

TRC> { B.Name | B in Bank and (exists A in Account, C in Customer) ( C.C# = A.C# and A.B# = B.B# and C.Name = 'Wojcicki')};

Name  
England  
America

2)  
ALG> t1 := select Name='Royal' (Bank);  
t2 := project C# (t1 njoin Account);  
t3 := t2 njoin Customer;  
project Name (t3);

TRC> { C.Name | C in Customer and (exists A in Account, B in Bank) ( C.C# = A.C# and A.B# = B.B# and B.Name = 'Royal') };

Name  
Adams  
Blake

3)  
ALG> t1 := (select Balance < 3000 (Account)) njoin Customer;  
project Name (t1);

TRC> { C.Name | C in Customer and (exists A in Account) ( C.C# = A.C# and A.Balance < 3000)};

Name  
Adams  
Blake

4)  
ALG> t1 := select Name='Royal' or Name='America' (Bank);  
t2 := project C# (t1 njoin Account);  
t3 := (t2 njoin Customer);  
project Name (t3);

TRC> { C.Name | C in Customer and (exists A in Account, B in Bank) ( C.C# = A.C# and A.B# = B.B# and (B.name = 'Royal' or B.Name = 'America')) };

Name  
Adams  
Blake

Clark  
Wojcicki

5)

```
ALG> t1 := rename Name to cname (Customer);  
t2 := rename Name to bname (Bank);  
t3 := (t1 njoin Account) njoin t2;  
project cname, bname (t3);
```

```
TRC> { C.Name, B.Name | C in Customer and B in Bank and (exists A in Account)( A.C# =  
C.C# and B.B# = A.B#)};
```

```
cname, bname  
Adams England  
Adams America  
Adams Royal  
Adams France  
Blake England  
Blake America  
Blake Royal  
Clark England  
Clark America  
Wojcicki England  
Wojcicki America
```

6)

```
ALG> t1 := project Name (Customer);  
t2 := project Name (Customer njoin Account);  
t1 minus t2;
```

```
TRC> { C.Name | C in Customer and not (exists A in Account) (A.C# = C.C#) };
```

```
Name  
Smith
```

7)

```
ALG> t1 := project C#,B# (Account);  
t2 := project B# (Bank);  
t3 := t1 divideby t2;  
project Name (t3 njoin Customer);
```

```
TRC> { C.Name | C in Customer and (forall B in Bank)(exists A in Account) (B.B# = A.B# and A.C# = C.C#) };
```

Name  
Adams

8)

```
ALG> t1 := project C#,B# (Account);  
t2 := project B# (select Name != 'France' (Bank));  
t3 := t1 divideby t2;  
t4 := project C# (select Name = 'France' (Bank njoin Account));  
t5 := t3 minus t4;  
project Name (Customer njoin t5);
```

```
TRC> { C.Name | C in Customer and (forall B in Bank)  
(( B.Name = 'France' and not (exists A in Account)(A.B# = B.B# and C.C# = A.C#)) or  
( B.Name != 'France' and (exists A in Account)(A.B# = B.B# and C.C# = A.C#)))};
```

Name  
Blake

9)

```
ALG> t1 := project C# (select Name='Clark' (Customer));  
t2 := ((project C#,B# Account) / t1);  
t3 := ((project C#,B# Account) / t2);  
t4 := select Name !='Clark' (t3 njoin Customer);  
project Name (t4);
```

```
TRC> { C.Name | C in Customer and C.Name != 'Clark' and (exists C1 in Customer)(C1.Name  
= 'Clark' and (forall B in Bank)  
(((exists A in Account)(A.B# = B.B# and C1.C# = A.C# ) and  
(exists A1 in Account)(A1.C# = B.B# and A1.C# = C.C#))  
or  
not (exists A in Account)( C1.C# = A.C# and A.B# = B.B#)))};
```

Name  
Adams  
Blake  
Wojcicki

10)

```
ALG> t1 := project C#,B# (Account);  
t2 := project B# ((select Name='Clark' (Customer)) njoin t1);
```

```

t3 := t1 divideby t2;
t4 := (project B# Bank) minus t2;
t5 := (t4 njoin Account) njoin Customer;
t6 := project Name (t5);
t7 := project Name (select Name != 'Clark' (t3 njoin Customer))
t7 minus t6;

```

```

TRC> { C.Name | C in Customer and C.Name != 'Clark' and
(exists C1 in Customer)(C1.Name = 'Clark' and (forall B in Bank)
(((exists A in Account)(A.C# = C1.C# and A.B# = B.B#) and
(exists A1 in Account)(A1.C# = C.C# and A1.B# = B.B#))
or
(not (exists A in Account)(A.C# = C1.C# and A.B# = B.B#) and
not (exists A1 in Account)(A1.C# = C.C# and A1.B# = B.B#)))));

```

```

Name
Wojcicki

```

```

11)
ALG> Aggregate Name, count(B#), sum(Balance) (Customer njoin Account);

```

```

TRC> { C.Name, count(A.b#), sum(A.Balance) | C in Customer and A in Account and C.C# =
A.C# };

```

Name	Count(B#)	Sum(Balance)
Adams	4	10000
Blake	3	9000
Clark	2	7000
Kuang	2	9000

```

12)
ALG> t1(Name, count) := aggregate Name; count(B#) (Customer njoin Account);
t2 := select count > 2 (t1);
project Name (t2);

```

```

TRC> { C.Name | C in Customer and (exists A in Account)(count(A.B#) > 2 and A.C# = C.C#)};

```

```

Name
Adams
Blake

```