

5.

Comanda SQL pentru prima varianta

```
select titlu, valoare
from (select o.cod_opera, o.titlu, valoare
      from colectie c natural join opera o
      where c.proprietar='VV' and o.cod_galerie='G1'
      intersect
      select *
      from (select cod_opera
            from restaureaza
            where data>to_date('15/06/2000', 'dd/mm/yyyy'))
      natural join
      (select cod_opera, titlu, valoare
       from opera))
```

Comanda SQL pentru varianta optimizata

```
select titlu, valoare
from (select *
      from (select cod_opera, titl, valoare, cod_colectie
            from opera
            where cod_galerie='G1')
      natural join
      (select *
       from colectie
       where proprietar='VV'))
natural join
(select cod_opera
 from restaureaza
 where data>to_date('15/06/2000', 'dd/mm/yyyy'))
```

1.

```
R1 = project(realizeaza, nr_frame, cod_salariat)
```

```
R2 = project(nr_frame)
```

$$R3 = \text{semijoin}(R1, R2)$$

```
R4 = project(R3, cod_salarial)
```

```
R5 = select(salariat, salariu>a)
```

```
R6 = semijoin(R5, R4)
```

```
R7 = project(publicatie,
cod_salariat)
```

```
R8 = select(salariat, salariu>a)
```

```
R9 = semijoin(R8, R7)
```

R10 = union(R9, R6)

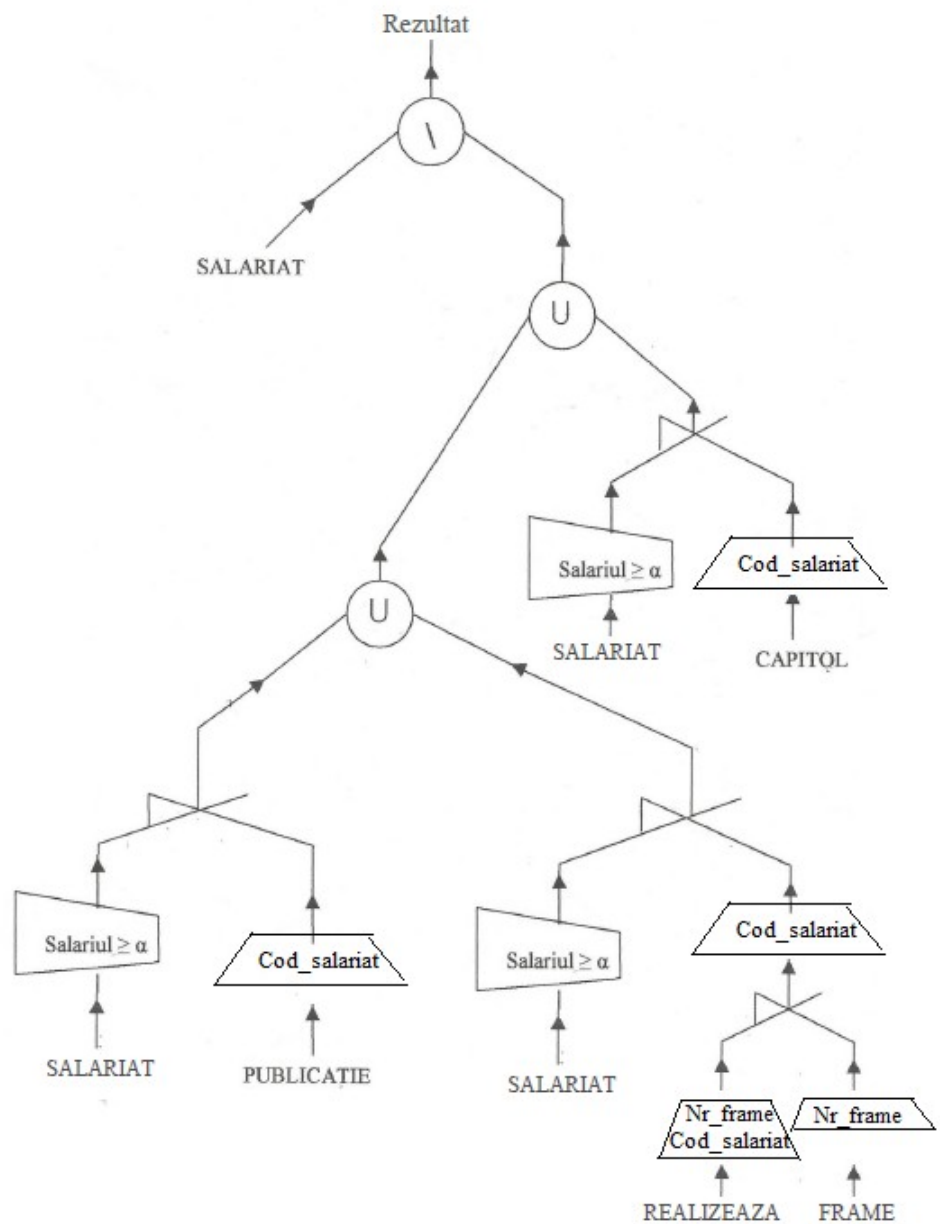
```
R11 = project(capitol,
cod_salarialat)
```

```
R12 = select(salariat, salariu>a)
```

R13 = semijoin(R12, R11)

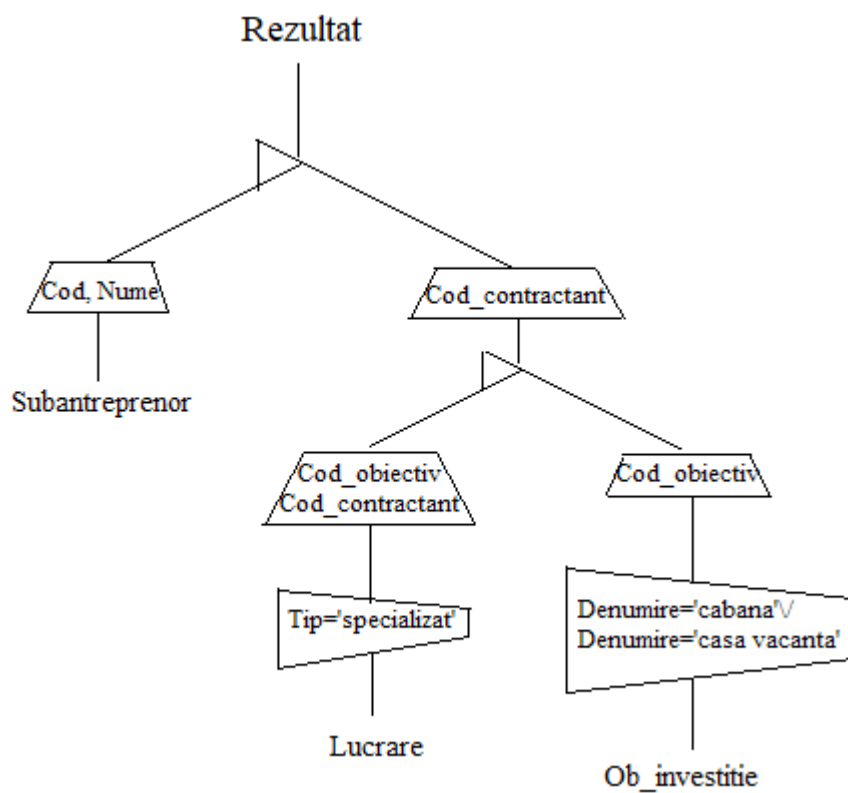
```
R14 = union(R13, R10)
```

```
R15 = minus(salariat, R14)
```

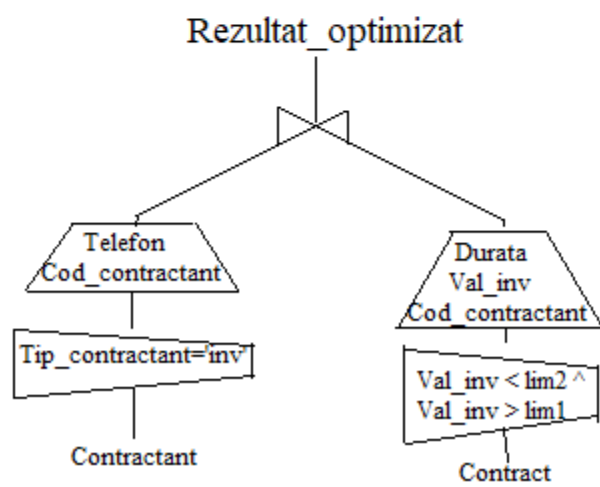
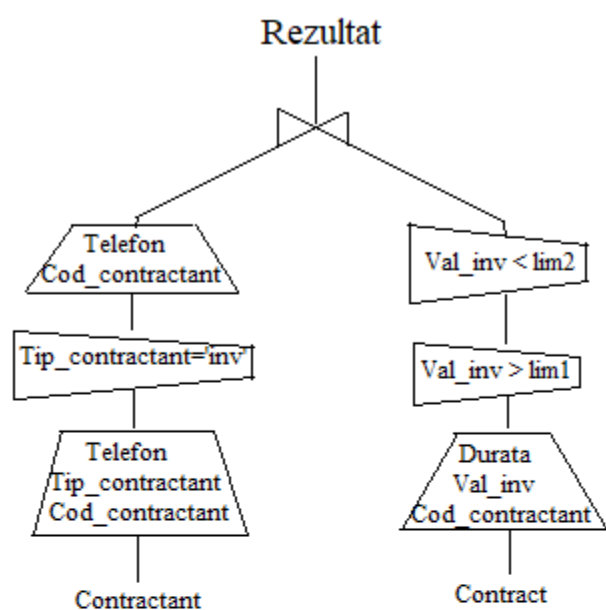


2.

Reultat = Semijoin(Project(Subantreprenor, Cod, Nume), Project(Semijoin(Project(Select(Lucrare, tip='specializat'), Cod_obiectiv, Cod_contractant), Project(Select(Ob_investitie, denumire='cabana' ∨ denumire='casa vacanta'), Cod_obiectiv)), Cod_contractant))



3.



4.

