Ministerul Educației și Cercetării al Republicii Moldova

Universitatea Tehnică a Moldovei

Facultatea Calculatoare, Informatică și Microelectronică

Departamentul Ingineria Software și Automatică

**Lucrare individuală**

la disciplina **”Baze de Date”**

Tema: **Expresii ale Algebrei Relaționale**

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Verificat de:

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**Lucrare individuală** la disciplina **”Baze de Date”**

Tema: **Expresii ale Algebrei Relaționale**

**Sarcina / Задание:**

Fie relaţiile ***r*** şi ***s*** definite pe schemele respective ***R=ABC*** şi ***S=ABC***:

Пусть заданы отношения ***r*** и ***s,*** определенные на схемах ***R=ABC* и *S=ABC,*** соответственно:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***r*** | ***A*** | ***B*** | ***C*** |  |  |  | ***s*** | ***A*** | ***B*** | ***C*** |
|  | *a1* | *b3* | *c2* |  |  |  |  | *a2* | *b1* | *c3* |
|  | *a2* | *b1* | *c2* |  |  |  |  | *a2* | *b2* | *c2* |
|  | *a1* | *b1* | *c1* |  |  |  |  | *a2* | *b1* | *c2* |
|  | *a2* | *b2* | *c2* |  |  |  |  | *a2* | *b2* | *c1* |
|  | *a1* | *b2* | *c2* |  |  |  |  | *a1* | *b2* | *c1* |
|  | *a1* | *b2* | *c1* |  |  |  |
|  | *a2* | *b1* | *c1* |  |  |  |

Să se găsească relaţia reprezentată de expresia algebrei relaţionale:

s ***(C≠c3) &(A≠a1) (s\~r)*** ⊳⊲O p***S(r\~s).***

***Rezolvare/Решение***

Divizam expresia dată în părți și le rezolvăm pe fiecare aparte:

Разделяем выражение на части и решаем каждую часть отдельно:

1. ***q1=~s***
2. ***q2= ~r***
3. ***q3= s\~r***
4. ***q4= r\~s***
5. ***q5=*** p***S(r\~s).***

***6. q6=*** s ***(C≠c3) &(A≠a1) (s\~r)***

***REZ=*** s ***(C=c3) & (A=a1) ( ~s\~r)*** ⊳⊲O p***S( ~s***Ç ***r).***

1. Operația ***q1*** se calculează după formula

Pentru a calcula ***atup(S)***, identificăm domeniile active ale atributelor relației ***s(ABC)***

***adom(A)****={a1,a2 }*

***adom(B)****={ b1,b2}*

***adom(C)****={c1,c2,c3 }*

Formăm relația ***atup(R)*** din valorile domeniilor active /

***atup(S)=adom(A)×adom(B) ×adom(C)***

|  |  |  |  |
| --- | --- | --- | --- |
| ***atup(S)*** | ***A*** | ***B*** | ***C*** |
|  | *a1* | *b1* | *c1* |
|  | *a1* | *b1* | *c2* |
|  | *a1* | *b1* | *c3* |
|  | *a1* | *b2* | *c1* |
|  | *a1* | *b2* | *c2* |
|  | *a1* | *b2* | *c3* |
|  | *a2* | *b1* | *c1* |
|  | *a2* | *b1* | *c2* |
|  | *a2* | *b1* | *c3* |
|  | *a2* | *b2* | *c1* |
|  | *a2* | *b2* | *c2* |
|  | *a2* | *b2* | *c3* |

Calculăm / Вычисляем

***q1= ~s***

|  |  |  |  |
| --- | --- | --- | --- |
| ***~s*** | ***A*** | ***B*** | ***C*** |
|  | *a1* | *b1* | *c1* |
|  | *a1* | *b1* | *c2* |
|  | *a1* | *b1* | *c3* |
|  | *a1* | *b2* | *c2* |
|  | *a1* | *b2* | *c3* |
|  | *a2* | *b1* | *c1* |
|  | *a2* | *b2* | *c3* |

1. Operația ***q2*** se calculează după formula

Pentru a calcula ***atup(r)***, identificăm domeniile active ale atributelor relației ***r(ABC)***

***adom(A)****={a1,a2 }*

***adom(B)****={ b1,b2,b3}*

***adom(C)****={c1,c2 }*

Formăm relația ***atup(R)*** din valorile domeniilor active /

***atup(R)=adom(A)×adom(B) ×adom(C)***

|  |  |  |  |
| --- | --- | --- | --- |
| ***atup(R)*** | ***A*** | ***B*** | ***C*** |
|  | *a1* | *b1* | *c1* |
|  | *a1* | *b2* | *c1* |
|  | *a1* | *b3* | *c1* |
|  | *a1* | *b1* | *c2* |
|  | *a1* | *b2* | *c2* |
|  | *a1* | *b3* | *c2* |
|  | *a2* | *b1* | *c1* |
|  | *a2* | *b2* | *c1* |
|  | *a2* | *b3* | *c1* |
|  | *a2* | *b1* | *c2* |
|  | *a2* | *b2* | *c2* |
|  | *a2* | *b3* | *c2* |

Calculăm / Вычисляем

***q2=~r***

|  |  |  |  |
| --- | --- | --- | --- |
| ***~r*** | ***A*** | ***B*** | ***C*** |
|  | *a1* | *b3* | *c1* |
|  | *a1* | *b1* | *c2* |
|  | *a2* | *b2* | *c1* |
|  | *a2* | *b3* | *c1* |
|  | *a2* | *b3* | *c2* |

1. Calculăm / Вычисляем

***q3=s\~r***

|  |  |  |  |
| --- | --- | --- | --- |
| ***s\~r*** | ***A*** | ***B*** | ***C*** |
|  | *a2* | *b1* | *c3* |
|  | *a2* | *b2* | *c2* |
|  | *a2* | *b1* | *c2* |
|  | *a1* | *b2* | *c1* |

1. Calculăm / Вычисляем

***q4= r\~s***

|  |  |  |  |
| --- | --- | --- | --- |
| ***r\~s*** | ***A*** | ***B*** | ***C*** |
|  | *a1* | *b3* | *c2* |
|  | *a2* | *b1* | *c2* |
|  | *a2* | *b2* | *c2* |
|  | *a1* | *b2* | *c1* |

1. Calculăm / Вычисляем

***q5=*** p***S(r\~s).***

|  |  |  |  |
| --- | --- | --- | --- |
| p***S(r\~s).*** | ***A*** | ***B*** | ***C*** |
|  | *a1* | *b3* | *c2* |
|  | *a2* | *b1* | *c2* |
|  | *a2* | *b2* | *c2* |
|  | *a1* | *b2* | *c1* |

1. Calculăm / Вычисляем

***q6=*** s ***(C≠c3) &(A≠a1) (s\~r)***

|  |  |  |  |
| --- | --- | --- | --- |
| s ***(C≠c3) &(A≠a1) (s\~r)*** | ***A*** | ***B*** | ***C*** |
|  | *a2* | *b1* | *c3* |
|  | *a2* | *b2* | *c2* |
|  | *a2* | *b1* | *c2* |
|  | *a1* | *b2* | *c1* |

***8)*** Calculăm / Вычисляем

***qn= REZ***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***REZ*** | ***Aq6*** | ***Bq6*** | ***Cq6*** | ***Aq5*** | | ***Bq5*** | ***Cq5*** |
|  | *NULL* | *NULL* | *NULL* | | *a1* | *b3* | *c2* |
|  | *a2* | *b1* | *c2* | | *a2* | *b1* | *c2* |
|  | *a2* | *b2* | *c2* | | *a2* | *b2* | *c2* |
|  | *a1* | *b2* | *c1* | | *a1* | *b2* | *c1* |