University of Mila - Institute of Mathematics and Computer Science
Computer Science Department - 2nd Year Computer Science - Graph Theory
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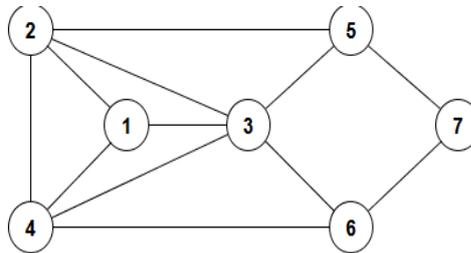
Graph Coloring

Exercise 1:

1. Find the maximum stable and maximum clique of this graph.

2. Is the following graph Eulerian? Justify your answer by giving a condition to say for sure if a graph is Eulerian or not.

3. Let G be a non-Eulerian graph. How to make G Eulerian by adding a vertex and some edges?

Exercise 2:

Consider the Graph of Exercise 1, let's find the limits of a chromatic number: $? \leq \gamma (G) \leq ?$:

1. Find a lower bound on the chromatic number of this graph. (How many colors are needed, at a minimum, to color this graph)?

2. Find a higher bound on the chromatic number of this graph. (How many colors are needed, at a maximum, to color this graph)?

3. Deduce the chromatic number.

Exercise 3:

Consider a class of 14 students:

To form student groups, it's important to ensure that the members of each group can work together without significant conflict. We know which members each student does not get along with:

1	2	3	4	5	6	7
3;5; 9;12	5;6;7; 8;12	1;4;5; 10;11	3;10 14	1;2;3;7; 8;9;11	2;8; 12;13	2;5; 9;12
8	9	10	11	12	13	14
2;5;6; 11;13;14	1;5; 7;12	3;4; 11;14	3;5;8; 10;14	1;2;6; 7;9	6;8; 14;	4;8;10; 11;13

- How to form groups?