

## Unit 6 Discussion Example - Set Theory as a Framework for Relational Databases

### Post 1 Initial Response

I searched CNN, Facebook, ESPN, and of course, my favorite recipe sites. Here are some of the advertisements that came up: Online advertisement companies  $A = \{\text{Toyota, Liberty Mutual, Smashburger}\}$  Online retailers I have purchased from  $B = \{\text{Amazon, Barnes \& Noble, Smashburger, Target}\}$ .

I will use a needlessly complicated and inefficient algorithm to determine whether  $A \subseteq B$  so as to discourage people from copying this.

```
Find number of elements in A.
m=|A|
Find number of elements in B.
n=|B|
Initialize an empty  $m \times n$  array, C.
Set a variable count=m*n.
While (count>0)
    Get random number  $r$  between 1 and  $m$ .
    Get random number  $s$  between 1 and  $n$ .
    If  $A[r-1]=B[s-1]$ 
         $C[r-1,s-1]=1$ 
    Else
         $C[r-1,s-1]=0$ 
    Find the number of blank cells in C.
    Set count=number of blank cells in C.
End (While)
Make a new variable  $d = 0$ 
For i=0 to m-1
    For j=0 to n-1
         $d=d+C(i,j)$ 
    End for
End for
If  $d==m$ 
    Output "A is a subset of B."
Else
    Output "A is not a subset of B."
```

Based on this algorithm, I found that A is not a subset of B.

$$C = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix} \text{ so } d = 1. 1 \neq 3 \text{ so } d \neq m.$$

There is a common member, so the two sets are overlapping.