

Assignment #3: Connectivity

Worth: 10%

Note: You may do this assignment individually or in groups of two. But, if you do it in groups please follow these three rules:

1. Your group of two must not also work together on the project;
2. Your group of two must not have worked together on another assignment; and
3. Your group of two must combine data collected individually and fully synthesize your individual work into a single, joint work.

Objective

Examine the problem of revealing relationships amongst multiple sets of objects

The problem

The sets X and Y are said to be disjoint if they do not have a member in common. That is, two sets are said to be disjoint if the intersection of them is the empty set; that is, $X \text{ AND } Y = \emptyset$.

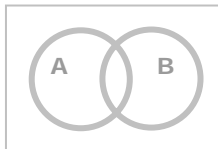
Now, consider the sets,

A = {x, y, z} and
B = {m, n, x, y}

and the disjoint subsets of A and B:

A NOT B	~ Items in A but not B, {z}
B NOT A	~ Items in B but on A, {m, n}
A AND B	~ Items in both A and B, {x, y}

These cases are easily located in this Venn diagram:



A Venn diagram also works well when N is 3 but what happens when N is 4 or even larger?
(Note: For N sets, there are $2^N - 1$ disjoint subsets.)

Explore several solutions for revealing the disjoint subsets amongst the four sets. Select two of these solutions and fully elaborate a computerized design for them. In other words, your design should include an outline for how a working system would be implemented in SVG or similar system. One representation should be textual in nature and the other should be graphical.

Briefly discuss:

- The fundamental difficulty of this problem;
- The differences between the two representations;
- How your representations might be applied to Boolean search systems.

What to hand in?

1. The two designs
2. A discussion section
3. An appendix that includes your rough sketches. Where appropriate, please annotate your sketches.