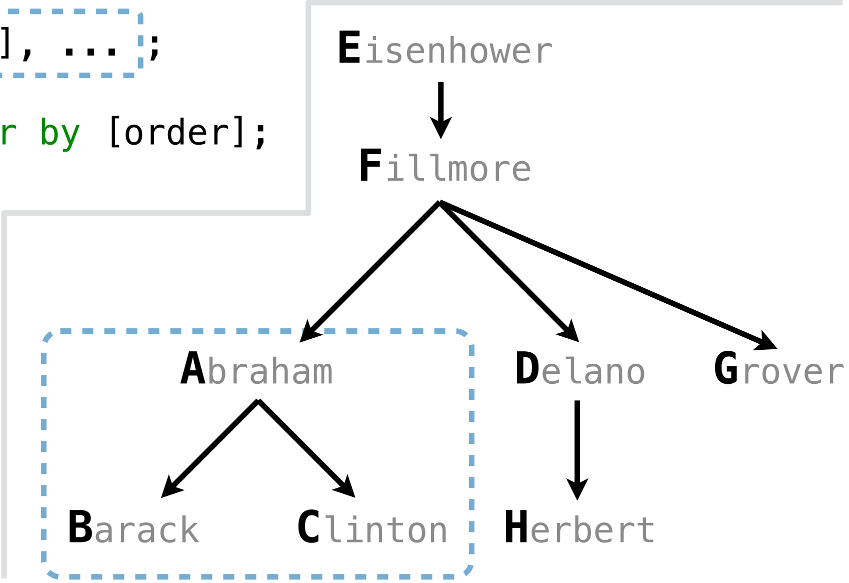
child
barack
clinton

parent
fillmore
fillmore



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child
barack
clinton

parent
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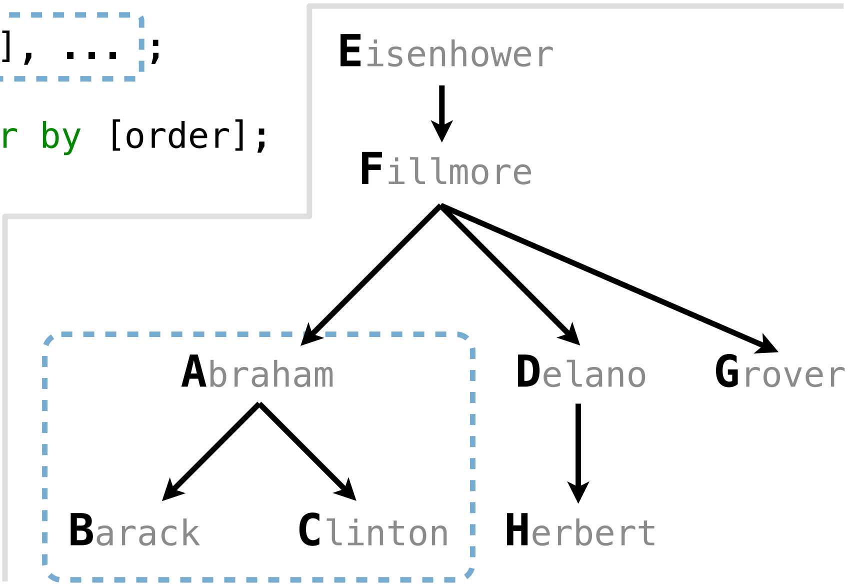
fillmore

(Demo)



Arithmetic

Arithmetic in Select Expressions

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In a select expression, column names evaluate to row values

Arithmetic expressions can combine row values and constants

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```
create table lift as
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  select 102         , 0          , 3           union
  select 103         , 4          , 1;
```

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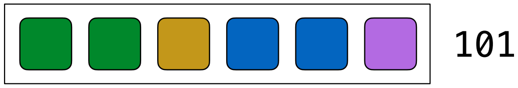

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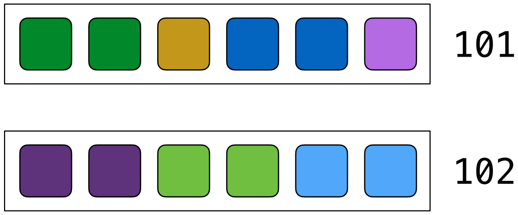

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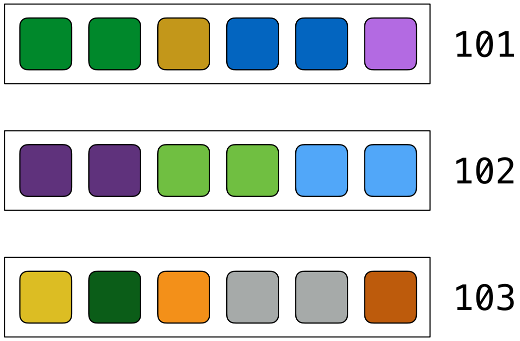

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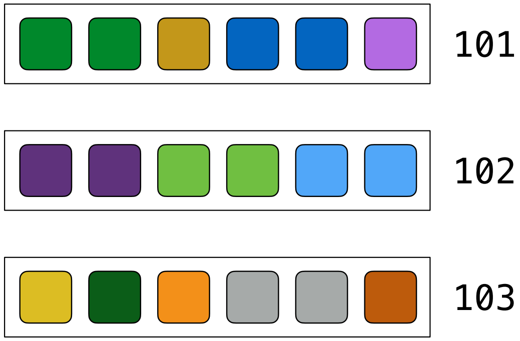
```
select chair, single + 2 * couple as total from lift;
```



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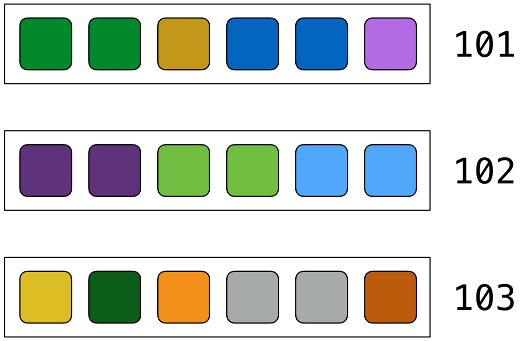

chair	total
101	6
102	6
103	6

Discussion Question

Given the table **ints** that describes how to sum powers of 2 to form various integers

```
create table ints as
  select "zero" as word, 0 as one, 0 as two, 0 as four, 0 as eight union
  select "one"         , 1       , 0       , 0        , 0          union
  select "two"         , 0       , 2       , 0        , 0          union
  select "three"       , 1       , 2       , 0        , 0          union
  select "four"        , 0       , 0       , 4        , 0          union
  select "five"        , 1       , 0       , 4        , 0          union
  select "six"         , 0       , 2       , 4        , 0          union
  select "seven"       , 1       , 2       , 4        , 0          union
  select "eight"       , 0       , 0       , 0        , 8          union
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(A) Write a select statement for a two-column table of the **word** and **value** for each integer

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(A) Write a select statement for a two-column table of the **word** and **value** for each integer

word	value
zero	0
one	1
two	2
three	3
...	...

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  select "two"         , 0       , 2       , 0        , 0          union
  select "three"       , 1       , 2       , 0        , 0          union
  select "four"        , 0       , 0       , 4        , 0          union
  select "five"        , 1       , 0       , 4        , 0          union
  select "six"         , 0       , 2       , 4        , 0          union
  select "seven"       , 1       , 2       , 4        , 0          union
  select "eight"       , 0       , 0       , 0        , 8          union
  select "nine"        , 1       , 0       , 0        , 8;
```

(A) Write a select statement for a two-column table of the **word** and **value** for each integer

word	value
zero	0
one	1
two	2
three	3
...	...

(B) Write a select statement for the **word** names of the powers of two

Discussion Question

Given the table **ints** that describes how to sum powers of 2 to form various integers

```
create table ints as
  select "zero" as word, 0 as one, 0 as two, 0 as four, 0 as eight union
  select "one"         , 1       , 0       , 0        , 0         union
  select "two"         , 0       , 2       , 0        , 0         union
  select "three"       , 1       , 2       , 0        , 0         union
  select "four"        , 0       , 0       , 4        , 0         union
  select "five"        , 1       , 0       , 4        , 0         union
  select "six"         , 0       , 2       , 4        , 0         union
  select "seven"       , 1       , 2       , 4        , 0         union
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(B) Write a select statement for the **word** names of the powers of two

word
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two
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eight

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... ...

(Demo)

(B) Write a select statement for the **word** names of the powers of two

word
one
two
four
eight