Ahsanullah University of Science and Technology

Distributed Database Lab

CSE 4126

Project name: National patient Management System.

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National Patient Management System

Project abstract:

A distributed database management system that will be operated nationwide in order to manage patients across the country. We want to create a common server where all data of the patients visiting different hospitals can be stored and be shared for future ease of operation, for example, if a patient is referred to a different hospital by his/her doctor, the doctor can make an access to all of the past surgical history and reports of that particular patient by requesting the server, even if that data is located at a different hospital.

User of the database:

Hospital authority

"Why we need distributed database management system for this project?" :

Storage devices in the different hospitals are not connected to a common processor, it can be stored dispersed over a network of interconnected computers (in addition to being geographically dispersed)

Tables of the database:

- Doctors (dr_id, dr_name, dr_age, dr_sex , dr_phn, dr_email, chamber, designation, degree, department, experience, time, Fee, day, primary key (dr_id))
- Reports (rep_id, rep_date, impression, primary key (rep_id))
- Medicine (med_id, med_name, med_generic_name, med_company, med_work, med_per_price, primary key (med_id))
- Diagnosis (dia_id, dia_name, dia_cost, dia_requirements, dia_hospital, rep_id, primary key (dia_id), foreign key(rep_id) references reports(rep_id))

- History (his_id, his_date, problem, rep_id, dr_id, med_id, primary key (his_id), foreign key(rep_id) references reports(rep_id), foreign key(dr_id) references doctors(dr_id), foreign key(med_id) references medicine(med_id))
- Surgical_history (s_his_id, s_date, s_name, s_hospital, s_cost, dr_id, primary key (s_his_id), foreign key(dr_id) references doctors(dr_id))
- Patient (pt_id, pt_name, pt_age, pt_sex, pt_phn, pt_house, pt_road, pt_block, pt_section, pt_district, bl_grp, weight, height, dia_id, his_id, s_his_id, primary key (pt_id), foreign key(dia_id) references diagnosis(dia_id), foreign key(his_id) references history(his_id), foreign key(s_his_id) references surgical_history(s_his_id))

<u>Functions and Procedures of the database:</u>

- Function1 (blood_group): This is a function which counts the patients of same blood group of given ID as parameter.
- Proc2 (same_bl_group): This is a procedure which gives the patients ID, corresponding number of patients of same blood group and corresponding blood group (fetched from the cursor) using function 1.
- Func3 (dr): This is a function which finds the doctor ID who hasn’t done any surgery till now (this works for only single ID).
- Func4 (rep): This is a function which counts the patients who have report impression as ‘normal report’.
- Proc5 (rep_date): This is a procedure which gives the patients’ ID and name whose reports were made on 21-05-2016.
- Proc6 (his): This is a procedure which shows the history date and problem of a patient.
- Proc7 (shis): This is a procedure which gives the patients’ name and phone number whose surgical cost was greater than 60 thousands.
- Proc8 (dd): This is a procedure which shows the name and designation of the doctor who operated on desired patient.

Fragmentation:

We have the dr_hospital_chamber as an attribute in doctors table.

So we fragment doctors table –

Doctors1 = SL $_{\text{dr\_hospital\_chamber = “Medinova”}}$ doctors

Doctors2 = SL $_{\text{dr\_hospital\_chamber = “Square hospital”}}$ doctors

Site allocation:

We have 2 sites in this project for example. Let the sites be “Square” and “Medinova”.

Site1: (Square hospital) Doctors1

Site2: (Medinova) Doctors2

Level 3 distribution transparency:

At the first evaluation, we had made sure that if we insert data into one site, all sites will be updated and that data will be inserted into all sites.

For the final project, we have implemented level 3 distribution transparency for fragments. If you want to change the chamber of a doctor in Doctors1 from “Square hospital” to “Medinova”, the following operations will be done by query:

- Perform an update operation on global relation “doctors”
- Effect of the update: (1) Insert into doctors2 in site2, (2) Delete from doctors1 in site1. When both operations are performed, the update is successful.

For example, I have written down a sample application for moving the doctor having id 9002 (at site1, Square hospital) from dr_hospital_chamber = “Square hospital” to “Medinova” (site2) so we can implement it in the project through code:

Select dr_name into $dr_name from doctors1 at site1

Where dr_id = 9002

IF #FOUND then,

Insert into doctors2 at site2: (9002, $name, “Medinova”);

Delete doctors1 at site1 where dr_id = 9002;

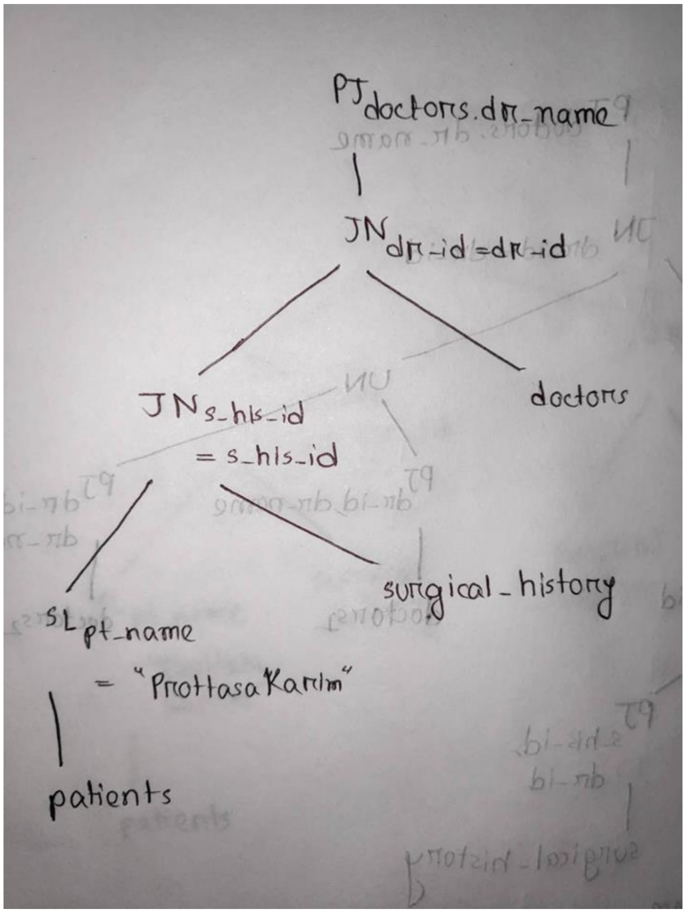
(assuming that fragmentation of doctors has only 3 attributes id, name and chamber, although our fragmentation in project has all the attributes from doctors table)

Operator tree:

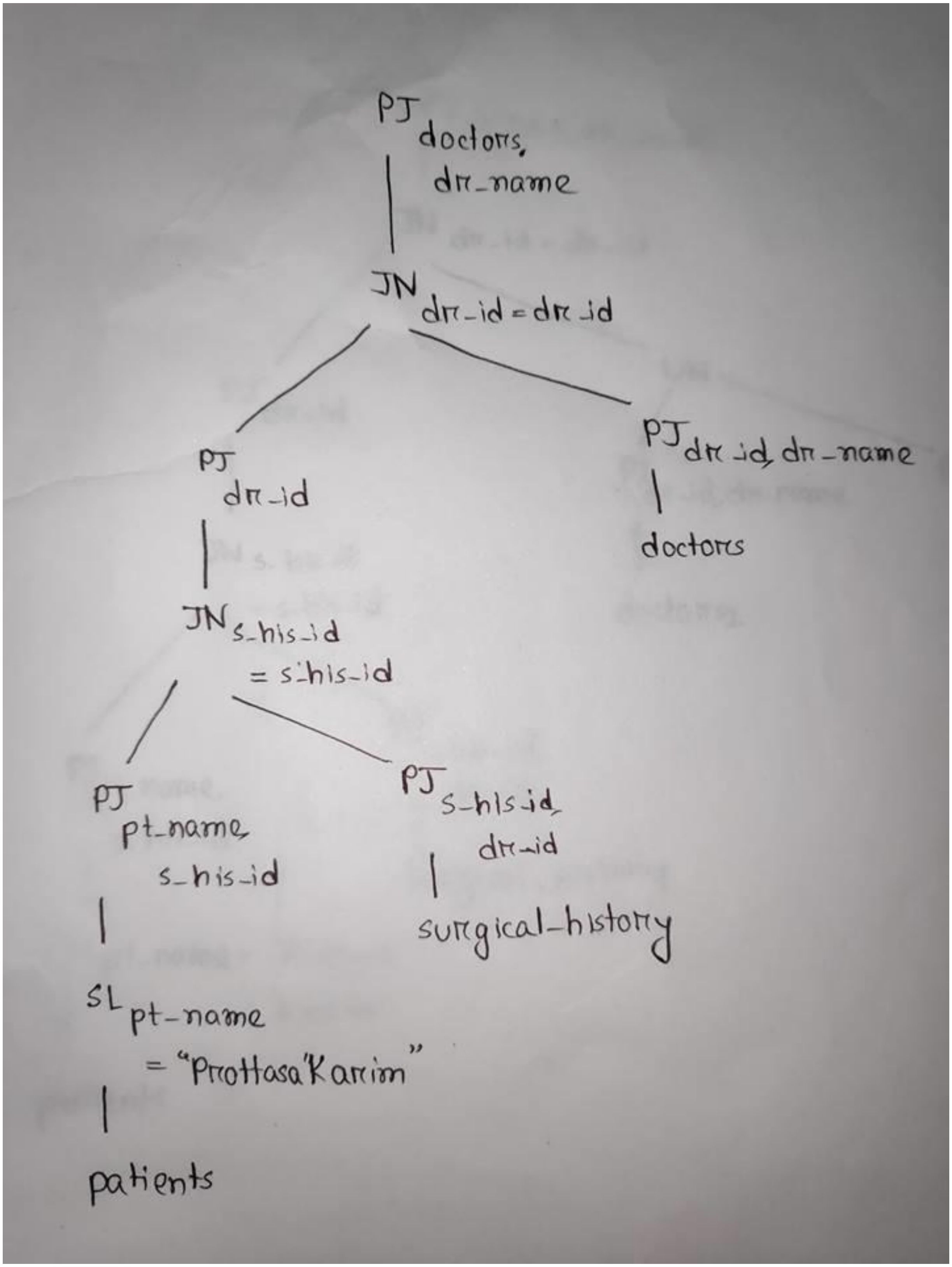
There is a patient named Prottasa Karim and we want to know which doctor did the surgery of the patient.

Input: $PJ_{\text{doctors.dr\_name}}$ (($SL_{\text{pt\_name=”Prottasa Karim”}}$ patients $JN_{\text{s\_his\_id=s\_his\_id}}$ surgical history) $JN_{\text{dr\_id=dr\_id}}$ doctors)

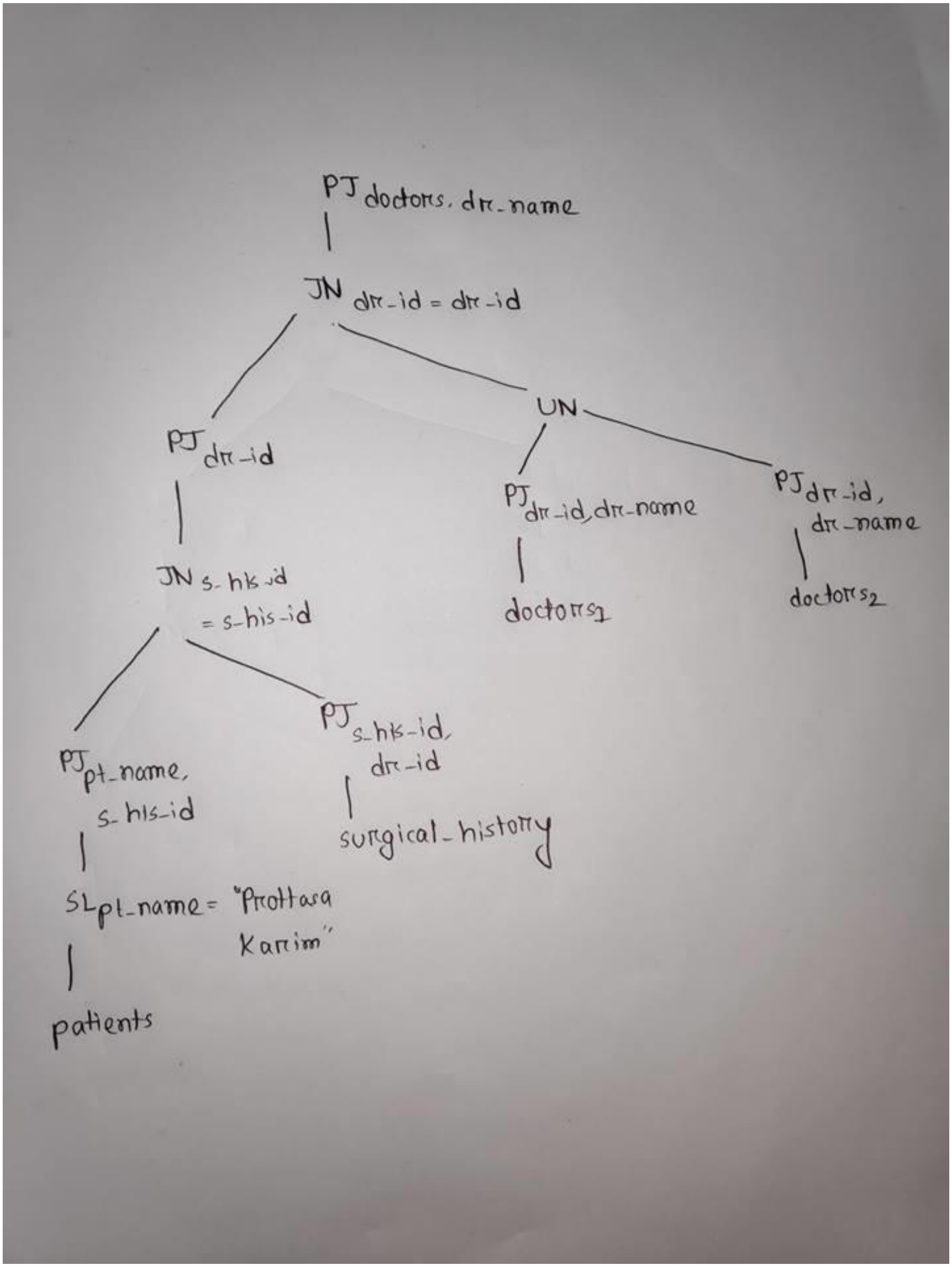
The basic operator tree from the given query:



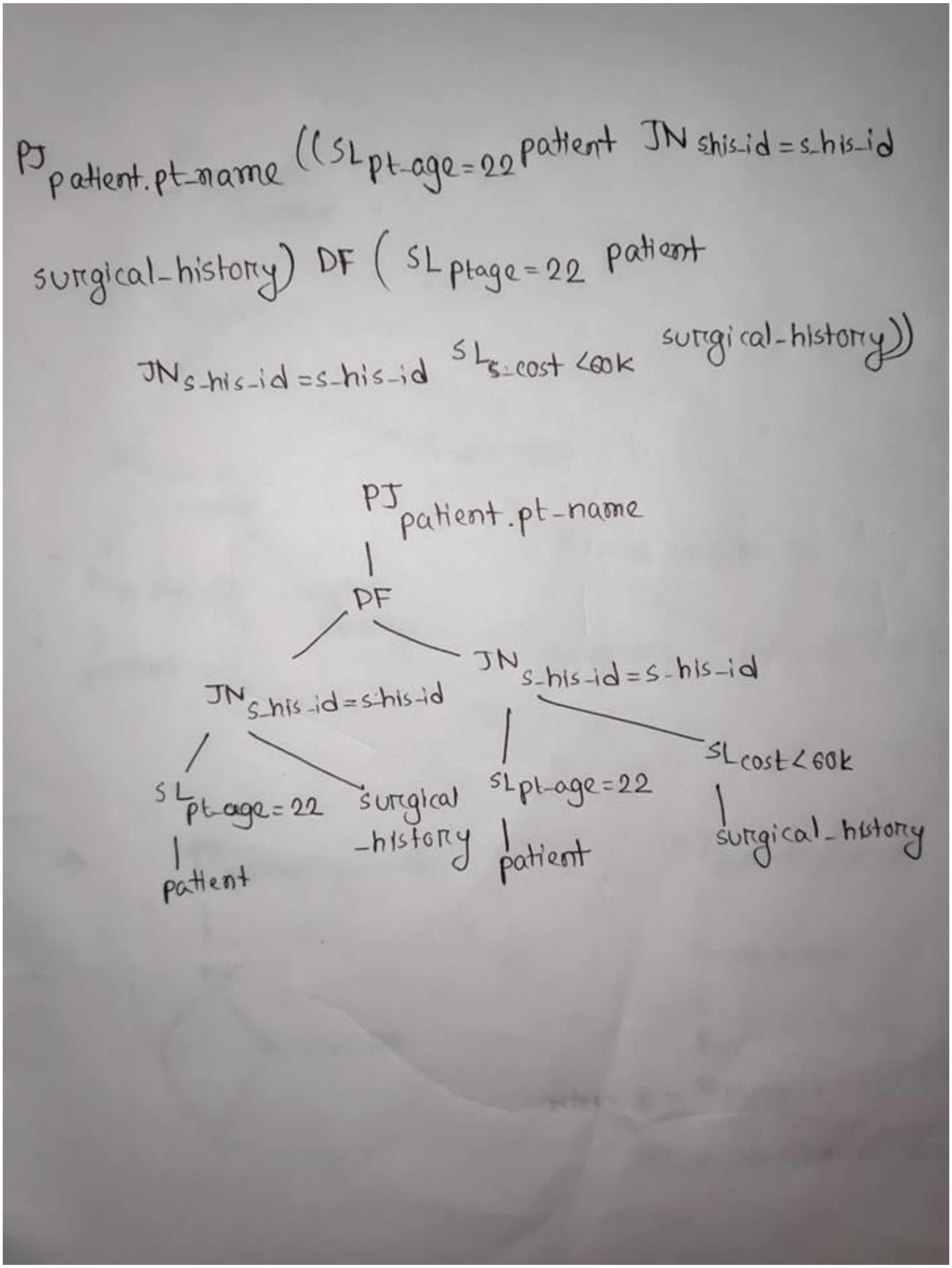
After applying cr-1:



After applying fragmentation:



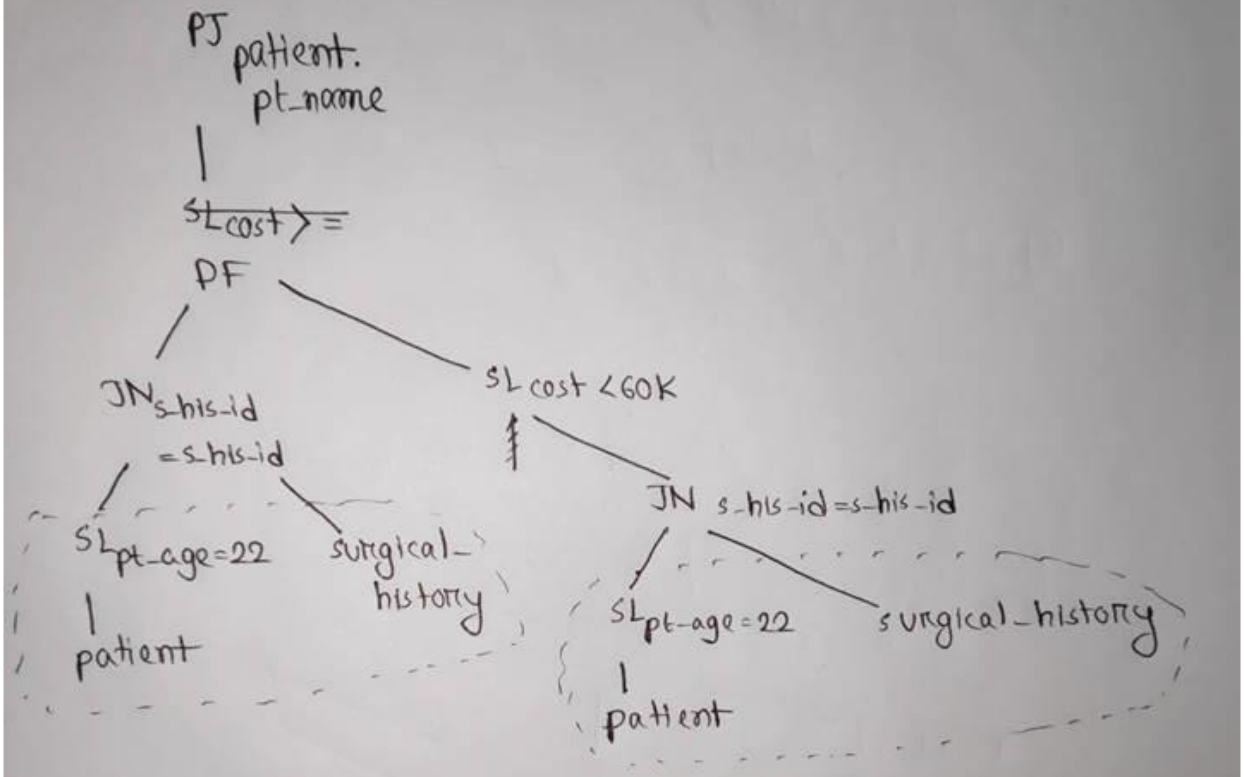
Operator tree 2:



$PJ_{patient.pt\_name}((SL_{pt\text{-}age=22}\ patient\ JN_{shis\_id=s\_his\_id}$

$surgical\text{-}history)\ DF\ (SL_{ptage=22}\ patient$

$JN_{s\text{-}his\text{-}id=s\text{-}his\text{-}id}\ SL_{s\_cost<60k}\ surgical\text{-}history))$



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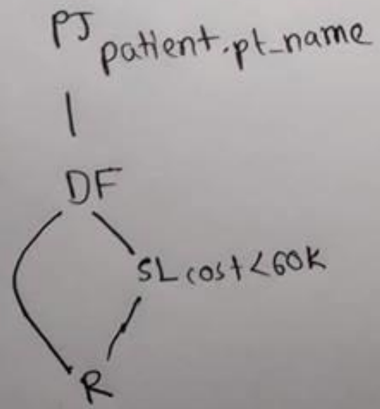

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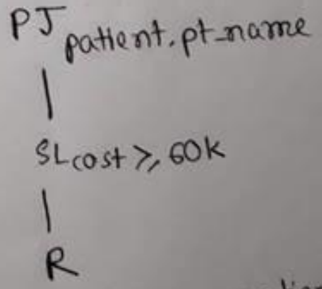

Where, R = $SL_{pt\text{-}age=22}$ patient $JN_{s\text{-}his\text{-}id=s\text{-}his\text{-}id}$ surgical-history

Output of operator tree 2: PJ$_{\text{patient.pt\_name}}$ SL$_{\text{cost >= 60k}}$ (SL$_{\text{pt\_age = 22}}$ patient JN$_{\text{s\_his\_id=s\_his\_id}}$ surgical history)

Conclusion:

We have worked this far on this project. We hope to keep developing this project into a complete one in the days to come.