

Graph Theory

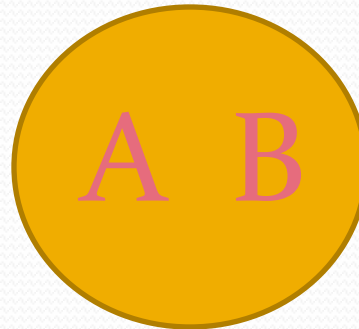
Scheduling

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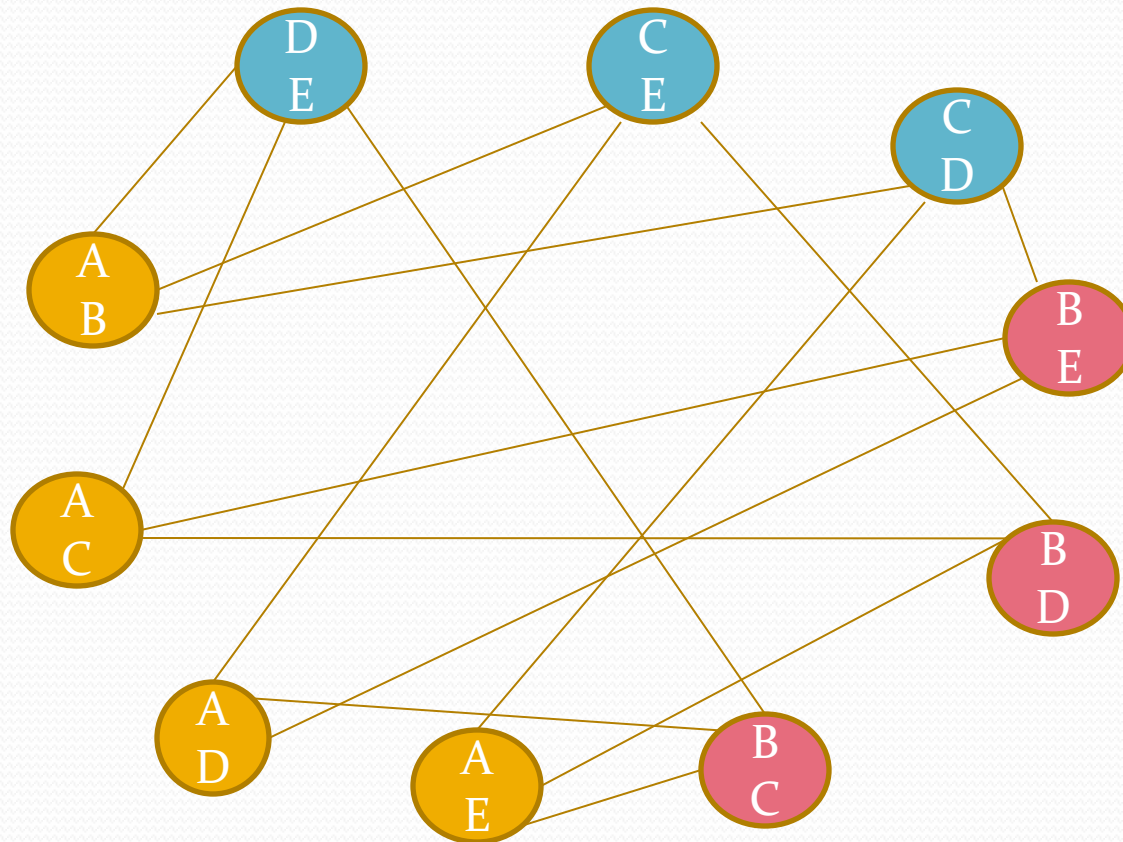
- Create a graph from provided information
- Color in the fewest number of colors possible
- Similar to Map Theory

Eccentric Pete

- He has 5 cats: Albert, Bertha, Cletus, Duddly, and Eunice. Pete has made ID tokens, one for each pair of cats. The token for Albert and Bertha, for example is shown below. Pete wishes to keep these in buckets, with the condition that no bucket contains two tokens that have completely different letters.



Eccentric Pete Graph



Zoo Problem

- There are 8 different animals in the zoo.
 - Amanda the Tiger
 - Candy the Oryx ←
 - Debbie the Zebra
 - Peter the Giraffe
 - Kanga the Elephant
 - Maribelle the Panda
 - Stefan the Rhino
 - Winifred the American Bald Eagle



Zoo Problem

- One of the zoo planners thinks that he has found a way to place these 8 animals into 5 new habitats with no conflicts. With each new multi-species habitat costing \$2 million, can the number of habitats be reduced?
- The resident zoologist has provided the following list of the eight animals and their conflicts.

Zoo Problem

Animals	Conflicts
Tiger	Oryx, Zebra, Giraffe, Panda
Oryx	Elephant, Tiger
Zebra	Tiger, Eagle
Giraffe	Tiger, Elephant, Eagle, Rhino, Panda
Elephant	Giraffe, Panda, Oryx
Panda	Tiger, Elephant, Giraffe
Rhino	Giraffe
Eagle	Giraffe, Zebra

Scheduling Classes

- Our math department has 10 classes that need to be scheduled in the spring. Below is a list of classes that cannot be scheduled at the same time due to teacher or enrollment constraints.

Class

- A: Discrete
- B: Math 1
- C: AFM
- D: Precalc
- E: AP Stats
- F: AP Calc
- G: Math 2
- H: Foundations of Alg
- I: Algebra 2
- J: Foundations of Geo

Cannot be scheduled with:

- D I
- D I J
- E F I
- A B F
- C H I
- I C D
- J
- E I J
- A B C E F H
- B G H

Scheduling Classes

- 1.) Represent the data in some type of graph or display.
- 2.) Find the minimum number of time slots needed to schedule all of the classes. Use any method that your group can agree upon.
- 3.) Write a description of the method you used by detailing what you did at each step. This will help when defending your solution to the class.
- 4.) Find a schedule of classes to represent your findings. (Which classes can be put together in your number of time slots?)
- Is this solution unique? Why or why not? If not can you find another one?

Your Turn

- Create your scheduling problem.
- You need to have 10 items.
- Tell me the minimum number of colors needed in context (minimum number of time slots, animal pens...)