Postgres 3
Trigger Problems

• create a table called NameChangeLog. The table records changes to the last name of customers. The attributes of the table are logId, oldlast, newlast, changeDate and cid. The data types are serial, varchar(30), varchar(30), date and integer;

• create a trigger that records last name changes to customer rows.

• create a trigger that can check the constraint that the sum of the percent values of a book should always total 100. Fire the trigger whenever the percent value is changed.
NameChangeLog

create table NameChangeLog(logId serial primary key, oldlast varchar(30), newlast varchar(30) not null, changeDate Date, cid integer not null, foreign key (cid) references Customer(cid));
Log Last Name Changes

create or replace function LogLastNameChange() returns trigger AS $$
Declare
Begin
    insert into NameChangeLog (cid, oldlast, newlast, changeDate)
    values (NEW.cid, OLD.last, NEW.last, current_date);

    return NEW;
END;
$$ Language plpgsql;

create trigger LastNameChange before update of last on Customer
for each row execute procedure LogLastNameChange();
Percent Constraint

create or replace function CheckPercent() returns trigger AS $$
Declare
   pct integer;
Begin
   select sum(percent) into pct from Writes where booknum = NEW.booknum;
   if pct != 100 then
      raise exception 'The percent value for all authors of book % does not sum to 100', NEW.booknum;
      return null;
   end if;
   return NEW;
END;
$$
Language plpgsql;

create trigger CheckPercent after update of percent on Writes
for each row execute procedure CheckPercent();
Deferred Constraint

create constraint trigger CheckPercent after update of percent on Writes deferrable initially deferred for each row execute procedure CheckPercent();
transactions in psql

cs464lib3=# begin;
BEGIN
BEGIN
    cs464lib3=# update Writes set percent = 70 where booknum = 14 and aid = 10;
    UPDATE 1
    cs464lib3=# update Writes set percent = 20 where booknum = 14 and aid = 11;
    UPDATE 1
    cs464lib3=# commit;
ERROR:  The percent value for all authors of book 14 does not sum to 100
create or replace function ChangePercents(bid integer, numAids integer, 
aids integer array, pct integer array) 
returns void AS $$
declare
    i integer;
begin
    for i in 1..numAids loop
        update writes set percent = pct[i] where aid = aids[i] and booknum = bid;
    end loop;
end;
$$ language plpgsql;
Call ChangePercents

cs464lib3=# select ChangePercents(14, 2, Array[10, 11], Array[60,40]);
Call ChangePercents

cs464lib3=# select ChangePercents(14, 2, Array[10, 11], Array[70,20]);
ERROR: The percent value for all authors of book 14 does not sum to 100

cs464lib3=#
create or replace function addBookAndAuthors(bnum integer, name text, length integer,
aids integer array, firsts text array, lasts text array, pcts integer array)
returns void AS $$
Declare
    i integer;
Begin

    insert into book (booknum, title, pages) values (bnum, name, length);
    for i in 1..array_length(aids, 1) loop
        if not exists (select * from Author where aid = aids[i]) then
            insert into author (aid, first, last) values (aids[i], firsts[i], lasts[i]);
        end if;
        insert into writes (aid, booknum, percent) values (aids[i], bnum, pcts[i]);
    end loop;
end;
$$ language plpgsql;
Call addBookAndAuthor

select addBookAndAuthors(17, 'Tom Sawyer', 200, Array[2], array['Mark'], array['Twain'], array[100]);

select addBookAndAuthors(18, 'Ada', 700, Array[19], array['Vladimir'], array['Nabokov'], array[100]);

select addBookAndAuthors(19, 'Algebra', 610, Array[20, 21], array['Saunders', 'Garrett'], array['Mac Lane', 'Birkhoff'], array[50,50]);