database keys

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what’s a key?

in a database table
› field can have same value in >1 row
› because no set-valued entries

eg, two reviews might have
› same rating, same by
› same rating, same about

but some values occur at most once
› review.id uniquely identifies tuple
› field that identifies tuple is a key

a key can be a combination of fields
› (by, about) may be a key
natural and surrogate keys

natural key
› from problem domain
› eg, email is key for users
› eg, SSN is key for employee

surrogate key
› generated by implementation
› eg, reviews.id

beware using natural keys
› cost of lookup: integer id smaller
› may become non-keys
  eg, email may be used by >1 family member
what’s a foreign key?

use of one table’s key in another table
› subjects.id is a key for subjects
› reviews.about is matched to subjects.id
› so about is a foreign key in reviews
how are keys declared?

programmer gives
› one key as primary
› additional keys as unique
› foreign keys with references

primary vs unique
› primary keys must be non null
› but messed up in SQLite

create table reviews (  
    id integer primary key,  
    by integer references users(id),  
    content text,  
    rating integer,  
    about integer references subjects(id),  
    unique (about, by)  
);
what does declaring keys do?

indexes
› creates indexes for optimizing queries

checking constraints
› on every update or delete
› exception thrown if broken

maintaining constraints
› propagate changes on foreign keys
› user specifies action:
   restrict: disallows change, no exception
   cascade: deletes or updates associated row

see http://www.sqlite.org/foreignkeys.html