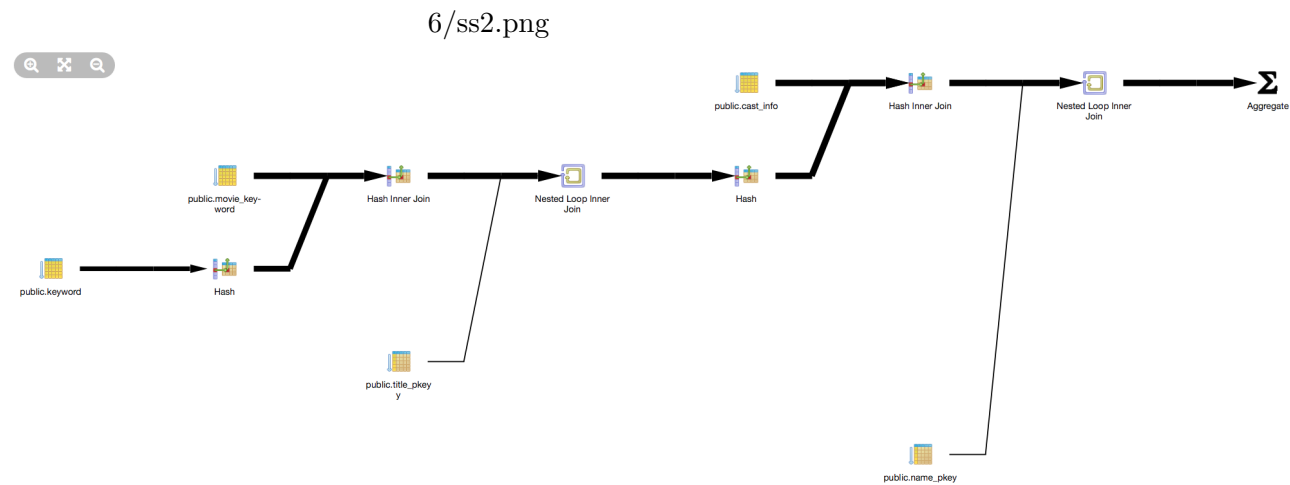


## Exercise 1

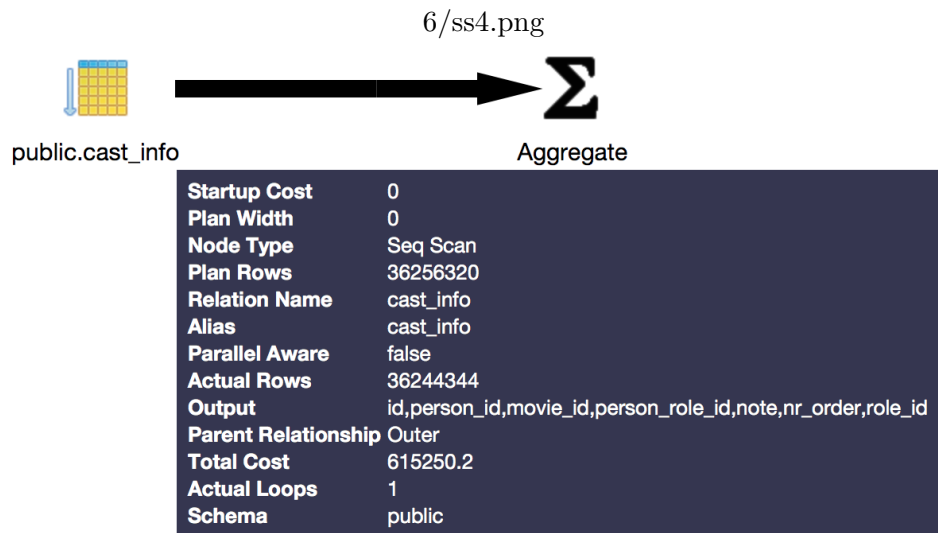
1.

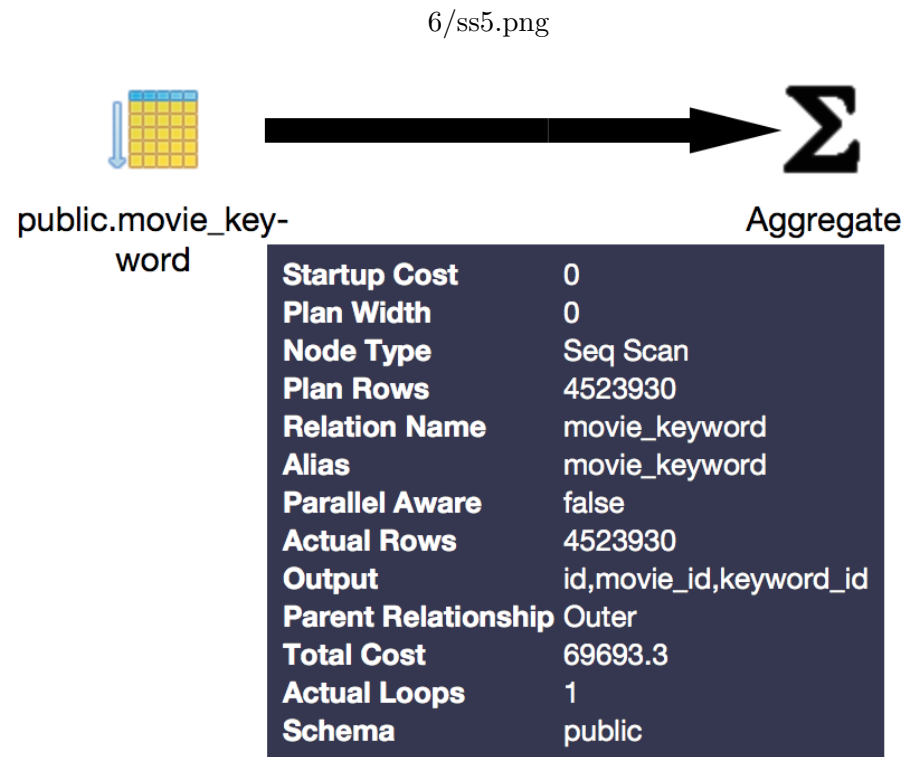


2.

	estimated card.	cardinality	q-error
cast_info	36256320	36244344	1.00033042396904741881
name	4167363	4167491	1.00003071486693143841
movie_keyword	4523930	4523930	1
keyword	134170	134170	1
title	2528754	2528312	1.000174820196241603093289

Screenshots:





3.

	estimated card.	cardinality	q-error
1.	414	2	1.207
2.	1	4167491	4167491
3.	4523930	4523930	1
4.	1	134170	134170
5.	1	2528312	2528312
6.	1	2528312	2528312

4.

5.

6.

## Exercise 2

1.

a)

`parent(X,Y) :- child(Y,X)`

b)

`married(X,Y) :- parent(X,Z), parent(Y,Z)`

c)

`sister(X,Y) :- parent(Z,X), parent(Z,Y), NOT male(X)`

d)

`halfbrother(X,Y) :- male(X), parent(A,X), parent(A,Y), parent(B,X), NOT  
parent(B,Y)`

2.

### Datalog program 1:

The predicates can be layered:

First layer (bottom layer): **t**  
no negative dependencies

Second layer: **s**  
no negative dependencies

Third layer: **r**  
depends on the negative predicate `s`  $\rightarrow$  `s` is in a lower layer  $\rightarrow$  stratified

Fourth layer: **p**

depends on the negative predicate  $r \rightarrow r$  is in a lower layer  $\rightarrow$  stratified

Fifth layer: **q**

depends on the negative predicate  $p \rightarrow p$  is in a lower layer  $\rightarrow$  stratified

Summary: Program 1 is stratified.

### **Datalog program 2:**

The predicates can not be layered:

First layer (bottom layer): **s** and **q**

no negative dependencies

Second layer: **t**

depends on the negative predicate  $t$  (itself)  $\rightarrow t$  is in the same layer  $\rightarrow$  **not stratified**

Third layer: **p**

depends on the negative predicate  $t \rightarrow t$  is in a lower layer  $\rightarrow$  would be stratified

Summary: Program 2 is **not** stratified because  $t$  depends on a negative predicate in the same layer (itself).